

SPACE

The Warfighter's

The following edited comments are from six Warfighters who addressed industry representatives in January at the annual Armed Forces Communications and Electronics Association Conference in Colorado Springs, Colo. *Transcripts and edits by Mike Howard and Sharon L. Hartman*

COL B. SHANNON DAVIS

Deputy Commander and Chief of Staff,
Fort Carson, Colo.

It really comes down to Soldiers on the ground — the trigger pullers — and their Families. Our Soldiers are in harms way and the more we can do to bring them back safely, and win our nation's wars is what I'm all about. At Fort Carson, Colorado, we recently had five casualties in Iraq and those Soldiers won't be coming home for a reunion. We have brigades coming in and out of Fort Carson on a routine basis. We've lost about 240 Soldiers just out of Fort Carson and many, many more wounded for life. When I look at how information technology is growing by leaps and bounds everyday, I look at what it can do for the Soldier on the ground to win our Nation's wars and bring them home safely. Our men and women have been sacrificing for a long time. It's been a long war — a long protracted war with a long way to go. Whatever we can do to help them in any way through technology is well worth our best efforts. I applaud everyone out there for being a part of the team to make the folks on the end of the sphere be able to keep their edge from day-to-day, fight-to-fight.



A little bit about the way Information Technology helped in Afghanistan. Back in 2005, we used the Blue Force Tracker and satellite pieces for situational awareness while conducting operations in probably the most mountainous country on the globe. Afghanistan has peaks up to 16,000 feet, and with us having to fly all over that country in and around the mountains to conduct operations, it was imperative that we could see ourselves. The Blue Force Tracker and satellite communications made that possible. It was just imperative that we kept those systems up and operational on a daily basis. We could fly from, Bagram and Kabul out the Pakistani border all the way back to the Iranian border and still see ourselves and be able to text message each other, talk to each other and gain situational awareness. This capability just greatly enhanced our ability to conduct operations over there.

Perspective

While deployed in Iraq, LTC James R. Rice and CSM David H. List, of the Mission Support Element, Fort Carson, Colo., stand guard by their vehicle as an improvised explosive device is detonated in the background. Photo Courtesy Fort Carson Public Affairs



“When I look at information technology that’s growing by leaps and bounds everyday, I look at what it can do for the Soldier on the ground — winning our Nations wars — and bringing them home safely. Our men and women have been sacrificing for a long time. It’s been a long war — a long protracted war with a long way to go. Whatever we can do to help them in any way through technology and through all our efforts as a team of teams is well worth doing and well worth our best efforts.”

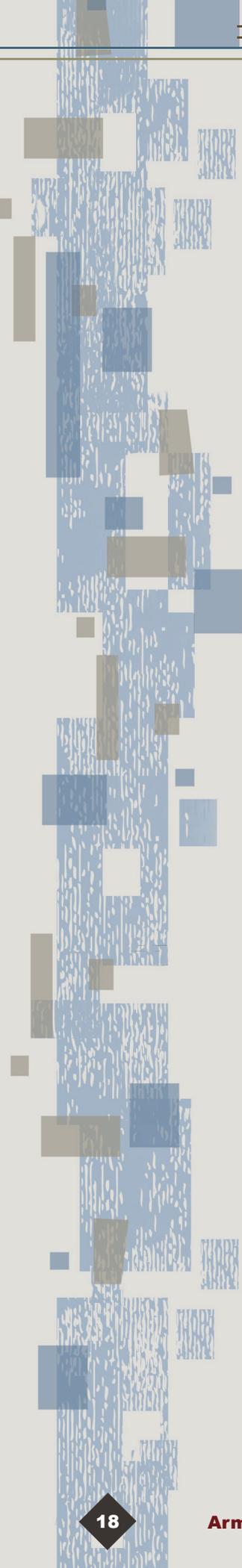
—COL B. Shannon Davis

This article contains excerpts from the Warfighter Panel at the 10th Annual Defending America/SPACECOMM 2008 Symposium.

One of the other things that we used were overhead platforms that gave us the capability of looking at our operations and the whole country. We used this information as we did our detailed planning with the brigade combat team and when we went out to perform operations. This was invaluable while we went out to interdict or intercept al Qaeda operatives or the Taliban operatives in the country. We used Unmanned Aerial Vehicles, RC 12s, and many other platforms up there en route to doing some of these operations. Maybe we had a target that we were going after and, en route, we were actually getting communications in the cockpit that says “Okay, we’ve got information while you’ve been flying and you’re four minutes out to your time-on-target, the HBT has moved to this location.” With the grid on that location, we could then divert en route and not waste a whole operation. Most of the time we landed on the new location unloaded our troops and took down an HBT because of this.

Those were the types of things that enabled us to do our operations and have the success rate that we did in Afghanistan. Being able to see ourselves, see the enemy and stay on the edge and conduct operations. I will say that the enemy is getting very smart. We can’t keep what we’re doing from them. They have ways of finding out a lot of things in our operations, so we constantly have to be changing our way of doing operations, utilizing the technology available to us to stay in front of the enemy.

Let me transition into more recent activity in Iraq. I was called up to put together an advisory team last year. I stood up a team of advisors for the Baghdad operational command, which is a three-star Iraqi general and his staff. The newly formed command in Baghdad became responsible for the security of Baghdad and all the Iraqi security forces there. We were the advisory team to interface with the American forces, the coalition forces and his forces — about 66,000 troops total when you include the Iraqi army, the national police, the Iraqi police, the Iraqi soft forces,



etc. I don't speak Arabic, so I went over there and I was working with interpreters and we were setting this advisory team up and shadowing his staff that's controlling all the Iraqi security forces in Baghdad.

The technological edge that we brought to the table with the command post of the future, with our UAVs, with our stealth technology, just with our conventional aviation, with our ground forces, was just phenomenal. It was very slow going at first. The Iraqi operations center was using cell phones and a bunch of stickies, posted on a map. We went from that type of an atmosphere in the six months that I spent there to where they were actually putting Blue Force Tracker like devices on their HUMVEES. They didn't want to go anywhere without us because they knew we had the technological edge, they knew that we could find ourselves in Baghdad. Believe me, Iraqis get lost just in Baghdad more than the Americans do. That's a big city over there, and they knew we had all the technological tools at our hands to help keep them safe. To help them do their job.

