



COMMUNICATION IN THE ARMY

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Abstract

Communication is when the sender sends a message which is received at the receiving end. Communication in the army needs to be effective to improve the results. Effective communication needs to be short, fast, straight to point and spoken without any disturbance.[6] Communication plays a vital role in the army. The method of communication has evolved over the years. The communication used by the military system should be the one which is suitable for use on land.

Keywords: *communication, technology, wireless , network, electromagnetic spectrum*

Introduction

The current communication method used seems to be wireless communication or 5G. It is the most effective today as it can travel through a large area using waves (electromagnetic spectrum). There is a conference held every year at New Jersey called Network Modernization Experiment or NetModX 20. It is held every year in order to develop new technologies for the communication in the army . There are various tests which the equipment or technology developed have to go through.[5]

Theory

Mission critical networks enable intelligent and automated operations. To be able to act quick in time you must be able to exchange accessible data in short time efficiently with high speed. [2]

With 5G in defence system it will be easier to adjust to industry 4.0 technologies. This will enable to create automate reliable, secure and scalable communication networks across all operating areas. The advantages of this would include faster innovation system with improved command, control, computing, communications, cyber, intelligence, surveillance and reconnaissance or known as the C5ISR system [2]

For the army on the basis of communication 5G could improve ISR systems and signal processing, enable new command-and-control applications, and streamline logistics. 5G also could give the military access to augmented and virtual reality used in ICT.[2]5G smart warehousing distributes command and control and the use of dynamic spectrum.[1]

To do all this, 5G will operate on three segments of the electromagnetic spectrum:

Low band, which works at frequencies below than 1 GHz;

Mid band, which works at frequencies between 1 GHz and 6 GHz; and

High band, or called as millimeter wave which works at frequencies between 24 and 300 GHz.



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With the help of high bands use of millimeter wave, this allows faster data transfer rate which most telecommunication companies think is necessary for autonomous vehicles like virtual reality (VR)

However there are some disadvantages of it. The RF signals in 24-300GHz can be easily absorbed by rain or disrupted by physical object like building. With that the 5G millimeter also requires installing many more cell sites than those working in the lower band. Installing more cell sites also comes at a higher cost and will take more time for development than the sub-6 approach. The 5G deployment will rely on millimeter wave technology for high speed, high bandwidth communications and on sub-6 signals for nationwide coverage [1]

Experimental

The Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) Center – a part of Army Futures Command's Combat Capabilities Development Command (CCDC) – will test potential vulnerabilities within systems being developed for use by the Army[5]

The result of the experiment will allow the C5ISR Center's collaborative partner, Program Executive Office Command, Control and Communications-Tactical (PEO C3T), to take decisions concerning Capability Set 23 – a collection of network capability enhancements informed by experimentation, demonstration and direct Soldier feedback, scheduled to be fielded in 2023[5]

THE C5ISR also aims to leverage multi layered architecture within the communication network. The same aim for the capability test 23.[5][3]

RESULT

Technology which was developed as a part of CAPSET 23 is the modular communication node-advance enclave or known as the MCN-AE which enables soldiers the ability to communicate over secure network.[3]

The MCN-AE augment an existing intelligence network allowing users to connect all their resources they were using when working for the traditional standalone network but now for the army tactical network. Each of the MCN-AE fits into a portable suitcase sized case reducing the traditional system weight and power requirements.[3]

In the traditional system soldiers which performed tactical, intelligence and operation were required to use individual communication network to relay information but with MCN-AE,the service covers all the individual network onto one tactical network[3]



Discussion

Network modernization is one of main of the main concerns being spearheaded by the army futures command.

To attain their goals, the army is conducting a series of two year capability test. Each set has a number of intention including unified network, common operating environment, joint interoperability/coalition accessible and common post mobility survivability according to the service. The army is done with the design review for the next round of network tools called capability set 23[3]

The technology being developed within the capability set 23 will be concentrate on medium weight Stryker brigades that will leverage multi layered architecture of communication networks. One of the top efforts for this is known as command, control, communication, computer, intelligence, surveillance and reconnaissance or known as the C5ISR.[3]

C5ISR is an acronym for Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance. It enable information dominance and decisive lethality for the networked Soldier. CMOSS is streamlining the integration of a number of capabilities into one platform [3]

As part of the effort, the Army is using the OpenVPX standard, a hardware form-factor computing system that attaches to the chassis of a Stryker vehicle and allows capabilities to be fielded in the form of processor cards.The CMOSS concept can be put into various types of systems[3]

Officials are working to ensure that the CMOSS concept stays relevant as technology continues to rapidly evolve, said Jason Dirner, an electronics engineer with Army Combat Capabilities Development Command's Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance Center(C5ISR)[3]

Conclusion

On the current battlefield, for long term communication usage soldiers in the army rely on a single geosynchronous connection or satellite .MCN-AE was the new technology which was developed in the conference of 2021. It is helping the soldiers communicate over secure network. The CMOSS system is to be stayed relevant throughout the years to develop new communication system through technology. {3}

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