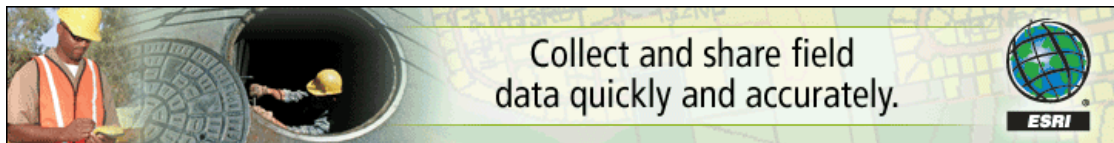




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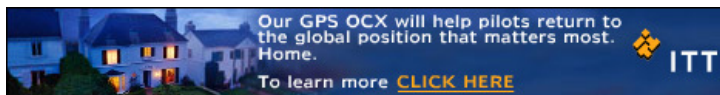
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Military & Government newsletter, February 2009

Feb 9, 2009

By: [Don Jewell](#)

GeoIntelligence

The *Wall Street Journal* ran a disturbing article by Yochi Dreazen Saturday morning, February 7, on page one. The article was titled simply "The Bomb Squad." The most disturbing part is that since the conflicts began more than six years ago in Iraq and Afghanistan, improvised explosive devices or IEDs have proved to be deadly devices for our warfighters, according to the *Journal*.

"... IEDs — the military's antiseptic term for buried bombs — are the top killer of U.S. forces in both Afghanistan and Iraq. They have killed more than 2,000 U.S. troops in the two countries, and they're gaining popularity. Last year, attacks rose 33% in Afghanistan...In the coming months, as the U.S. ramps up its war effort in Afghanistan, bomb-clearing personnel will become increasingly important...[as the U.S.] is planning to deploy tens of thousands of Americans to the country this year. They will be housed at dozens of new bases in areas that must be cleared of IEDs for the first time."

Hardly a day goes by without someone in theater being killed or injured by an IED, much less a suicide bomber. Bombs, while effective, are very much a cowardly way of taking a life and, while that is certainly a personal and subjective opinion, the fact remains that cowardly act or not our warfighters are being killed almost daily by IEDs and something must be done.

This has led me to extended conversations with several EOD or Explosive Ordnance Personnel from both the Marines and the Army in the past several months and, while I am excited by what I hear about new technologies and methodologies concerning defeating IEDs, there is not a single thing I can write about because it is all classified or at a minimum FOUO, For Official Use Only, and that is exactly as it should be.

However, there has been a recurring theme in all my conversations. It is clear that an accurate initial report of the location of the IEDs saves time, resources, and lives, but with our antiquated government-issue GPS, Military User Equipment (MUE), that is not always possible. Indeed, the PLGR and DAGR are no help in coordinating the exact coordinates for an IED, as they have no inherent communications capabilities unless they are hooked, via cables, to tactical military radios. They are not a handheld computer with the capability for add-on applications. They do not have a camera or a rangefinder, and cannot determine the position of the IED without the operators with the GPS devices putting themselves in harm's way by getting close to the device, which in many cases is not a wise choice because many IEDs can be remotely detonated by the enemy.

I hope you get the picture. Over the last two years I have been writing about devices that can accomplish what our MUE cannot and thankfully thousands of these more capable devices are now in the field with our troops, officially and unofficially. The bottom line is

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they work and they save, time, resources and lives. The sad truth is that it has become abundantly clear that if we don't give our warfighters the tools to do their jobs, they will find them on their own, and they have.

One of the devices that does a superb job of locating, photographing, and communicating the location of IEDs is the Trimble TDS Nomad, which I first reviewed in February 2008. You can review the Nomad's specifications in my article. That was exactly a year ago and there are, at a minimum, now several hundred, if not thousands, of Tripod Data Systems (A Trimble Company) Nomad's in various configurations in theater. Exact numbers are hard to determine because of the waiver process for using civilian GPS equipment in a war zone.