So, that's another tribute to the things technology can bring to the table. We went from those stickies and cell phone calls to get their orders out, to actually producing operations orders hand-in-hand with our ground forces, — working civil military operations to clear Baghdad. As we began to do that, the general populace in Baghdad developed more faith in the Iraqi security forces. They began to flow back into Iraq. This was during the surge period when we brought more forces back into Iraq and we began to go security district by security district and eradicate al Qaeda and other extremists in and around Iraq.

By the time I left in August, the Iraqi security forces had stepped up to the plate. They were doing joint operations with us. They were doing their own single operations and the people were starting to come back to Iraq. They had more faith in the security forces and the government. When the sheiks and the tribesmen around the borders of Baghdad began to have faith, General David Petraeus got them where they would

actually come to the table and say they we're tired of the al Qaeda operatives bombing their innocent people indiscriminately, and they wanted to help and assist us. So what they did is they would come and tell us if somebody moved into their neighborhood, al Qaeda operatives, extremists, Iranians that were helping supply the extremists with EFPs (Explosively Formed Penetrators) and things like that, Improvised Explosive Devices, they would say: "Hey, they're here. Come get them. We don't want them here. We want them out of here." That was what the turn of events was in the six months that I was there and it's still continuing today.

I have frequent contact with folks in theater over there and the things we bring to the table to help in the technological realm are just endless. I will tell you that the things we need to develop and keep developing and using on the battlefield are things that could be used in real time, things that can be used quickly, things that are relevant, things that are easy for the Soldier, the NCO, the lieutenant platoon leader, the pilot just out of flight school going into combat for his first time, that are easy to understand, easy to use, quick and relevant to the fight. I think that's a challenge. It's much easier to develop things that maybe show a command post at Washington, D.C. or maybe somewhere else in theater, a situational awareness that doesn't really bring relevancy down to the trigger puller on the ground and I think that's a challenge that we need to always keep sight of.

Let me again reiterate that the Soldiers and Families are what it's all about to me and I think it should be for most people in the military, and I'm not just saying in the Army, I'm saying across all the services. The jointness, the interoperability, and the relevance to the trigger puller on the ground to win and fight our nation's wars to win that next battle is what this really should be all about.

COL B. SHANNON DAVIS

Deputy Commander and Chief of Staff,
Fort Carson, Colo.

COL B. Shannon Davis is currently serving as the Deputy Commander and Chief of Staff, Fort Carson, Colo. Prior to this, Davis was deployed for Operation Iraqi Freedom to Baghdad, Iraq, where he served as Chief, Baghdad Operations Command Advisor Team for Multi National Corps – Iraq. Davis also commanded the 25th Aviation Brigade, 25th Infantry Division, Schofield Barracks, Hawaii and Joint Task Force Wings during Operation Enduring Freedom V in Afghanistan.



CSM DAVID H. LIST

Command Sergeant Major
Mission Support Element
Fort Carson, Colo.

I've been extremely blessed in combat. I had the first tour with the 1st Squadron, 10th United States Cavalry in OIF I. I was on the patrol that captured Saddam Hussein. When I went back this last tour, I was with the third Heavy Brigade Combat Team, 4th Infantry Division. We killed Al Zarqawi in Baquba. So I've been pretty well blessed in combat operations. From those two tours, I've got two stories I would like to relate to you. These stories are about Soldiers who asked me questions that I could not answer.

The first story is about when we had an Unmanned Aerial Vehicle flying over Baquba. My brigade commander and I were sitting in the operations center with the S3. We were watching the UAV feed as three insurgents were setting an Improvised Explosive Device on the side of the road just outside of Baquba in the canal section. As we were getting UAV feed, we were also sending it down to the battalion headquarters so that they could send a patrol out to apprehend the three insurgents. The insurgents had already dug the hole and set the munitions — they were ready to spring it on some unfortunate individual coming down that road and in most cases that ends up being one of us.

When our patrol arrived, the sergeant first class dismounted with his five man team and, using what we saw on the UAV feed, we maneuvered them to where the insurgents were. The problem was it was two o'clock in the morning. There was no moon, so our guys had to use their night operations goggles. So we maneuvered them through those canals and heavy underbrush. As the insurgents moved to set up the IED to ambush our patrol, we would maneuver the patrol around. I'm sure the insurgents on the ground were thinking "how do these guys know where we are?" Finally after about an hour-and-half, we cornered the insurgents with their backs to the canal. Using the UAV feed, we got the patrol leader to move forward with his Soldiers — all with weapons at the ready, they went and captured the three insurgents without firing a shot. No Americans were injured in any way shape or form.

That was a pretty impressive day.

I went to the After Action Review after the patrol brief. The sergeant first class said to me: "Sergeant major, I could've gotten them in 15

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—CSM David H. List

minutes and I wouldn't have had to kill myself for an hour-and-a-half slipping around in that mud out there. I needed something like an FBCB2 (Force XXI Battle Command, Brigade-and-Below) about the size of a blackberry with some type of satellite feed so that I could've seen where they were moving." I told him I wasn't sure we have anything like that developed but that I'd ask about it later.

The second story involves engineers who had to do a route clearance up on the Iranian border. They asked me to ride with them, so I went to their patrol brief. We did our pre-combat inspections and checks before I mounted up with this young man and his NCO. As I talked to this young specialist, I learned that he had been in country for 18 months with a one-month break. He said to me: "I've only been blown up 47 times and my buffalo has only been tipped over five times." He added: "You know what? Even with the crew system we have onboard and the electronic control measures I have back here in the back of the truck that I turn on every time we go out, for some reason they still seem to blow me up." Then he asked me: "Isn't there some kind of system that can fly over and either explode these things before I get there, or render them non-mission capable? Can't they just take a satellite and burn those things right out of the ground? I'm sure they can see them from up there." And I said: "I wish they could do that, but right now you and I have got to clear this route." So we rolled out. We were right outside the gate not ten minutes before we found an IED. Luckily it didn't go off. The Soldier and his NCO dealt with it — they took that thing apart, disassembled it and got it set so the Explosives Ordnance Disposal guys could come pick up the pieces and figure out who the bomb maker was that day.

