Cyberspace Network Management Technicians (MOS 255N)

By CW5 Todd M. Boudreau

(For a more complete understanding of the development of MOS 255N, read the article on MOS 255A in this edition of the Army Communicator on page 24.)

Where We Were

We had to address the question "What is a warrant officer MOS?" in the process of repurposing our current MOS. Branch officers have areas of concentration and enlisted Soldiers have MOSs. Warrant officers have both. A warrant officer MOS is comprised of a two-digit branch identifier (e.g., 25 for Signal), a third digit to define an AOC (e.g., 255 for Network Operations), and a fourth alpha character to finally comprise a warrant officer MOS (e.g., 255N for Cyberspace Network Management Technician).

The MOS 250N was created in 1998 and subsumed MOS 250A and 250B in April 1999. It then remained relatively stable until September 2000 when all COMSEC functions were transferred to newly created MOS 254A and all CW5 positions were transferred to newly created MOS 255Z. Since then, no major changes have taken place other than the inclusion of newer transport and routing technologies.

Looking back at our legacy Signal warrant officer MOS, we in fact had four AOCs: (1) 250, Network Management; (2) 251, Automated Information Systems Operations; (3) 254, Signal Systems Support Operations; and (4) 255, Signal Systems Operations. Each AOC had only one MOS. The decision was made to repurpose AOC 255 to Network Operations and then place all four MOS under this one AOC. This becomes more significant as we recognize the correlation between the interdependencies of the three elements of the NetOps construct and the interdependencies of the three base Signal warrant officer MOS as indicated below.

Where We Are Heading

Below is the NetOps construct on the 255A that shows its three elements and how the repurposed MOS matches each. MOS 255Z remains our capstone Signal warrant officer MOS and thus the senior MOS that acts to ensure, shape, and enable NetOps on the battlefield. MOS 255A is responsible for cyberspace content management while MOS 255N (Network Management Technician) is responsible for Cyberspace Network Management. Later articles will detail how MOS 255S is responsible for Cyberspace Defense and MOS 255Z is responsible for Cyberspace NetOps (CyNetOps) in its entirety. Because these three

are 'elements' and not 'enablers,' NetOps does not exist unless all three are in play. The purposed overlap indicates higher-level NetOps functions within an element that is either supported by or supports another element. Further elaborating on the former, I use Computer Network Operations as a comparison. CNO has three enablers, Computer Network Attack, Exploitation, and Defense (CNA, CNE, and CND respectively). As enablers, CNO will continue to exist without CND, however, it is not fully enabled. Conversely, CyNetOps does not exist is one of its elements is missing; similar to the removal of an element of hydrogen from H2O, you no longer have water, you now have chemical compound HO. Just as water exists in the bonded mixture of H2O, CyNetOps exists in the bonded mixture of CyCM, CyNM, and CyD. It is the interrelationship of these three that births CyNetOps. Finally, these interrelationships form shifting supported and supporting responsibilities that must be understood and fostered by full spectrum CyNetOps.

MOS 255N, the second of two enlisted-level accessions MOS, is the Army's premier network transport technician responsible for voice, video, and data networks, establishing and maintaining the transport layer environment of Army's portion of the cyberspace domain through Network Management/Enterprise Systems Management (NM/ESM) functions to include fault management, configuration management, auditing and accountability measures, maintaining performance standards, and implementing security measures at all levels in support of combat information superiority and command and control. In short, the 255N owns CyNM.
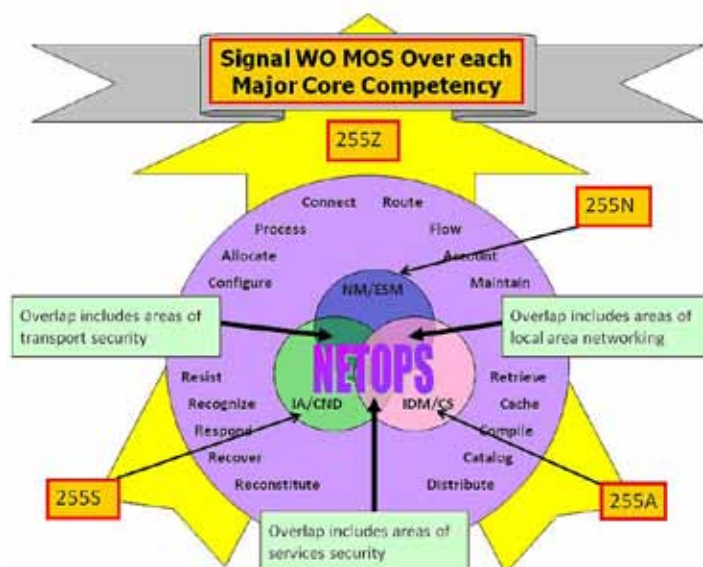

Diagram 1

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I make the same caveat that I offered to the objective 225A; we are a formation still in motion. Doctrine, organizational designs, current systems and equipment, and legacy leadership ideology may still lag behind the below ideal and objective description of MOS 255N. As in MOS 255A, we are not able to make an immediate right flank, march.

