Satellite communications on the move: Is everyone's requirement the same?

by CPT (P) Vincient J. Colwell

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The Army user desperately needs a command and control on-the-move (C^2OTM) capability to support the idea of a leaner, meaner force rapidly deployable world-wide.

So what is C^2OTM? Ask a dozen people and you will get a dozen answers. Not only that, if you find a comprehensive definition of the required capability, where do you go from there? What is the future? In trying to pin down a definition, you might find that supporting the mobile force does not require that everyone communicate while actually moving. There are some elements that must halt for a short time to do their missions. And...?

We need to take a hard look at what we actually accomplish as part of the battle command process. Then we need to express that process so that it not only defines what we want but where we are headed. The development community will then be able to take that requirement and develop systems that provide value-added to the process. This applies to both the full developmental processes and the off-the-shelf commercial leveraging.

Defining the problem

There has been much conversation lately about the acquisition community's ability to field new technology and new systems. Critics take great pains to point out the flaws of the bureaucratic system. For example, the acquisition process has produced systems with outdated technology arising from the delay between design and fielding. We would all agree that the acquisition system is in need of some overhaul. Yet there is more to the problem than the bureaucratic process.

Part of the problem is that the user community does not know how to adequately define their operational requirements in terms that will drive the industrial community to develop the kinds of systems we need to accomplish our mission. We talk about vision, partnerships with industry and leveraging commercial technology, yet we habitually define our needs in terms of some present technology with which we have become

enamored rather than the needed operational capability.

The reduction of resources available to accomplish the mission, which is escalating, causes us to look for better ways to do the things we now do. We look to replace our losses with more efficient operations. This is not a new or significant challenge when the issue is strictly efficiency of base level or lower order tasks. We adjust training, modify systems, and absorb new technology every day. Making a weapon system shoot farther, faster, and do more damage is straightforward and largely a linear development process. It becomes more difficult when the task is more complex.

Making a system of systems better, allowing many tasks and applications to occur simultaneously and under varying sets of conditions is no mean feat. The issue is not just compiling many tasks under one overarching operating system and making them all work simultaneously and efficiently. As we move from base level tasks to higher order tasks, defining what must be done and under what conditions becomes more challenging. It is not as easy as saying we want to do everything, everywhere and under all conditions.

Doctrine

FM 100-5 describes the need to allow the commander and staff rapid access to information and intelligence. The definition of rapid access is difficult in that it does not differentiate between the type or kind of rapid access required. There is no time standard assigned to the definition. What is rapid? Some rapid access requirements are understood by all as the immediacy of the commander's push-to-talk radio systems. However, this type of access is not necessarily the same that is required by other members of the staff, and even among the various members of the staff.

The differentiation can be defined by the operational profile of the different staff elements. Command activities must be accomplished whatever the action of the commander. In the strictest sense of the terms, some actions cannot be accomplished on the move. Administrative and logistics operations are not conducive to a strict on-the-move definition. In reality, the need for these staff elements is communications at the pause. Although they still support a mobile battle and although they operate within a moving combat force, the actual operations are accomplished at the pause, or short halt. In these operations, the communications must be available within minutes (not hours) of a unit's arrival into a given position. It takes time, although very little, for these elements to get into operation once they halt.

The communications support for the differing operations is just as divergent. The commander and the supporting S-3 operations element require immediate assured access to the combat forces and intelligence elements in support of the current operations. Most of the communication service required are voice and lower data rate text and graphics. The information is critical, specific to the current operation. Commanders at this level are not interested in minutiae. They need a *skim and dump* presentation of the facts of the battlefield in the simplest, most easily digestible and complete form possible. They must get a comprehensive picture of the battlefield in a very short time. The fight of the immediate battle or operation at hand requires commanders to have a full understanding of the current picture of the battle space for which they are responsible. Obviously, this all must be done without unfavorably affecting the commanders' mobility. This is the classic C^2OTM requirement.

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The communications support for other elements of the staff is no less important; however, the conditions under which it is accomplished are much different. The supporting elements do not accomplish their support of the current operations on the move. They are either as mobile or nearly as mobile as the commander and the current operations elements to keep pace with the operational tempo (OPTEMPO) of the mission. They must stop, halt, and pause to accomplish their assigned tasks. Tanks and armored fighting vehicles cannot be fueled while underway. Meals cannot be

UHF SATCOM on the move during Somalia Operation, 1993.

prepared, nor can soldiers be fed while moving. Maintenance cannot take place on the fly. Medical attention cannot be done on the move--save for on a stable platform, like a helicopter or a wheeled vehicle on improved surface roads. The planning function for the next operation could be accomplished on-the-move, but the staff coordination and networking that is required would be best accomplished at the halt. Having a conference in a moving Bradley is not the way to do business. Yet.

Defining differentiated capabilities

When the two differing operational mission profiles are compared, the analysis reveals that while all of the actions must take place on the mobile battlefield, there is not a requirement for all actions to be accomplished on the move. The differentiation is that some requirement is for mobile communications at-the-pause (CTAP).

