

MLOS improvement on the front line

By CPT Christopher J. Kittle

Currently serving as the S6 for the 3rd Squadron, 7th U.S. Cavalry, deployed to Afghanistan in support of Operation Enduring Freedom 12-13, the ability to communicate over long distances is my primary focus.

The mountainous terrain, developing infrastructure, and reduction of U.S. and Coalition Forces have placed greater demands on communicators to extend the network and support commanders with distributed or decentralized mission command.

The means available to execute mission command are constantly evolving and being redefined, often heavily influenced by the introduction of Commercial-Off-the-Shelf equipment to fulfill specific needs.

With a wide range of communication systems being utilized throughout the Combined Joint Operating Area-Afghanistan, the question remained: given the resources available, how can communications at the Troop level be improved within 3-7 CAV?

More specifically, how can the redundancy for data and voice services be improved? The answer was found using the Microwave Line of Sight transmission system that would eventually become the gateway to strategic level communications resources at remote Combat Outposts

throughout Regional Command-North.

3-7 CAV deployed from Fort Stewart, Ga., in late August 2012 to RC-North. Prior to deploying, the unit conducted its pre-rotational training at the Joint Readiness Training Center, Fort Polk, La.

One of the primary focii of the training at JRTC was ensuring the capability to execute decentralized missions. This meant that troops were not centrally located at one FOB, but geographically spread throughout the Area of Operations at several smaller COPs.

Consequently, this increased the role of communications Soldiers at both the Squadron and Troop level. While at JRTC, the communications Soldiers were able to train on the Command Post Node and gained some functional experience with operating the SIPR/NIPR Access Point system. Excluding the basic SNAP introduction, the training at JRTC was executed with organic communications equipment. The training the communications Soldiers did receive on the SNAPs proved to be very important as the Squadron would be spread throughout three provinces in RC-North.

Once 3-7 CAV deployed to RC-North, the size of the AO the Squadron encompassed proved to be a key factor in executing the mission. Digital connectivity, broken down into voice and data,

is necessary for many of the day-to-day operations units execute. Thus, digital connectivity can become a crux for success for everything ranging from large scale tactical operations to routine logistical support.

At the beginning of the deployment, the Troop's primary source of digital connectivity was the SNAP. The SNAP is a very common communications system in use throughout Afghanistan for smaller and more remote elements. The SNAP also operates on the "tactical network" which provides the necessary connectivity but is generally not as robust as that of the higher echelon "strategic" networks.

It is a satellite-based system that is very easily affected by the weather. While the system was able to meet the basic needs of the Troops to execute their mission, the system provided little redundancy and service interruptions, for a variety of reasons, were fairly common.

As many other units have experienced, even while operating the SNAP at its optimal capabilities, the limitations were clear. Because of the limits of the SNAPs the benefits of a transmission system such as the MLOS became increasingly apparent.

Through the first several months of 2012, the MLOS network continued to expand

throughout Afghanistan and, more importantly, into locations throughout RC-North. This happened to coincide with the arrival of 3-7 CAV to RC-North in late August of 2012. Thus, by the time 3-7 CAV arrived in theater the MLOS network was fully functional throughout RC-North. The MLOS was not initially installed for the purpose of directly supporting the local elements at the COP with end users for voice and data services.

While the MLOS was fulfilling its intended purpose, the potential of this system was not being realized. The MLOS also created another unique situation where a strategic level transmission system was located at remote COPs that were accustomed to only tactical level communications. Another key factor with the MLOS was that the system did not have additional higher echelon communications support personnel and equipment physically co-located with it, such as a Technical Control Facility or a Network Operations Center. As most strategic level transmission systems are co-located with personnel who support the system, this would present a significant obstacle in providing additional services to the Troops. Overall, this created a unique situation where a fully functional strategic level transmission system was being underutilized at locations which could benefit from improved data and voice services.

As is common with most strategic level systems, the MLOS and the network it accesses provided much more than what the Troops were accustomed to using. The MLOS is a terrestrial based transmission system. In some respects, the MLOS is similar to the tropospheric scatter systems already in use by the Army. The MLOS system was implemented in Afghanistan during the previous three years, forming a 'ring' of connectivity around the country.

The system currently in use is contracted through the Afghan Wireless Communications Company. The capabilities of the MLOS separates itself from the SNAP systems in several ways: its available bandwidth across the three enclaves, NIPR, SIPR, and CENTRIXS, out-performs a SNAP; it can significantly increase the available number of users without saturating the bandwidth; it is a terrestrial-based system that does not require connecting with a satellite and the associated impacts of weather; and the additional higher echelon support that the systems receives, even if remotely, increases the potential of the system.