The point of these two stories is that in all my experience, in all the operations that go on from day to day, it's that young Soldier with boots on the ground with the staff sergeant, sergeant first class, lieutenant and captain leading him. These are the guys it's all about. So anything — anything — that can be done to help our Soldiers who are on the ground come home safely with all their fingers and toes would be a wonderful thing.

LTC THOMAS POWELL

G3 Senior Mission Command
Fort Carson, Colo.

I was in Afghanistan two times — first in 2002 and again in 2006 and 2007 — so I got to see a change in the country which was heartening to see to say the least. I was the J3 for a new Joint Task Force that we had just stood up. Task Force Paladin was organized and designed to destroy the Improvised Explosive Device network cells in Afghanistan. We had a kill-capture mission and to take down the IED cell leaders was obviously one line of operation. We all know and understand that IEDs are a dangerous system out there. The fight in Afghanistan and the fight in Iraq are quite a bit different from the perspective of the IED fight. Also the fight is different. If I was to show you a slide about Intelligence, Surveillance and Reconnaissance assets in Iraq, you know it would be spaceships flying everywhere, and the Afghanistan slide would have a biplane. That was a little joke we used to have over there. We were always ISR hungry over there trying to get more information about how to take down these cells.

It was getting better and better as time went on, which brings me up to the bandwidth issue. At the Soldier level, we always heard a lot that bandwidth was a problem. There's lack of bandwidth in Iraq, so why don't we bring it on over to Afghanistan. Then we would have trouble when you go out to some of these distant places and jump onto a computer there and it would take forever to download and send an operation order across. We had our own internal problems. We found out also that you can't just blame the bandwidth because whenever a communications expert came down there to figure out how to best wire everything up, it was miraculous how the bandwidth got better. I think Soldiers at the troop level so often don't understand what it is in the C4ISR community that is going on, but will blame other guys for a lot of stuff when we can obviously help ourselves.

CSM DAVID H. LIST

Command Sergeant Major
Mission Support Element
Fort Carson, Colo.

CSM David H. List serves as the Mission Support Element senior enlisted advisor, Fort Carson, Colo. In June 2004 CSM List assumed duty and deployed to Operation Iraqi Freedom-5 as the 3rd Heavy Brigade Combat Team, 4th Infantry Division Command Sergeant Major. List also served as the 1st Squadron, 10th U.S. Cavalry Regiment Command Sergeant Major in June of 2001 where he served with the Squadron for three years, participating in Operation Iraqi Freedom-I leading the 4th Infantry Division's attack into Iraq.



Along that same line of thought, I want to address information sharing. In the Kosovo war, JSTARS was a new platform. At least for us in the Army, we saw it as a strategic asset. We learned that we needed to connect the dots from information we had on JSTARS with our own information we knew about our internal operations. By doing this in one operation — long story short — it enabled us to take out a whole lot of artillery. After the fact, we sat down and said well there should be a system, there should be an analytical system that makes those kinds of things happens together. When we know there's a fight going on that's utilizing certain weapon systems that give off certain signatures, it

should be the community of smart people that bring together some kind of way to make that happen. Obviously right now it's a lot of those S2 kinds of guys connecting those dots and making it happen, but that was one small success story of bringing what was considered a strategic asset to a very tactical area bringing them together and taking care of the enemy.

The same thing kind of happened in Afghanistan a number of years later. Now Afghanistan is not an urban fight. There's no Baghdad. Kabul's got four million people, but we don't have a big fight going on in Kabul. It's a lot of small villages and compounds where the enemy is trying to intimidate the locals, and that's where he lives and that's where he gets sanctuary through intimidation or support. That's where we had all our small units running operations out of all these small forward operating bases all throughout the country. One of the things that we saw, because we were trying to take out the cells, was as the Joint Task Force that I was in, we had access to a lot of the communication intercepts capabilities and so we were tracking different enemy players on the battlefield. Obviously the good ones don't talk on their personal cell phones, but other underlings do and that's how we got a lot of information. That became a pretty successful thing. As a matter of fact, we were able to track one of the bad guys down while he was in the gas station right on the highway right there outside the gate calling it in.

The final thing is the young Soldiers and those young captains who have to figure out these plans to make things happen, they are really focused on the Pre-Combat Checks and the Pre-Combat Inspections — making sure that their kits are ready to go. They don't have all the time in the world to connect the dots and that's what I would emphasize. There are a lot of information systems out there. We've just got to figure out the best way to share it, connect the dots and then get that down to the junior leaders out there who are actually pounding the ground and killing the enemy.

"We had our own internal problems, we found out also that you can't just blame the bandwidth — you know, the genie in the sky — because whenever a communications expert came down there to figure out how to best wire everything up, it was miraculous how the bandwidth got better. I think Soldiers at the troop level so often don't understand what it is in the C4ISR community that is going on, but will blame other guys for a lot of stuff when we can obviously help ourselves."

—LTC Thomas Powell

LTC THOMAS POWELL

G3 Senior Mission Command
Fort Carson, Colo.

LTC Thomas Powell is the current Chief of Training for the Fort Carson Mission Support Element. Powell recently returned from Afghanistan where he served as the J3 for Joint Task Force Paladin in support of Operation Enduring Freedom. Prior to deploying to Afghanistan he served as commander of 2-362nd Field Artillery Battalion at Fort Carson, Colo.



LTC JAMES R. RICE

Deputy Commander,
3rd BCT, 4th Infantry Division
Fort Carson, Colo.

It doesn't matter for me if it comes from Space — I just want the capability. Some of these things that I'm going to talk about really can be done by long-dwell air-breathing systems and that's fine with me. That's fine with the Soldier on the ground, but what I'm going to talk about is my experiences as a leader with troops at what I call the pointy end of the spear where it's dirty, muddy, rainy, freezing cold or blazing hot and, often times, those leaders at that point don't have a lot of things that they can do to help them. They don't have hard-wired systems the general officers have at their headquarters. They don't have hard-wired systems that their brigade commander has at his headquarters, even though that headquarters may be in a tent.