For those of you who don't want to go back and read those stirring 3,000 words in my original review of the Nomad, here is an executive summary of the original Nomad's capabilities:

The basic Trimble Nomad packs an amazing amount of functionality into a powerful, full-featured, and rugged GPS-enabled handheld computer. The Nomad features Windows Mobile 6, an 806 MHz processor, up to 1 GB of Flash storage, a long-life Lithium Ion battery that really is good for up to eight hours, and integrated wireless capabilities such as GPS, 802.11g, and Bluetooth. The Nomad handheld also features a high-resolution, sunlight-visible VGA display that shows graphics and maps in crisp detail. There are few displays as good as the Nomad's in all conditions. The 802.11g and Bluetooth capabilities can be disabled in theater if the Department of Defense (DoD) or local regulations require it.

The Nomad makes it easy to collect, save, and transmit data and embedded metadata in the field because it's available with so many built-in capabilities. Plus you can use the Nomad's CompactFlash (CF), Secure Digital (SDIO), and interface slots to add even more devices, capabilities, and storage.

The Nomad's rugged MILSPEC construction makes it ideal for forestry, public safety, field service, utilities, military, and other outdoor or service-related applications.

Now that you know what the basic Nomad is capable of, let's see what the new version is all about.

Recently, Ken Wineberg at Trimble TDS sent me the newest version of the Nomad 800X that has numerous additional capabilities over the original version. The 800X series of handheld GPS computers includes three new models of the militarily rugged device that offers increased Wireless Wide Area Network (WWAN) functionality, integrated quad-band GSM cellular data transmission capability, digital photography, barcode scanning and more in one device.

Note: For those of you who are not aware, GSM (or Global System for Mobile communications, originally from *Groupe Spécial Mobile*) is the true standard for mobile phones and mobile devices in the world today. It is estimated that 80% of the global mobile market uses the GSM standard, which means that GSM is used by more than 3 billion people across more than 212 countries and territories. The bottom line being that wherever you travel with your Nomad you will more than likely have connectivity. With that bit of esoteric knowledge imparted, I will now move on to the new Nomads.

I will review the Nomad's new capabilities and more to include new software from CHI Systems, which you can check out at <http://www.chisystems.com> that allows the Nomad and other GPS devices to work in what is now being euphemistically called "a GPS-denied environment." Plus, I will let you know about a protective covering for mobile devices at home and in theater that really works. I have one for my mobile device and believe me when I say that I have first-hand experience that it works as advertised.

Trimble Nomad 800X

The Nomad 800X series models, and there are three of them, include a flexible, high-strength antenna as well as new signal-strength indicators, and they all carry an IP67 rating and meet stringent MIL-STD-810F military standards for drops,



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vibration, dust and extreme temperatures. All three models feature the Windows Mobile operating system for easy compatibility with a wide variety of common and specialized software applications such as the Environmental Systems Research Institute or ESRI GIS, and GPS applications that are now standardized across the DoD as well as many federal, state, county, and local government agencies.

It is readily apparent to me that Trimble has been listening to its users, always a good thing for a successful company; the U.S. government could and should learn something here. Trimble has not only been listening to warfighters, but to firemen, policemen, and utility workers as well. The Nomad is a great device, the users said, but it could be better if it included:

A more sensitive GPS antenna: Trimble responded by not only improving antenna gain and reception, but also by moving the antenna location to the top of the Nomad so that when users are holding it correctly the antenna points toward the GPS constellation. This was not a simple change but it is one that makes a noticeable difference in signal strength and reception. I was able to receive 7-10 GPS satellites indoors with varying degrees of fidelity, but with the knowledge that I at least had a fix, and as soon as I stepped outside the CEP or circular error probable would quickly be on the order of one to two meters. Time to first fix (TTFF) with this new Nomad is seconds, not minutes.

More connectivity: Trimble responded by adding a built-in high-speed wireless data modem and AT&T's nationwide EDGE network, that is now available in parts of Iraq and Afghanistan, to allow users to communicate from the field to headquarters, a central office, or simply with other users. Those users can also send and receive real-time data and Short message service or SMS messages via a cellular network at speeds up to 1 Mb per second wherever cellular connectivity is available and AT&T has assured me that connectivity is available in large portions of both theaters.

Better communications: Nomad users can still connect to military tactical radios in the field, plus they can now access the Internet, send and receive e-mail, and use optional software with the built-in GPS and communications capabilities to transmit their position in the field along with photos and embedded metadata. As I explained earlier, the Nomad 800X series handheld computers work on the GSM cellular networks globally, including AT&T in the U.S. and in both theaters. This gives a new meaning to phoning it in.