In addition to these attributes, the MLOS provides a different method to transmit the signal which gives the Troops two distinct and redundant systems for

digital voice and data. Once the capabilities of the MLOS were fully realized the process of establishing services began.

The two primary elements that continue to assist and maintain support for the MLOS system are the Regional Network Operations Control Center-North, and the theater signal support element, the Joint NETOPs Control Center-Afghanistan. JNCC-A is a Task Force Signal asset charged with providing Mission Command to Echelon Above Division Signal forces and network operations in order to provide communications networks, information systems services support and information assurance for U.S. operational forces in the CJOA-A. (<http://jnccportal/SitePages/Home.aspx>)

In addition to the network control centers, the Direct Signal Support Team of the 580th Signal Company, located at Camp Marmal in RC-North, provided support with programming and making workstations fully mission capable. Most elements of signal support are maintained at the regional NETOPs center, for both strategic and tactical, but with strategic level resources, more support is needed from the theater level.

The ability of the squadron S6 to coordinate higher echelon signal support and, on occasion, enable the RNCC-N and JNCC-A direct coordination with a communications Soldier at the Troop level, allowed this project to progress and ultimately succeed in supporting the end user. With range of the signal support assets available in RC-North and throughout Afghanistan one problem still remained: how can a strategic level transmission system, the MLOS, support users where higher level signal support was not physically co-located with the Troops?

The ability to operate the SNAPs with just one or two Soldiers is the primary advantage of the SNAP for operation at the Troop level.

Conversely, for basic operation the MLOS is also able to be operated by one or two Soldiers at a COP, to include tasks such as connecting users to switches. The physical shelter is maintained by AWCC, but the components that provide network access are controlled by U.S. forces. The combination of the two, the shelter and the components, is what makes the MLOS such an excellent system for remote locations. The communication Soldiers for each COP were tasked with physically installing the new switches and encryption devices into the existing router.

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This is significant because the access to all three networks, NIPR, SIPR and CENTRIXS, required the network engineering to be executed after the equipment was already in place. All the tasks necessary to establish the MLOS system were completed by the Soldiers on the ground working remotely with the RNCC-N and the DSST. This included everything from establishing trunks, programming switches and routers, developing IP schemes for voice and data services, and the many other system processes that are required in order to support a modern Command Post. The level of responsibility and complexity of this project fell directly on the shoulders of the 25B's located at the COPs.

As the project progressed, unforeseen issues often arose which could not be remedied remotely. This required the Soldiers at the COPs to find a solution through local trouble shooting with remote assistance from the technicians of the DSST or RNCC-N.

One competent technician could positively affect three different locations spread throughout three mountainous provinces in just a matter of minutes. Conversely, after the hardware was installed, there was no "how-to guide" or "smart book" for Soldiers and technicians to reference while creating the digital infrastructure required to bring an MLOS system on-line.

The two communications Soldiers at each Troop, one 25U and one 25B, did not have the opportunity to experience working on the MLOS (like they did the SNAPs) prior to deploying. While some of the equipment was familiar to them, not all switches are the same when a Soldier is moving between

maintaining the tactical network connections and establishing a new strategic network to the end users. Overall, the project of establishing the MLOS at the Troops showed how higher echelon signal support can directly impact users at the Troop level operating at remote locations throughout Afghanistan.

Improving the communication resources available to Troop commanders allows them to spend more time focusing on their mission and not questioning whether their communications are adequate to complete the mission.

The MLOS significantly increased bandwidth and the redundancy by providing two separate transmissions systems for secure voice and data.

The ability of multiple entities to work together during the process of establishing and maintaining services at the COPs shows how knowledgeable technicians and motivated Signal Soldiers can greatly improve tactical communications down to the Troop level.

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ACRONYM QuickScan

AO - Area of Operations
AWCC - Afghan Wireless Communications Company
CF - U.S. and Coalition Forces
CJOA-A - Combined Joint Operating Area-Afghanistan
COP - Combat Outpost
COTS - Commercial-Off-The-Shelf
CPN - Command Post Node

DSST - Direct Signal Support Team
JNCC-A - Joint NETOPs Control Center-Afghanistan
JRTC - Joint Readiness Training Center
MLOS - Microwave Line of Sight
NETOPs - Network Operations
NOC - Network Operations Center

RC-North - Regional Command - North
RNCC-N - Regional Network Operations Control Center-North
SNAP - SIPR/NIPR Access Point
TCF - Technical Control Facility
TROPO - tropospheric scatter systems
3-7 CAV - 3rd Squadron, 7th U.S. Cavalry