The first thing is: Space isn't broken. We could not have done the operations that we did in Iraq without the assistance that we got from Space. It would not have been possible. What I am trying to do is identify challenges faced by leaders in combat. You've got to remember that I've personally been back from Iraq for just over a year now, so my information is dated. I think the underlying concerns and the underlying themes do remain valid. So, it's not an indictment of Space with these themes I'm presenting, but a way to determine how we can best support leaders and fighters on the ground.

Space doesn't do that much that the average rifleman can see, touch and feel. My driver on the last tour was a guy named Buckley. He was a private first class when we started out. He's back in Iraq today and he's a sergeant leading his own squad in combat. I asked Buckley one time: "Hey, what do we get out of Space?" Buckley said: "I don't need anything from Space. All I need is my M4, a GPS and some way to talk all the way around the world and I'll kill every AIF in Iraq." AIF is the anti-Iraqi forces. I didn't say anything to Buckley. That's the rifleman's perspective on this. The reason is they don't look at it the same way technology developers or even military leaders do.

Blue Force Tracker versus FBCB2 — For an infantryman, Blue Force Tracker is what we call a system that is satellite-based where you've got blue feed and red feed if it's plugged in there into your vehicle. You've got a computer screen in your combat platform and it gives you situational awareness. FBCB2 is the exact same thing except it is a terrestrial-based, ground-based, radio-based system. The challenge is this: I was in the 4th Infantry Division — at one time the Army's digitized division — and we were in the stubby pencil analog brigade of the Army's digitized division. In very, very short order, we went from acetate and paper maps and radios to the EPLRS-based FBCB2 system and then deployed the brigade into combat. We had quite a learning

curve figuring out how that stuff worked, but what we found was our own situational awareness obviously went up exponentially. We also learned some of the challenges with the satellite-based Blue Force Tracker system in the Army vice the big-scheme tracking blue forces and FBCB2.

The challenge is that for rifle, tank and scout platoon leaders, their offices are in a tank or Bradley or a HUMVEE. Sometimes their office is in their rucksack on their back — that's all they have. There's nothing that's hardwired. It's brutally hot or unbelievably cold. Somehow, someway, sometimes at the same time — and I don't know how that works out — but the bandwidth shortfall occurs at the lowest level, at the pointiest end of the spear, where the Soldiers and their leaders are in direct fire contact with the enemy and they have the least ability to communicate data back up the chain or receive information down the chain that's analyzed for them to be able to use.

So we've got to expand the operating spectrum at the lowest levels. The bandwidth has got to be able to support live updates to multiple systems. This is one of the things that slows down even getting information into the brigade headquarters, let alone pushing it further down to company commanders and platoon leaders. We blasted out our information from our systems down to Kuwait, through trailers, back up to Baghdad, bounced back up again, came back north to our division headquarters. All of that happens pretty quickly. All of that can also give you latency in your system and cause delays in getting that information back to the brigade headquarters. The headquarters is where you have your real analytical capability and then the ability to push it back down to the Soldiers in the field, so this slows down the operation. Without the information passing — and more importantly the knowledge passing — the information doesn't do you much good. The analyzed intelligence gives

that leader on the ground the knowledge that he or she needs to be successful in the operations.

It's also important that everything that goes through brigade combat teams airspace has some ability to update and relay that to their common operating picture. We've got pretty good Situational Awareness on the combat platforms within the reach of the systems, but there's a significant number of vehicles both in the air and on the ground out there that aren't combat platforms and don't show up. When they're in your battlespace and they get in trouble, now they know where you are and how to get a hold of you on the radio. It's really nice to know they're there before they're in trouble.

To put it into perspective, we operated about 200 kilometers wide east-west by 230 kilometers north-south. That's roughly the size of Vermont and New Hampshire. Yet we dominated that terrain with just about 5,000 Soldiers — unheard of. In World War II, there would have at least been a corps in an area like that. What is hard for up-to-date folks to grasp is that really, probably as little as ten years ago, there'd at least have been a division there if not a division-plus.

Electronic Signature Dampening — All the systems we've been talking about give us a tremendous signature on the ground, and our enemies are not stupid. They hire some stupid people to go do stupid things for them. We did our best to take care of our guys, but the enemy has got some really brilliant people who work for them and I don't want to discount what they're capabilities are. With off-the-shelf parts, they're building systems that can track us on the ground because of the electronic signature that we create. Now I don't know how we can shut down that signature without limiting our ability to communicate

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LTC JAMES R. RICE

Deputy Commander,
3rd BCT, 4th Infantry Division
Fort Carson, Colo.

LTC James R. Rice has served as the G3 (Operations Officer) for the Senior Mission Command and the 4th Infantry Division, Fort Carson, Colo., since February 2007. Prior to this assignment, Rice served as the Deputy Commander of the 3rd Heavy Brigade Combat Team, 4th Infantry Division. Rice deployed to Iraq with the Brigade in October 2005 and returned with the Brigade's trail party in November 2006.



and generate situational awareness. But I think with a combination of Space-based monitoring and ground-based signature dampening — Space-based monitoring to say hey wait a minute, that group on the ground is putting out a heck of a signature right now, something's not working right — I think we can get into a better scheme of protecting our force on the ground.

The Tactic, Technique and Procedure — or TTP — is what we use to help identify, interdict and destroy an Improvised Explosive Device (IED). The problem with that is it changes all the time because as we figure out a way to defeat a particular IED, the enemy adapts to that and we have to constantly change. While it does protect the force, it doesn't really do anything to eliminate the threat of IEDs. No matter how many IEDs I picked up out there, there were always more IEDs back out on the ground. There seems to be almost a limitless supply of stuff that the enemy can use to try to blow you up with. So, how do we apply technology to help defeat the IED and essentially render it ineffective?

If I go down with a heart attack (right now, you can) take me to Memorial Hospital and using computer imaging, a heart surgeon can take a look at Jim Rice's heart. Not a facsimile of my heart, not a rubber model, but the real thing. He can find the flaw and, if it's fixable, go in, and maybe not even with open heart surgery anymore because of other surgical techniques, fix the flaw. And maybe I'm out doing

PT again next week. That's exactly how state-of-the-art heart surgery is done.