 Here too we are in the beginning of a column right, meaning you will wind some units who are able to immediately able to receive newly trained 255A, N, and S and employ them as detailed within this publication; they have already made the turn. Other units, however, will find themselves further back in the formation.

Apprentice Cyberspace Network Management Technicians

To understand the apprentice level warrant officer, an understanding of the transition from Noncommissioned Officer to warrant officer fostered by attendance at the Warrant Officer Candidate School is helpful. WOCS continues to evolve to better align its philosophy and activities to meet the needs of an Army at war. The driving force is the desire to produce warrant officers better qualified to operate effectively in the demanding operational environment.

Following is a synopsis of the changes made in 2006 and the resultant WOCS in operation today.

While WOCS has adjusted and evolved through the years, 2006 marked another such notable year in its development. WOCS has always been associated with its physical rigor. Prior to 2006 physical training heavily focused on the Army Physical Fitness Test. An increase from entry level APFT scores to graduation APFT scores was a significant metric used to gauge its success. Goals included a desire to improve physical fitness, to improve candidates' understanding of the elements of fitness, and to prepare them to assist with their commander's fitness programs. Subsequent to the 2006 changes, PT became more warrior tasks and battle drills centered. The current goals of the WOCS APFT are to maintain and/or improve a candidate's state of combat readiness and to develop both foundational fitness and fundamental skills to prepare the officer leader for operational deployment.

The focus of the WOCS has gone through significant changes. Prior to 2006, many have said the course had a barracks centered focus. AC-RC differences along with the limited resident only training rendered its purpose and effectiveness questionable. Subsequent to changes made in 2006, most now say WOCS is developing officers. The inclusion of a distance learning phase to build experience and its field leadership exercise has added a credible amount of increased rigor.

As outlined on the Warrant Officer Career College website, the current WOCS focus emphasizes officer roles and responsibilities more, and individual activities less. Candidates are required to meet high standards for maintaining their personal living areas. However, the standards

Diagram 2

are based on the need to maintain a clean and orderly living environment rather than what many in the past perceived as arbitrary specifications designed to heighten stress levels.

There are experiential learning events throughout the program, particularly warrior tasks and battle drill related activities that provide leadership opportunities while emphasizing lessons relevant to the OE. These activities culminate in a FLX that draws heavily on recent lessons learned. This capstone event provides candidates expanded opportunities to apply flexible, adaptive leadership principles in stressful, sometimes ambiguous, situations to reinforce and build upon previous classroom theory studies and discussion.

Training, advising, and counseling officers and academic instructors concentrate primarily on training and secondarily on assessing candidates' performance. This becomes apparent in the time and effort TACs and instructors devote to serving as role models, mentors, and coaches. Throughout all the changes, rigor is maintained—even increased—and the goal continues to be to provide candidates the foundation they need to succeed as warrant officers in a changing Army, and to be adaptable to the ever increasing challenges of the OE.

Having successfully completed WOCS and being appointed to WO1 in the U.S. Army, the junior 255N (i.e., W1 and W2) focus on acquiring and refining technical and administrative skills as they supervise and manage the operation and internetworking of telecommunications networks, networked information systems and equipment, networked transmission and transport systems, network management platforms, and associated personnel at both the local and wide area network level. Their focus is also mainly on the equipment and systems and how to leverage them to assist their commander to prosecute the wartime mission.

The apprentice CyNM averages 10 years active Federal

service with a minimum of four years documented practical experience in voice and data internetworking, local and wide area networks, and/or network planning. Additionally, he/she is most likely a prior staff sergeant and must minimally have at least 36 months of documented rated time as a leader as evidenced by official NCO evaluation reports.

The junior CyNM begins learning each and every 'subject' within the 'system.' As in the 255A, a WO1/CW2 255N, the "primary focus is becoming proficient and working on those systems linked directly to AOC/MOS" (DA Pam 600-3). During the initial assignment is the time for the junior CyNM to develop a foundational understanding of the devices and applications used in his/her system. Where they are assigned and how they are utilized will greatly impact their future careers. Accordingly, similar to the CyCM, the apprentice CyNM is nominally assigned to a brigade combat team where he/she has the greatest ability to encounter the widest array of devices and applications found within the breadth of his/her assigned systems. After five months in WOBC, the BCT provides the best opportunity to see his/her system put to use by its intended user – the combat commander. The astute apprentice CyNM uses this opportunity not only to provide the foundational training and experience in communications transport and networking systems that he/she will build upon throughout his/her career, but also becomes aware of the systems tactical purposes. He/she learns how

to converse not only in IT communities, but also the tactics, techniques, procedures and vernacular of the combat arms community he/she enables.

