



RoGO's WarCATS Connects DoD Personnel Operating in Austere Areas

RoGoCom.com

RoGO Communications white paper
Defense Applications
Rod Goossen, CEO of RoGO Communications
11/23/2021



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Abstract

Communications are essential to any successful military tactical operation to ensure mission success. This paper proposes how RoGO can quickly and inexpensively connect military ground troops together who are operating outside of MANET radio coverage, whether around the corner or around the world, all on the ATAK platform. Further, we can support remote sensing applications, support SOCOM ops, provide comms and tactical coordination between ground troops and airborne assets, and, provide a comprehensive communications and data transmission solution for the warfighter and Command & Control with world-wide data coverage capabilities.

Due to the cumulative monetary costs of potential miscommunications in military operations, the costs in American lives and the non-human asset destruction that misaligned and missed communications can cause, we present an operational communications solution in this paper. RoGO wants to address warfighter communications needs, including breaching information silos across U.S. and allied troops with an all-new encompassing communications approach. Currently, military operations use MANET or mesh network radios as their primary tactical communications means. Mesh networks function well so long as the mesh is not broken.

For times that:

- a) The mesh is broken, due to topographic or geographic constrictions, or long distances between different entities
- b) For coordination between air support and ground troops
- c) When unmanned remote sensing is needed
- d) When precision smart munitions guidance to target is needed in a GPS-denied area, we offer a singular solution
- e) Remote sensing is needed for chemical, radiological or biological threats so troops can know what they are getting into before they get there
- f) Accurate smart munitions guidance to target in GPS-denied areas is needed
- g) The ability to breach information silos across different military organizations, or across Allied forces

RoGO can help correct all of these situations.

This paper describes the system & technology behind RoGO Communications' unique satellite-enabled communications and data transmission solution, called the Warfighter's Communications, Asset and Tracking System, or the WarCATS. The WarCATS solution is a hybrid software/hardware solution, which fully integrates with the ATAK platform.

This white paper describes the WarCATS application specific to military operations, and how RoGO can help in areas a-g described above. We believe the WarCATS solution, as a result, will save the lives of more troops and enable more efficient and effective mission successes by operating in a more informed, timely and tactically-coordinated way by transmitting/receiving more data in a secure fashion than was previously possible when operating outside of MANET coverage.

Problem Statement

In today's warfighting conflicts, there is often a lack of accurate situational awareness and communications with which to make timely decisions from, on a platform which does not cause cognitive overload, when troops are operating outside of MANET mesh network radio coverage. Break the mesh, and troops are out of critical communications and information supply lines. There is also a huge amount of information created at the tactical edge. To make this information relevant, it needs to be sent to a place where the results can be quickly analyzed, interpreted, make informed decisions from, then sent back out to troops in the conflict to take action on.

There is also not a current way to inform troops of the presence of biological, radiological or chemical hazards ahead of putting troops in harm's way. Lastly, there is not a current device that enables smart munitions guidance to target in a GPS-denied area, or that enables the intake of wind speed/wind direction information from the target location for smart munitions trajectory corrections needed by accounting for wind characteristics near the ground to enable course corrections for accurate smart munitions strikes.

There is no current way to acquire current Situational Awareness data in remote areas, like up-to-the-minute wind speed, wind direction, the GPS position of other nearby friendly forces when outside of MANET range. There is not a way to efficiently recognize, *nor predict the movement of the cloud of* chemical, biological or radiological particulate to know who might be in harm's way.

To solve this problem, this paper outlines the technology solution that RoGO Fire has developed to solve these issues. RoGO has developed a patented integrated satellite communications system incorporating GPS-enabled & SATCOM-enabled portable devices called DropBlocks. DropBlocks track the GPS positions of human and non-human military assets, transmits weather & wind speed/direction information from remote areas, and enables warfighters to communicate with the Command & Control and specialized operational response teams in real time. Our devices also share up to the minute vital scene information, like the status & location of warfighters, weather changes, contaminant presence and direction (and predicted direction) of movement, resource GPS position, tactical maps, and changes in assignment.

For troops outside of MANET radio range, a way to communicate vital scene tactics and situational awareness information is essential. This creates better efficiency and effectiveness and informed decision making to ensure operational success. Our solution is further described *infra*.

Background

The development of the WarCATS solution came about after the recognition that a ubiquitous, secure way of transporting data to/from the tactical edge is needed, and that MANET radios do not work when obstructed by geographic obstacles or long distances. With a background in electrical engineering, Rod Goossen (who later co-founded RoGO Communications) teamed with other SATCOM communications industry experts, a strong



hardware and software engineering team and industry advisors to develop this satellite-based communication and information solution for all remote military personnel, remote workers like Wildland Firefighters, remote All-Hazards responders, and for anyone or any group that works or plays in remote areas void of cellular coverage.

We can save large fractions of time and money and effort by bringing this system to fruition in order to coordinate the tactical effort of many human and non-human resources in a remote military operation. The situational awareness (SA) component of this system alone will save lives and save money, but the WarCATS will do much more than that.