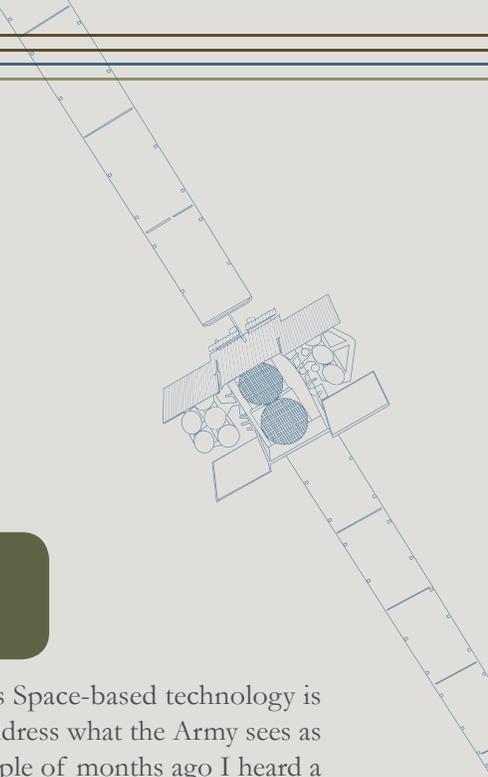
Using that exact same imagery, I believe, with Space-based systems, we can develop persistent monitoring of our roadways. We can link that directly to vehicle convoys, and that Space-based system, using computer technology, can determine that there are disturbances in the ground, whether it's on the side of the road, in the road, in the dirt pile beside the road, and relay that directly to vehicle convoys that are on the ground so that they can stop in time to secure the area, render the IED safe, protect American forces and press on with their mission. When we can develop that technology and field it, we've now done something that makes the IED ineffective against American forces. And that starts putting the IED network out of business. By doing that, we take one of the key killers of American forces off the battlefield. Everybody knows that's the main threat that the enemy uses right now. I don't know of any Marine or Soldier who has been defeated anywhere in Iraq or Afghanistan in a straight up fight. So that's my challenge to industry and the Space community: Figure out how to put that into the vehicles.

We talk about pushing technology to the lowest level. Let's use the blackberry as an example. Now if I drop this thing in the creek, it doesn't work anymore — and trust me, American Soldiers can destroy an anvil with a rubber mallet, so you've

got to make it a lot harder than a blackberry is now. However, the capability is there. The newest one has just exactly what Buckley wanted. It'll let me talk anywhere around the world and give me a GPS. I've got a push to talk for instant walkie-talkie. I can send e-mail. I can take photos. I can receive photos. Now you've given that platoon leader, platoon sergeant, squad leader, company commander something that is truly effective in giving him the ability to not only receive information at his level, but send it back up the chain of command to his battalion commander, brigade commander, division commander, where there are more resources to analyze what that guy's seeing. So that's the kind of technology that we've got to push out to the lowest level so the Soldiers have it to use.

The final thing — At the present time we can see virtually every combat platform that's out there. But, we've got to develop the capability to see every Soldier, Sailor, Airmen or Marine that goes outside the wire. For lack of a better term, I guess I'm looking for something like a Space UAV. The key is we've got to have persistent surveillance to the areas where we operate. Five-thousand Soldiers cannot operate in 50,000 square kilometers with a Soldier at every piece of terrain all the time. But we do need eyes on every piece of terrain all the time. So why not develop something along the line of a Space UAV that you can bring back to earth, refuel, assign a new mission, and fly wherever needed when needed. That's what generates that ability to maintain persistent surveillance in that giant area of operations that our brigade had.

With this capability, we would be able to see where problems are cropping up. Then, using the massive bandwidth we've been given and this small communication/knowledge passing device we've developed and fielded, we can surge the force to the critical time and the critical place on the battlefield and get them out there to accomplish the mission by defeating the enemy and then bring them all back home safe again.



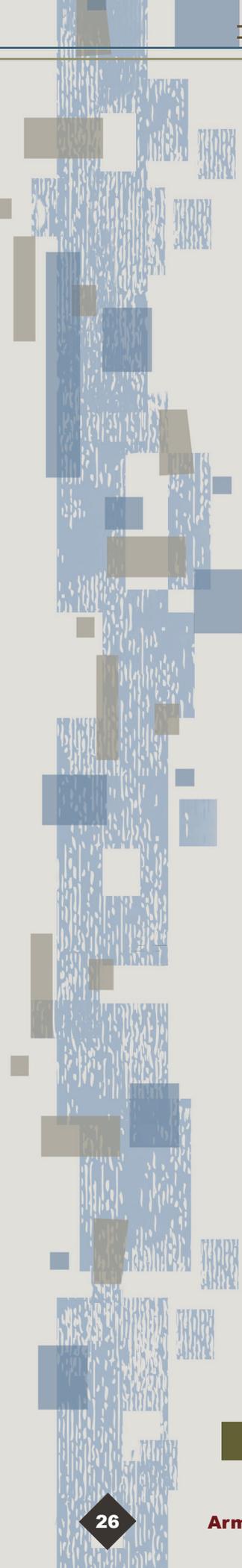
BG JOHN E. SEWARD

Deputy Commanding General for Operations,
U.S. Army Space and Missile Defense Command/
Army Forces Strategic Command

I'd like to address some of the ways Space-based technology is empowering our warfighters and I'll address what the Army sees as gaps in those Space capabilities. A couple of months ago I heard a warfighter say that Space doesn't do much that the average rifleman can see, touch or feel. I think that sometimes the same thing can be said in general of those systems we use to empower our warfighter.

I'd like to start with my own experiences in Iraq. I commanded the 108th Air Defense Artillery Brigade during Operation Iraqi Freedom I. We were in direct support of the 1st Marine Expeditionary Force during their attack into Iraq and up to Baghdad in the spring of 2003. I didn't realize how long ago that experience was until I realized I was invited back to speak at one of the brigade functions and I was introduced as Spartan O6 ancient. The technology between 2003 and today has just been astronomical. I remember during my day having 450 kilometers between my units in Iraq without really being able to communicate very well. We had SATCOM phones which allowed me to communicate clearly back to 18th Airborne Corps headquarters in CONUS, but for some reason I couldn't talk to all of my batteries. For all practical purposes, many were autonomous. We never figured out why we couldn't talk to them, but the Army's long range communication equipment called mobile subscriber equipment wasn't compatible with the Marine Corps gear that we were attached to. This forced me to attach liaison officer parties to every Marine regiment headquarters and larger formations to disseminate missile warning alerts.