The WO1/CW2 255N focuses on the install, maintain, and operate aspects of the system in which they are responsible. They are to focus on the individual pieces of their system, many of which they were trained on in their WOBC. Examples of such devices and applications in today's Army inventory includes (but is not limited to) VoIP call managers, firewalls, routers, switches, multiplexers, voice switches, various RF transmission systems, network management software, etc. Shifts in technology have begun to cause a shift in responsibilities that are covered under the MOS repurposing strategy of the Signal warrant officer. For example, tactical tadio communications systems have begun to become networkable devices meaning they are IP-enabled, node/PoP-self creating devices that inherently create cyberspace transport as they are operated. As such, they shift under the responsibility of MOS 255N. This shift causes the 255N to focus on transport, regardless of WAN or LAN architecture. However, information assurance activities have not, nor will they ever, shift to MOS 255S. MOS 255A Soldiers are fully responsible to posture their systems and ensure they remain compliant to all IA policies, practices, and governance.

Another example of a shift in capabilities that has second and third order effects to include influencing Signal warrant officers is that of frequency and spectrum management. In the past, select Soldiers were trained in frequency and spectrum manage-

Senior warrant officers are immersed in the latest technology and most advanced systems when they attend their Professional Military Education course at the Warrant Officer Career College.

ment, awarded additional skill identifier D9, and placed in our formations where these skills could be best leveraged. Today, the electromagnetic spectrum has become such a critical component of our portion of cyberspace that the level of training at an ASI producing course, along with the inability to track and ensure full utilization of personnel trained in such skills, does not meet the criticality and full spectrum of the requirement. EMS operations includes not only EMS management, but also incorporates electronic warfare and electronic protect. As such, an MOS is required to ensure EMSO as a whole is fully synchronized; MOS 25E, Electromagnetic Spectrum Manager has been created to synchronize EMS management to include cyberspace operations in and through EMS as well as EW operations and EP actions. However, MOS 25E will be an asset to the 255S as that is where the bigger view of the network is taken. This leaves a gap in frequency and spectrum management which must be filled by our 255N.

Journeymen Cyberspace Network Management Technicians

The Mid-grade MOS 255N (W3) focus beyond the individual assemblages and systems to acquire skills in the individual attributes of CyNM (i.e., the science of NM/ESM) as well as the intricacies of the interrelationships with the other NetOps elements. This development prepares them to be true experts in their craft and advisors to senior leadership on complex and complicated NetOps issues.

Journeymen CyNM, similar to their CyCM counterparts, as advanced-level technical and tactical experts, now step slightly away from the devices, applications, and even the system they oversee and begin to seek an in-depth understanding of the principles and science behind their systems. Having gained expert experience in how these devices operate, they learn the deeper answer to why they were developed and how they are leveraged to transport data and information, or better yet, command and control.

The journeymen CyNM is also nominally assigned to a division or corps where he has the greatest ability to focus on the bigger picture. Still remaining close to the devices and applications within their systems of responsibility, they find themselves moving past the install, maintain, and operate mission and become involved with the planning and engineering of transport services and enterprise level network management for larger organizations. In preparation for the demands of such assignments, these CyNM will attend the 255N Warrant Officer Advance Course.

Prior to WOAC attendance, enrollment into the Action Officer Development Course (131 P00) must occur after promotion to CW2 in order to qualify for WOAC Prerequisite Studies credit. Journeymen 255Ns attending their resident WOAC will find project management and enterprise level transport systems and integration, along with advanced routing, VoIP, security, QOS techniques, and transport systems as key technical components taught to prepare him to fulfill their ever expanding duties. The Army senior leadership has taken a renewed interest in warrant officer Professional Military Education. ALARACT 362-2010, Officer and Non Commissioned Officer PME Backlog Definitions, specifically calls out warrant officers stating, "All AC and RC warrant officers will complete WOAC prior to promotion to CW3." This ALARACT also states the requirement to attend WOSC prior to promotion to CW4 and the WOSSC prior to promotion

to CW5. More on this subject is covered in the article on the Army's senior cyberspace network operations technician – MOS 255Z on page 48.

