

Technology leader



Bill Wasel, Raytheon.

Raytheon provides state-of-the-art electronics, mission systems integration, and other capabilities in the areas of sensing; effects; command, control, communications and intelligence systems, as well as a broad range of mission support services. Helen Jameson speaks to Bill Wasel about command and control systems for the military.

Raytheon is a technology leader specializing in defence, homeland security, and other government markets throughout the world. With a history of innovation spanning more than 80 years,

Question: Command and control systems play a huge part in modern warfare. Why are they so important and what benefits do they offer?

Bill Wasel: First of all, command and control is a very broad subject and it can mean many things to many different people. That is one of the main challenges of command and control in the marketplace. It needs to be defined. Command and Control today provides you with awareness that you never had before and this is critical. This awareness is the status of your own forces, the status of the opposition's troops, and awareness of the political or geopolitical environment around you. It's a much quicker conveyance of information from the commanders all the way down to the foot soldiers. So command and control is a heightened awareness. That results, of course, in reducing civilian casualties and also your own casualties.

Question: How have command and control systems changed over the past ten years?

Bill Wasel: There have been a number of changes. Some of the command and control systems, from the US perspective, have been in the field for ten years or more and they have evolved over time. For example, they have more of a Microsoft-style look and feel to them and they execute on very lightweight computers such as notebooks and high-end hand-held devices. So they have got lighter and thinner and therefore can be used by the actual soldiers on the ground. The amount of bandwidth made available to the military has also increased and has been an important development.

Question: Is training an issue? Making sure that all personnel are proficient in using the equipment?

Bill Wasel: That's an interesting question. Most of the young folks who are driving the humvees and are walking on patrol have grown up in the video game era, in the Internet era, so a lot of these folks don't even worry about seeing a manual. That goes for me too – I'm not that young, but if I am given a new piece of software and I start working with it I learn very quickly without a manual sometimes. That's one aspect, but the other is that you obviously have to make sure you are using it per your commander's direction. Training is interesting in that we find that it is not as hard as you might think.

Question: What does Raytheon offer to the military in terms of C4ISR systems? Will these systems be the command and control systems of choice in the future?

Bill Wasel: We offer a wide range of command and control programmes. I could list them but there would be about 15 or 20. For example, the Battle Command System, known as BCS and the Tactical Component Network or TCM. There's also the Co-operative Engagement Capability. There are many, many programs we could discuss.

Question: So, are the programs tailored to the individual?

Bill Wasel: They are tailored to the needs of the individual force such as the Air Force, the Army and the Navy. We also make programs for some other DoD agencies such as the Homeland Security market as well as for the international market. So they are tailored to the service or to the agency and also tailored to the specific user.

Question: How far away are we from seeing a completely network centric battlefield? Do you see this happening in the

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Throughout its more than 80-year history, Raytheon Company has been a leader in developing defense technologies and in converting those technologies for use in commercial markets. From its early days as a maker of radio tubes, its adaptation of World War II radar technology to invent microwave cooking, and its development of the first guided missile, Raytheon has successfully built upon its pioneering tradition to become a global technology leader.



near to mid-term or is it something for the future?

Bill Wasel: Different people tend to have different opinions about this. There is a case to be made that we are very nearly a network-centric force now, but that is from a US perspective. If you are asking do you have an extensive intelli-capable network in place in which you operate, the answer is we're getting there. It's not mid-term and not something for the future. We have a network centric capability now. The question that you'll find different answers to is 'how far down the echelons does network centricity find itself every single day?' For example, what capability does a commander have at his four star headquarters compared to the foot soldier on his patrol. Each will have different levels of net centricity. However, the foot soldier on patrol is getting closer to having more advanced net centricity and is becoming connected to a network so they are getting information as they walk. It is getting there.

The command and control systems that facilitate net centric operations to continue to evolve and I think the network is a bit ahead of the net centric operations, but not that far ahead. One of the biggest changes is greater communications bandwidth being made available all the time. New bandwidth has been put in place over the last few years and that has had quite an impact.

Question: When developing command

and control systems, what considerations do you need to take into account?

Bill Wasel: It's all about user, user, user. In the end, it's about human beings sitting in a chair or walking on patrol, and it's the human being that interacts with the system. The system has to deliver the information in a timely manner with the quality of information that the user requires wherever that user is located, so the primary consideration is to work with the user and to meet their needs as far as you possibly can. Then we go forward to develop those capabilities, to build a little and to test a little – to bring the user into the development and get it right for them. Now the other important thing is the actual interface (what the user sees on their screen). If there is too much complicated data it is useless and too little data is also useless. It must be user-friendly, especially as it has to be used in stressful and dynamic situations.

Question: Raytheon was recently awarded high marks at a coalition warrior interoperability demo. Can you explain the importance of interoperability between systems and how you achieve this?

Bill Wasel: That's a big question so I will break it up into pieces. One of the projects that I am directly involved with is the CHAIN Project, a Critical Communications Management System which received high marks for

interoperability. In a sense, it allows users at various levels of security clearance to access to data, from a coalition perspective, to operate on a single network, on a single system. So whoever needs to have access is automatically permitted to gain access at their particular level. That was the project that we worked with directly.

The importance of interoperability between systems is fundamentally to permit joint operation. For example, you have an Air Force Blue Force Tracking system, a Marine Blue Force Tracker and an Army Blue Force Tracker. You need to have them all working together so that everybody knows where all the Blue Forces are and it is not a trivial thing to achieve. Systems have evolved over time and each part of the military has evolved somewhat independently of each other. The command and control systems for the future are often the ones of today because they tend to stay in a field but evolve and we continually try to solve problems that arise – the issue of blue force tracking is an example.

However, we are heading in the direction of interoperability between systems at the data level so if you would like to know something about the fuel status at an Air Force base somewhere, for example, the database that holds that fuel status information must be interoperable with the army system who would like to know if there is an aircraft on the ground that can take-off. So we are achieving this through data interoperability and that is where the US DoD is heading.

Question: What are the principal trends and developments that you expect to see emerging within military communications in the next year to 18 months?

Bill Wasel: We anticipate the next generation SATCOM and tactical radios to embed additional functionality such as multi-band, crypto and security. There won't be standalone modules, but rather, these will be integrated capabilities into the network. This provides the warfighter with size, weight and power advantages to achieve mission dominance. Additionally, Raytheon continues the transition from black box manufacturing to the broader role of a solutions provider across the communications spectrum - from secure communications to satellite broadband to wireless and software oriented architecture - a more integrated solution.

Question: What are Raytheon's primary objectives for 2008?

Bill Wasel: The primary objectives for Command and Control in 2008 will be to understand and develop the way forward with Service Oriented Architecture capability or SOA. So from the standpoint of moving forward in the world of command and control it will be the evolution and ultimate implementation of SOA in the context of command and control. ■



Raytheon Company has provided Multi-Band Multi-Mission Radio (MMBMR) systems to the United States Special Operations Command (USSOCOM). Photo courtesy of Raytheon.