We didn't have sufficient Global Positioning System receivers in the brigade. We only had one Precision Lightweight GPS Receiver in our brigade tactical operations center. Think about a 100 vehicle convoy in the worst sandstorm in over a century with only one Soldier with a GPS receiver and any clue where we were. Additionally, we didn't have any Blue Force Tracking devices in the brigade. We had to rely on very antiquated means of maintaining situational awareness, but it



was further complicated by our lack of functioning long range communications equipment, and we were in the days of yellow stickies on the map.

There have been some improvements since then. Every vehicle in the convoy now has GPS. Every three or four of them have a Blue Force Tracking device that feeds into a common operating picture. Department of Defense has made strides to fix the communications incompatibility problem by going to an internet protocol based system and developing the Joint Tactical Radio System. One suggestion for industry is the smaller the better and I will tell you that is improving.

Some of the Space shortfalls as the Army sees them were identified through the TRADOC capabilities needs analysis process and were vetted through the Army Space Council. The Army has determined that the greatest risk to ground operations is the limited throughput and protected military satellite communications capacity. Seamless integrated dynamic bandwidth for battle command on the move through satellite communications is key to land dominance and is key to the Army's future combat systems. You know that in OIF, the forces were using approximately 42-times the bandwidth they used in Operation Desert Storm and that 70- to 80-percent of today's satellite communications capability is currently provided by commercial systems. This shortage of military satellite capacity impacts battlespace awareness, force application, force logistics and joint force protection. A little help is on the way to alleviate that wideband shortfall. On January 18, Department of Defense began the testing phase on its first recently launched Wideband Global Satellite. If all goes as planned, it will be turned over to 1st Space Brigade's Wideband Satellite Control Centers to begin work for warfighters and five more are on the way. Each WGS has ten times the throughput of one Defense Satellite Communications System (DSCS) satellite. The DSCS satellites will remain in use until their remaining operational life.

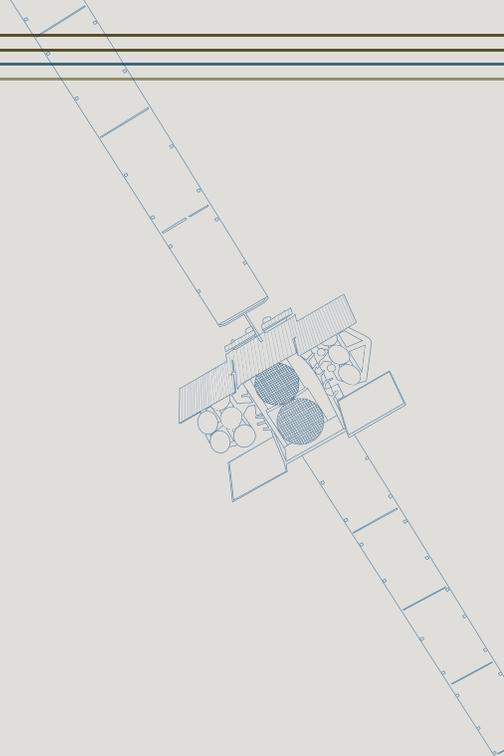
In regards to filling the gaps for JTAGS — our Joint Tactical Ground Station, which does our theater early warning — to ensure that the theaters have missile early warning, SMDC is updating the needs documents to establish a requirement to modernize and update the JTAGS. It will be upgraded to be able to receive and process the Space-Based Infrared System data. It will get new commercial antennas and its equipment will be relocated from a mobile shelter into a fixed theater facility to reduce manning and funding requirements. This is an interim solution to keep the system viable until 2013 to 2015. Later this year, Space and Missile Defense Battle Lab will conduct a net-centric experiment to begin to define a net-centric replacement capability. The goal is to be able to use multiple sensors and multiple processors netted together to provide theater missile warning. SMDC/ARSTRAT has initiatives to fill these gaps. Most are in research and development; all are geared to provide responsive, timely and flexible deliverables for the Army and Joint formations. Providing these capabilities requires investment across the ground and Space spectrum.

It might be useful to understand how the Army integrates Space capabilities into its future force. We do this at the three-star level via the senior Army Space Council. The council identifies and approves needed capabilities, prioritizes them for the Army and integrates them into its overall toolkit of warfighting doctrine, techniques and systems. The Army also periodically publishes the Army Space Master Plan similar to other master plans in the Army, which helps us synchronize Space capabilities between programs, organizations and processes; identify the key Army needs; recognize potential solutions; and define areas for Army advocacy within the overall national Space security community. Current areas of Army focus include influencing the development and

BG JOHN E. SEWARD

Deputy Commanding General for Operations,
U.S. Army Space and Missile Defense Command/
Army Forces Strategic Command

BG John E. Seward assumed his duties as the Deputy Commanding General for Operations, U.S. Army Space and Missile Defense Command/Army Forces Strategic Command on Aug. 6, 2007. His previous assignment was as the Commanding General, 94th Army Air and Missile Defense Command at Fort Shafter, Hawaii.



design of future Space systems and their operational concept to support ground operations; improving the ability to exploit Space systems by the current future force; and facilitating the delivery of Space capabilities that meet Army needs and that meet joint needs.

The Army is expanding the number of personnel in the professional Space cadre. The Army Space cadre, which has its core Functional Area 40 officers, continues to expand its influence to the joint Space community in numerous key positions. We've been very successful in placing experienced FA40 officers

in positions where they can articulate Army Space requirements while also leveraging emerging capabilities to the benefit of Soldiers on the ground. SMDC/ARSTRAT is not only leading the Army to identify and increase the number of Space savvy people, but they are putting them in positions where they can advocate for the Army.

The council also proposed, and the Army approved, the creation of Space elements that are organic to Army, Corps and Division headquarters. The Space element FA40 is a Space expert on the ground who assists with the assessing and integrating of Space doctrine and Space-based technology into the fight for the commander. An example of this is helping track blue forces and giving them location precision for movement and munitions through the GPS constellation. Eventually Space elements will be embedded in 26 Division, Corps and Army headquarters. The Army is also placing one FA40 Space operations officer in Fires brigades to better enable those commanders to use Space operations and to bring Space-based capabilities into the deliberate planning process and military effects based operations. Currently, the Army has about 90 Space experts FA40 officers and other officer and NCO Space enablers deployed in support of OIF.