The journeymen CyNM's credibility is very high in such organizations and the influence they have cannot be underestimated. Mentorship of apprentice CyNM becomes an inherent part of their duty description. They also begin to gain more uniformity in the supporting and supported roles of their peer Signal warrant officers, the 255A Cyberspace Content Management Technicians and the 255S Cyberspace Defense Technicians. No longer do they focus their duties and responsibilities on their systems solely. Now they begin to fully understand that the transport networks they are entrusted to establish, maintain, and manage are meaningless if they fail to move data and information to the intended destination and/or become exploited or manipulated by a cyberspace adversary. Journeymen CyNM seek out professional forums to ensure they remain informed on technology advancements and trends as well as opportunities to further their educational training through university courses and civilian certification programs.

Finally, some journeymen CyNM may, similar to their peer 255As, feel a pull toward the Cyberspace Defense arena. It is at the beginning stages of his journeyman phase (senior CW2 or junior CW3) where one may make the decision to move from the CyCM to the CyD realm. The future decision point will normally be just prior to WOAC attendance. The expected prerequisites for such a transition along with the planned board process will be discussed in a later article.

Master Cyberspace Network Management Technicians

Senior 255N (W4), having mastered assemblages, systems, and CyNM attributes, move from the outer edges of the CyNM circle in the NetOps venn diagram toward the center. They are now moving from mastery of one element toward the goal of W5--mastery of NetOps. While definitively a master CyNM, CW4 255N also serve as "technical leaders, sustainers, and advisors" to the commands to which they are assigned.

Master CyNM, as senior-level technical and tactical experts in their chosen field, have also gained familiarity with the other two elements of NetOps (i.e., CyCM and CyD). As they continue to develop as CW4 255N, they go beyond understanding the basic concepts of assured information delivery and assured system and network availability and ensure that these attributes of NetOps are obtained. As in master level CyCM, while there is never an expectation of finger-pointing between the three associated skillsets and/or MOS, master CyCM takes ownership of these concepts and relationships (as do each of our Signal warrant officer MOS) and in the absence of each sister MOS, takes charge. When all three MOSs are present, the conscious shared desire for synergy is the goal.

The master CyNM is nominally assigned to a Corps, ASCC, or higher level organization where his/her training and experience has its greatest impact. To prepare the CW4 255N for the duties and responsibilities encountered at these levels of organization, attendance at the Warrant Officer Staff Course is crucial.

Diagram 3

The master CyNM is the Army's premiere resource of intellectual capital ensuring the Army meets its future demands throughout cyberspace. We are facing a crisis. Commercial technology has easily outpaced the technology used by the Department of Defense. Our war fighting commanders have expressed their recognition of the value of leveraging new technologies on the battlefield. Within the DOD, cyberspace security and defense are a matter of life and death in some cases. Therefore, we must make wise decisions when adapting and leveraging new technologies. Furthermore, we cannot shirk from the responsibility to ensure our Armed Forces have the best capabilities when they enter into engagements.

Subsequent to promotion to CW5, the master CyNM become part of an ever smaller, elite group of Signal warrant officer, the Cyberspace Network Operations Technician, MOS 255Z. For further information on MOS 255Z, an article summarizing the career paths and describing the skills, attributes, duties, and responsibilities is included on page 48 of this edition of the *Army Communicator*.

Join the Discussion
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Acronym QuickScan

AC – Active Component
ALARACT – All Army Activities
AOC – Area of Concentration
APFT – Army Physical Fitness Test
ASI – Additional Skill Identifier
BCT – Brigade Combat Team
CyCM – Cyberspace Content Management
CyD – Cyberspace Defense
CyNetOps – Cyberspace Network Operations
CyNM – Cyberspace Network Management
CyNOT – Cyberspace Network Operations Technician
DoD – Department of Defense
EMS – Electromagnetic Spectrum
EMSO – Electromagnetic Spectrum Operations
FLX – Field leadership exercise
IA – Information Assurance
IP – Internet Protocol
IT – Information Technology
LAN – Local Area Network
MOS – Military Occupational Specialty
NCO – Noncommissioned Officer
NCOER – Noncommissioned Officer Evaluation Report
NetOps – Network operations
NM/ESM – Network Management/Enterprise Systems Management
OE – Operational Environment
PME – Professional Military Education
PoP – Point of Presence
PT – Physical Training
QOS – Quality of Service
RC – Reserve Component
RF – Radio Frequency
TTP – Tactics, Techniques, Procedures
TAC – Training, Advising, and Counseling
VoIP – Voice Over Internet Protocol
WOAC – Warrant Officer Advance Course
WOBC – Warrant Officer Basic Course
WOCS – Warrant Officer Candidate School
WOS – Warrant Officer Service
WOSC – Warrant Officer Staff Course
WOSSC – Warrant Officer Senior Staff Course
WT&BD – Warrior Tasks and Battle Drills