Communications systems for a C^2OTM capability require a minimum of low to low/medium data rate capabilities. The immediate need is for secure voice communications and some data (primarily character related). The future requirements will include operational graphics, still imagery, and potential full (or near full) motion video.

Mobility must be equal to the elements being supported. The ideal situation is that the communications system is integrated into the commander's fighting platform. The systems must be able to be in operation at all times. The communications systems would be integral to the platform and the operations of that platform. The antenna or external portions of the system should conform to the platform design, unobtrusive to other operations, and survivable in a combat environment. Operations of the equipment would be non-intrusive to the commander's other responsibilities. The more the system is operationally transparent, the more value is added and the easier it is for the commander to maintain a high OPTEMPO. The system becomes a value-added part of the command process (combat multiplier).

If the user portion of the system operation is totally hands-off and provides graphics capabilities on a heads up display, all the better. At the pause, the wireless tactical command post would

enhance the flexibility of the system.

The supporting communications service for CTAP would include any type of service available, and would require higher data rates than the command and control elements because of the higher information needs. Staff elements are interested in the minutiae of the overall situation. They get paid for the details. The success of the next operation is based on their efforts and their ability to provide the commander with accurate assessments. The critical part of the equation is the availability of the communications. Supporting communications means must be as mobile as these elements, and available when these elements are prepared for operations. So in most cases, communications that are available within minutes of these elements arriving on site fit the bill. While they are as mobile as the supported elements, and these sections are supporting mobile operations and a high OPTEMPO, they are not required to operate on the move.

Summary

The only absolutely required C^2OTM capability required by the support elements is that the commander must be able to execute the control function as the situation demands. Changes of orders and changes of mission would, in most circumstances, be voice or textual. The service required could be satisfied by single channel radio systems or paging services. Both options are easily implemented. Both options are compatible with on-the-move and at-the-pause systems.

The communications systems for CTAP capability require medium to high data rate capabilities. Mobility must be at least that of the majority of the elements being supported. Systems must be able to be up and in operation within minutes of the halt. While conformity with and obtrusiveness on a given vehicle or platform is not a driving factor, combat survivability requirements must remain intact. The connections to the communications systems would probably be the responsibility of the individual user. As an aside, the wireless tactical operations center would make this action essentially painless.

We need to test the concept with off-the-shelf or nondevelopmental items through the Battle Lab process to achieve two goals: further define the requirements for C^2OTM and CTAP, and leverage research to improve the procurement process. In the technological free-fall we are in now, technology is turning over in some areas, particularly communications, in as little as eighteen months. What we must do is look at how we want to fight, define our direction and desires clearly, and leverage a combination of the development process and off-the-shelf technology.

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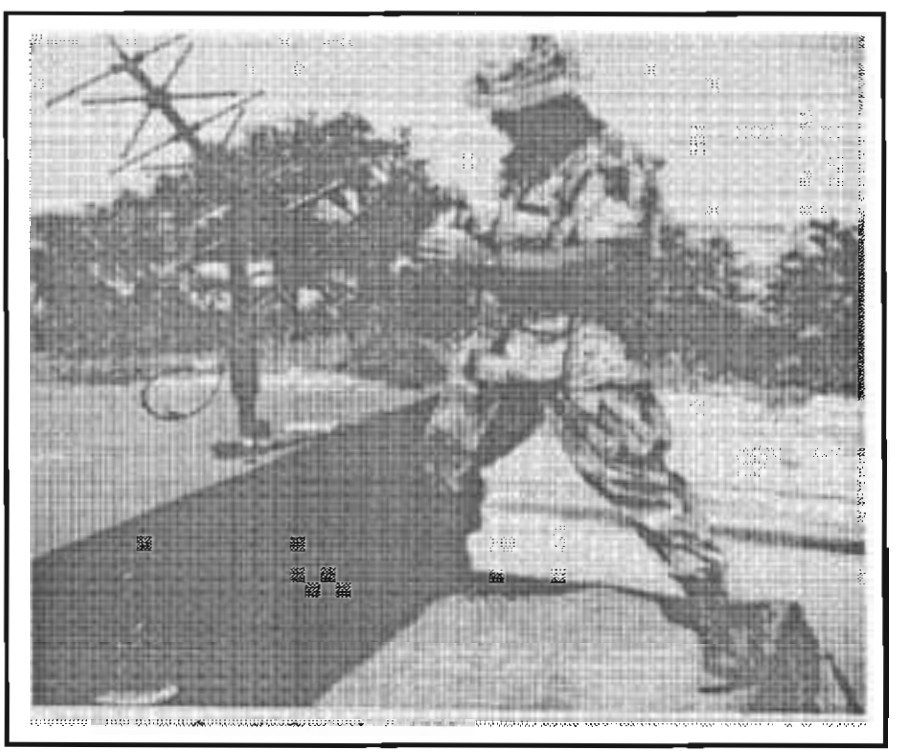

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