The 800X Nomad has retained its **barcode-scanning capabilities**, making it a valuable tool across a broad array of applications both in the military and in industry, where in-the-field barcode scanning is essential for asset management, tracking, and warehousing. The reader delivers up to three scans per second and offers easy field-to-office or field-to-headquarters connectivity, while providing all-day usage of up to eight hours on a single battery charge.

I found the battery life on the new Nomads to be slightly improved over previous versions even though this series of Nomads have more capabilities and tools that should draw more power. The battery management software is still the best I have seen on any handheld device. Users can choose from a range of compatible battery options, as well as add a new ergonomic pistol-grip attachment that improves efficiency for mobile barcode scanning. Some of you may wonder about the actual utility of barcode scanning outside a retail establishment, but more and more government documents and equipment have barcodes embedded somewhere in the document or on the equipment, to aid filing and retrieving the document or part, plus you might be surprised at all the information available in a simple barcode. In the 800X series, the Nomad 800XC also offers a **2.0-megapixel digital camera**, and the Nomad 800XE features **both the camera and a laser barcode scanner**.

Prices

While I am not allowed to quote GSA or quantity prices for the Nomad 800X series, they are available for purchase commercially or through GSA channels, and the commercial single-unit list prices range from \$2,449 to \$3,049 based on the model and options ordered.

In truth of reporting and at the request of Trimble, I must also include this disclaimer: "... the user will need to purchase a data package from a cellular carrier in order to use Nomad 800X series devices [to their full capabilities]." That's like saying you will have

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to sign-up with a carrier before you can use your mobile phone, and caveat emptor.

Compatibility and Interoperability

For those of you who read my column on a regular basis, you may remember last month I [reviewed the Ricoh combat camera system](#) and mentioned at the time that although the camera has some impressive capabilities as a stand-alone device, it was a far more capable system when coupled with a Trimble Nomad. I had the two devices together for almost two months and can vouch for the fact that they work well together — seamlessly in fact — to such a degree that I thought of them as one unit.

My sources tell me that many of our warfighters feel the same way. Once they have used the two devices together, they do not want to be without those synergistic capabilities. One GSA reseller commented that practically every time they sell a Ricoh combat camera they also sell a Trimble Nomad. Good news for both companies, and especially for our warfighters.

Hopefully it has become obvious to you by now that the Nomad is quite a capability in a handheld device. It pairs and integrates well with other essential equipment and can indeed save time, resources, and lives in our war against terror.

DC4S or Distributed Crisis Coordination, Command, and Control System

And in the war on terror it occasionally happens that a GPS signal may not be available when our warfighters or first responders need it most. Loss of signal can be due to natural phenomena, such as hills (terrain), heavy foliage, heavy rain, or thunderstorms, or by man-made edifices such as buildings or urban canyons. Or perhaps the user is inside a building that weak GPS signals cannot penetrate, or even underground. Whatever the case, the user needs the GPS signal, but finds himself or herself in what we have come to label as “a GPS-denied environment.” This is where systems like SUSA or Small Unit Situational Awareness, now relabeled for clarity as DC4S, from CHI Systems come into play.

Normally, my policy is to not publish a review of a product or recommend it unless I have personally experienced it or have first-hand knowledge of the capabilities. In this case SUSA or DC4S is a product that is resident, in software, on the Trimble Nomad, and while I was able to activate the software, I am waiting for a chance to fully test DC4S. As you will see, it is an entire system of systems, not a standalone product per se. Certainly a single user can use and benefit from the DC4S capability, hardware and software, but it is the SUSA or DC4S system working in a GPS-denied environment to supply Blue Force Tracking data and additional situational awareness that makes it so worthwhile.

I am including here a brief description of DC4S and where it has been tested. That will have to suffice until I can personally test the full system and report on it more thoroughly. But it is a dismounted warrior capability whose time has come, and its flexibility and adaptability also makes it useful for firefighters, police departments, and first responders.

“The DC4S for First Responders project was designed to rapidly modify mature military technology for dual use by first responders, and then to test the resultant first responder technology in a variety of very difficult, but realistic situations which first responders face.