What can industry do to help? You may have a technology that will help close the gaps in Space capabilities. As you think about what you can offer, remember that mission readiness has to be our number one priority. What is it that will make the Soldiers on the front line effective and bring them home safe? An emerging technology may be the way

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to help them, but it must be something that meets a need. And as my warfighter friends tell me, in many cases, the technology has to reach down to the platoon sergeant. In other words, it has to serve the Soldier on the ground. I say it can't be a great system that sits in the colonel's office and provides information only to the division headquarters, unless that translates into mission information for the Soldier.

Last August, a warfighter commander reported that the rifle platoon leader and his troops are at the very point of the sphere, and too often they have the least robust system. The company commander is equipped only marginally better than his platoon leader, yet he is the guy we really lean on for information. Industry must develop systems that do not require fixed facilities and that are fully functional in an austere accident experienced at the company and platoon level. By doing so, we enhance the capability of the entire force to include the Sailor, Airmen and Marines. We can empower the warfighter with knowledge across the force and all the means.

COL TIMOTHY R. COFFIN

Commander 1st Space Brigade
U.S. Army Space and Missile Defense Command/
Army Forces Strategic Command

If information is power, information out on the battlefield is life. Information gives you the ability to take life, the ability to give life. And that's what we need to give to our Soldiers out there — that ability out on the forward edge.

I'm going to talk a little bit about the 1st Space Brigade. I'm very proud of the things that we've done. We've had forces deployed in support of Operations Enduring and Iraqi Freedom ever since they started. We have Soldiers and Civilians in over 14 different locations, seven different countries and within just the brigade itself, not the entire SMDC/ARSTRAT; we run 10 24/7 operations in support of what's going on. We're a mixed component headquarters. We've got active Soldiers, we've got Guard Soldiers and we've got Reservists. We're very proud of the Reserve and Guard Soldiers and the things that they do. They are all contributing members of the team.

We don't treat them any different. We have the same expectations for them. We train them the same way and they will tell you for sure that we deploy them the same way, because just about everybody in our command has been deployed out the door, downrange in support of our nation's business.

Some of the major missions that we have: we control the DSCS and WGS payloads. We do missile warning and provide Space support to Marine forces; we help expedite commercial imagery to the people who need it on the ground; we provide Space Situational Awareness to help know what's going on in our area.

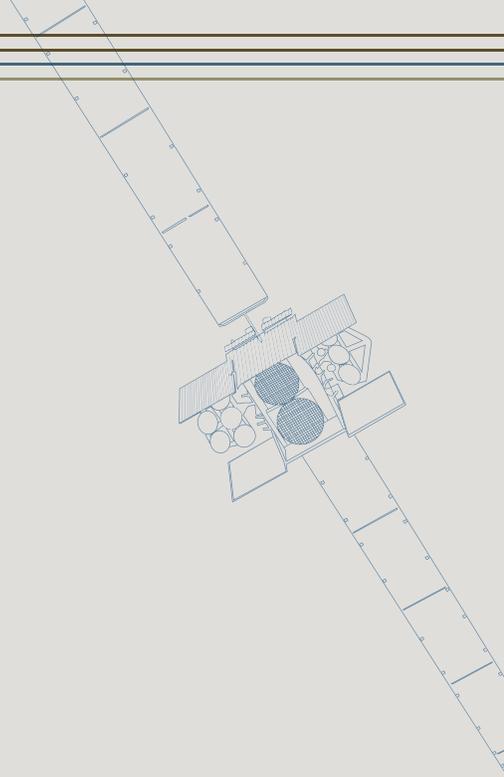
In Space Situational Awareness, we deal and we fight in an electronic realm. Our business is in the area of digits and electrons that flow through the air. So as a Space community, it is important to us to have knowledge of what's happening to each of those. The data paths, whether or not they're being disrupted, if they're being disrupted by who, is it intentional, is it unintentional, are we doing it to ourselves? So, it's important that on a global basis, 24/7, we can have situational awareness of that level and fidelity. We're not there yet, but it's an area that we're growing in — Situational Awareness and understanding. It's an important part of what we contribute within the brigade itself.

When you talk about WGS, you're talking about 1.2 million different configuration manners, sets and settings that you can do on that payload. This is a huge complexity for young Soldiers — some of them don't look like they're old enough to be away from home — who are working and controlling that payload. That caused me a little bit of concern as I first started thinking about it, but then as I watched them get trained to do that payload, I got a different impression. One morning I saw the Soldiers come into class with the Boeing experts who built the satellite and were working them through on the software. This young private came in and said to them, "You know, I was looking at this code last night and

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COL Timothy R. Coffin assumed command of the 1st Space Brigade, U.S. Army Space and Missile Defense Command/Army Forces Strategic Command (SMDC/ARSTRAT) on July 27, 2006. In this position he is responsible for the supervision of three one-of-a-kind battalions — the 53rd Signal Battalion (SATCON), the 1st Space Battalion and the 117th Colorado Army National Guard Space Support Battalion — which are charged with providing day-to-day Space support to the operational Army.



this switch here is not doing what we want it to do, so I rewrote the code, and here's the patch for you if you want to put it into the program to enable the system." So we've got some tremendously talented young Soldiers out there who are passionate about their business, who are digging into the details.

A little bit about the Defense Satellite Program, or DSP. People are aware that the joint program between the Army and the Air Force to create a follow on to JTACS ran into a funding issue. Basically, all the funding that was available was pushed toward fixing problems on the Space segment of SBIRS. Good News! We now have some sensors on orbit. We're getting some great information off those. It's going to be a tremendous benefit for us, but we still have to solve the problems: how do we get that information down in an assured way to people on the ground and how do we make sure that the architecture is supporting the warfighter forward in theater. We have put together working with the Air Force, working within the Army community for a way ahead for this program that is going to leverage that information off the new sensors and bring it into what will be an upgraded joint tactical ground station and allow us to leverage that SBIRS information.