The WarCATS system will significantly cut down on clerical work like updating troop position and current status and informing of ammunition and supply status to remotely located troops. It will also save on unnecessary redundant operations due to uncoordinated communications, get emergency assistance to injured warfighters faster through instant communications and accurate victim med-e-vac location, and many, many more money-saving and time-saving benefits...through the application of this technology. It will get needed, essential scene information to the remotely-located warfighters who need this information.

Solution

The WarCATS solution is a two-part system: Part one will be SATCOM-enabled lightweight, portable DropBlocks, which will be carried by ground troops. These devices, which only weigh a few ounces, will provide the vital data communications link to/from Command & Control and any Soldier's ATAK-enabled smartphone. DropBlocks can also send data from remotely-located wind speed/wind direction sensors (like a Kestrel 5500), or chemical/biological/radiological sensors to inform our predictive analysis software to predict gas particulate movement and behaviors. We then send this predictive information back out to Warfighters, neatly overlaid on top of an ATAK software platform, so warfighters can see where they are, where the particulate danger is now, and where it is predicted to be in 20, 40 & 60 minutes, and who could be in possible danger.

DropBlocks will also mark & track the position of all other warfighting resources: DropBlocks marks & tracks the real-time positions of trucks, tanks, or, it can mark high-interest structures, bombing targets, med-e-vac rescue pick-up spots, makeshift water resources, or one of about 40 different things. All DropBlock positions will be shown on all troops' ATAK smartphone applications, and on all other warfighting leader's tablets or laptops, discussed below. Knowing the real-time location of surrounding resources will enable warfighters to quickly employ these specific capabilities when situations warrant.

Part two of the RoGO system is a high-bandwidth SATCOM connection: All Warfighter crews besides ground troops have leaders near to, or residing in a vehicle, where power and weight are not a constricting consideration like they are for ground troops who are operating on foot. For these leaders positioned in vehicles, RoGO can tie into any existing communications capabilities. We can facilitate collaborations or communications over ATAK or Team Connect for ubiquitous battlefield communications and collaborations between troops.

Many different ATAK platforms in an operational area can use our SATCOM data connection to provide up-to-date data on wind, weather, location of nearby resources, tactical instructions, and display RoGO's predictive analysis software overlay to give predicted future location/movement of any sensed dangerous particulate. It will also provide instant communications from Command & Control to/from any warfighting groups when these groups are out of MANET network coverage. The ATAK platform, with predictive particulate cloud movements, sensor inputs from remote locations and communication portions of the RoGO offering will empower military leaders to make informed decisions and direct troops accordingly. These decisions can now be made based on whatever particulate cloud or weather events are predicted to occur in the near-term future. Now, every military leader can see where everyone -and every non-human resource- is at in near real-time, have predictive analysis information to inform tactical decisions on, and be able to communicate with any one group, or a geo-fenced area of groups, in seconds. This will enable a better tactical coordination across the fight, as well as increase safety for all warfighters.

DropBlocks can be placed to mark the locations of high-value structures to protect, water resources, food & supply drops from aircraft, the location of an injured warfighter for immediate medevac pick-up and more. Additionally, DropBlocks will have the functionality of vector positioning. Vector positioning will allow a warfighter on the ground to place the DropBlock pointing along a certain vector...this vector can then be transmitted up to an aerial resource. Aerial resources will now have positive confirmation that all friendly forces are out of the way of a bombing run, aerial gunfire source and positive affirmation of the flight trajectory and position of the bombing target. With the marking of a specific position *and* vector along which to drop ordinance aerial bombers flying through heavy smoke, heavy clouds or other low-visibility conditions will no longer miss their target drop point. An accurate, targeted munitions drop will provide maximum effectiveness for each drop effort. This will save further time and money spent fighting the conflict.

Conclusion

We need a better way to dominate military conflicts, especially against new and emerging threats like China and Russia: we now need to fight conflicts with intelligence as an addition to brute force. Using the WarCATS technology to deliver information and communications -in real time- provides situational awareness, pertinent data, and information directly to warfighters of all ranks and will allow warfighters to fight the conflict more efficiently, effectively, and more safely. The free flow of communications and situational awareness information to warfighter will also save warfighter and civilian lives and save significant taxpayer money spent fighting conflicts by using the superior technological advantage that the WarCATS system provides.

After the explanation above, it would take only a little imagination to envision how this system can be applied to other military-supported disaster response scenes, making their responses more efficient and productive. After a hurricane takes out local telephone communications or high flood waters destroy cellular or terrestrial-based communications apparatus, troops need a way to best align their tactical efforts in conjunction with local authorities. Without the communications and sensing tools discussed in this paper, this would



leave military troops at a disadvantage to help citizens in peril, and to help themselves survive in extreme conditions, which are often met during the extra-ordinary events that occur during a military conflict, or during an All-Hazards emergency.

In all these instances, the *timely transmissions of communication and information is key*. Communication, coordination, information, and collaboration are essential aspects to responding to both wars and man-made & natural disasters effectively and saving lives and money *and* unnecessary collateral damage. When ground-based communications methods are down, or simply not available, there is only one place to go: upward with SATCOM communications. Let's use our available technology to fight military conflicts with intelligence, and also use this fabulous tool to fight any all-hazards event more efficiently and effectively and save more lives...let's fight all of these events...with intelligence.