“The first major capability of the DC4S technology is a man-mounted inertial navigation system (see Figure 1) combined with a number of software algorithms and heuristics, which allow accurate GPS-denied navigation and geo-location by users wearing the DC4S system. Using output of the inertial navigation system, DC4S software applies correction algorithms to provide a refined location, and also allows the user to override the inertial navigation system and correct the user’s location if the user feels he can more accurately locate himself than the system can — for instance, if he has a building blueprint.

“However, GPS-denied navigation by itself does not usually meet the requirements of our warfighters or first responders. In most first-responder incidents or military tactical situations, SA or situational awareness is also required. This means that users must let others know where they are, that they know where their team members are, that the incident or tactical commander can control the team, and that all users can collaborate to

work efficiently. DC4S' second major capability is the ability to provide this type of situational awareness and collaboration, which facilitates real-time tracking of users by other users and by a command post or headquarters, as well as real-time team collaboration. This is accomplished over a variety of communications mediums to include commercial digital UHF or Ultra High Frequency radios, military tactical radios, Wi-Fi, and cellular data networks. Figure 1 shows an example of the DC4S system as configured for military tactical operations."



Figure 1. DC4S Configured for Military Operations

DC4S technology is currently at Technology Readiness Level (TRL) 7, which means that it is mature and has been used successfully in realistic operational scenarios. Over the last two years, it has been used in a variety of exercises by U.S. Special Operations Forces (SOF), by FEMA search and rescue teams, and most recently in exercises by the Vista, California, Fire Department and San Diego Harbor Police as part of the demonstration phase of the project.

So, there you have it in a nutshell. It sure sounds like a great backup or augmentation to GPS and other positioning systems, and it has proven itself in several real-world scenarios in and out of the military. As soon as I have a chance to personally test it more fully I will be back with more, but it is an exciting technology whose time has come.

OtterBox

Strange-sounding name I know, but the company produces superior products, and they are just a hundred miles up the front range of the Rockies from my home.

I heard about OtterBox products by word-of-mouth from numerous happy customers. I liked what I saw and heard, so I gave them a call.

I am trying out the Blackberry Storm as a personal mobile device, and while it is a great communications tool, it is not in the least bit ruggedized. I asked the nice folks at OtterBox for a case for the Blackberry Storm only to learn it had not quite made it to market yet, but in just two weeks of my asking I had one delivered to my door.

It took me a full three minutes to get it out of



the box and onto or around my Blackberry Storm, no directions required. The whole process is quick and intuitive. There is a hard polycarbonate shell that surrounds your phone and includes a clear plastic covering to protect your screen, and then on top of that goes a very nicely tactile outer, in my case black, silicon covering that makes holding onto the mobile device much more secure as well as helping with dust and waterproofing to a much greater degree than just the naked Blackberry.

The OtterBox on the Blackberry Storm does substantially change the form and fit factor of the phone, so it comes with its own carrying case, which was much more substantial than the one I was previously using. Let's put it this way: your phone will never fall out of the case and the case will never accidentally detach from your belt or whatever you have it attached to. It takes a very positive and deliberate effort for both actions, which is a good thing.

So what, you may ask? Just what do all these layers of protection accomplish? Basically the OtterBox cases offer handheld devices three layers of protection. It all starts with a thin, clear membrane that provides scratch and dust protection for your device's screen and buttons. The second layer is a hard Polycarbonate shell, which offers added protection from harmful drops and bumps, and the final layer is a high-quality silicone skin designed specifically to absorb shock — plus it looks cool.

So if you routinely drop and damage your mobile devices or just want to protect them to a greater degree or just want a really neat looking rugged case, then the OtterBox is for you. [You can check them out at their website.](#)

I am so enamored with the OtterBox that I cannot imagine having another mobile device that is not protected by OtterBox technology.

They also make an awesome OtterBox for the new Trimble Juno which actually makes the device much more attractive and adds even more protection to a device that is already hardened, but not to MILspecs. More on the new Juno in a future column.

That's it for this month. Next time I will report on the AFCEA Spacecomm 2009 Symposium among other tidbits and let you in on some good news about progress in [the search for the Perfect Handheld GPS Transceiver or PHGPST.](#)

Until next time, happy navigating.

Don

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