We put a lot of responsibility on the shoulders of a young sergeant, a young Soldier in that JTACS van. A van normally has about three people in it. You'll see some changes here as we go throughout

this next year. We'll do some experiments with the system to make sure that we've got the configurations right. We'll probably experiment with dismounting the system out of its current shelter, and the reason is that we built this system in a paradigm where the cold war was still the ruling concept of operations of the day. That's just not the way we do business anymore. As with many of the systems that we operate within the brigade, we're driving it toward a multiple configuration set up where you have systems that can be mounted if you need to be mobile and move across a battlefield, but just as easily, you could hit the releases on the inside, pull out the racks, plug the information or plug the systems into a fixed architecture and provide support from there. That allows us the flexibility to provide support across a wide spectrum of potential operations that we could face in the future. We've got the last DSP satellite up on orbit. We are waiting patiently for the first geosynchronous Space-based infrared system satellite to go up but we're very pleased with the data that is coming off of those, and we think there's going to be a huge contribution this kind of data can make for the warfighter. We just haven't figured it all out yet. Those of you who have worked in this community for a period of years know

Perspective >> page 32

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Perspective >> from page 29

that we didn't figure out DSP for quite awhile, not until after it was up there for awhile did we figure out other things we could do with it. We're trying to accelerate that process with Space-based infrared system, but with the fidelity of the new sensors, you're going to gather a lot more information about what's happening on the battlefield.

A little bit about Army Space Support Team — we have a total of 27 of these teams in the force structure. They're across the Active Component of the Army, they're in the Colorado Guard force and they're in the Army Reserves. We've just stood up one of the Army Reserve Companies, picked a commander for it, and he's in the process of recruiting and training his Soldiers. One of the teams that will end up in this company is one that we just deployed out the door here this past week. (In the month of January,) I've deployed three different teams into the Iraqi or Central Command area of operations. That's just in one month alone. That gives you kind of an idea of the operational tempo, the things that we face in our operations. We're constantly rotating forces in and out of theater to do that.

We integrate them with the Marines and what has been a great news story is how we've put together a joint team, even though we don't have it on the books, we've pulled in an Air Force weapons officer who's trained in Space, a Marine Space officer along with an Army Space Support Team, and the capabilities they have brought to the warfight have been extremely successful in the kinds of things they've been able to do, leveraging on each others experience, background, depth of knowledge and expertise.

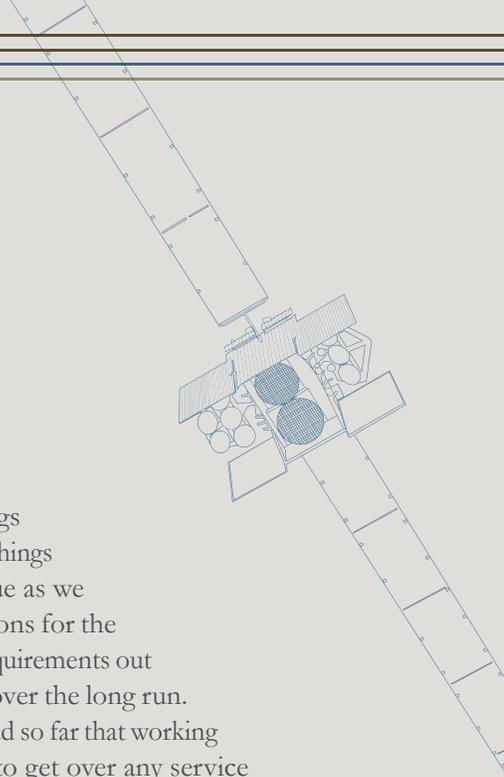
Another area where we had two teams in country recently, one was getting ready to rotate out and come back is our Commercial Exploitation Team. This mission was built on what was a demonstration program called Eagle Vision II. We're pulling back out that hardware in order to refit it. We've just spent about \$2 million in recapitalizing the system, making it modular, integrating it more closely with the National

Geospatial Agency, and the demand for the products out of this system have been increasing about 200 percent a year since we deployed it forward in theater. These kinds of products, the commercial products are so important for our young folks out there on the field because they can take a map product, an image, lay it with the Iraqi policemen that they're working with, show them on the map, saying don't go over here because our crossfire is going to be going across into that building. This is the building where we think they are. How do we get there? Being able to explain information to Red Cross workers about areas they can and can't go into. Hand this to our coalition partners whether or not they have a security clearance. There's a huge advantage to having this kind of capability out there in the battlefield.

I'd like to close with just some themes that are on my mind for how we do things. We talk about the architectures and how we bring all that together and how we do modeling and simulations of all those pieces. There's a problem here and that is most of our models and simulations don't get down to the Soldier level. They don't get down to that actual user. They replicate often times the collective nodes and the larger pieces but they don't deal with things like rain-fade and terrain blocking and actually being in downtown Fallujah, with the dirt, the mud, the grime, the line of sight issues. If we're really going to put together good systems, we've got to have that level of fidelity and resolution. We have to look at the architectures not from the system's view, but from the Soldier's view. If we look at the architecture and say, "What's the best way to set up the architecture to support the WGS satellite?" We'll come up with one solution. "What's the best way to set up the architecture to protect the information in the system?" We may come up with a little bit different architecture.

We need to make sure that as we're putting these things together, we are looking at the systems from the perspective of the Soldier, the Sailor, the Marine, the Airmen — the users — who are depending on this information to save their lives and to execute their mission. When you look back up at the system from that level, you're going to design the system differently in order to support the end user on the far end. We need to look at network centric solutions across the board that converge things together as compared to where we are today. We're just not at that level yet where things can pass seamlessly from

one system across to the other. Within the command, we're looking at things where we can capture near-term spirals, things that give us high payoff and high value as we do that. We're trying to set the conditions for the long-term so that we've got the right requirements out there and can drive things to success over the long run. We've learned in the operations we've had so far that working jointly is the right answer. We've got to get over any service parochialism, any barriers that exist between things right now and put things together in this manner and build them that way from the ground up. ⚠



While deployed in Iraq, LTC James R. Rice and CSM David H. List, of the Mission Support Element, Fort Carson, Colo., stand guard by their vehicle as an improvised explosive device is detonated in the background. *Photo Courtesy Fort Carson Public Affairs*