

## GILAT BLOG

### From Pigeons to Satellites: Military Communications for the 21st Century

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#### A brief history...

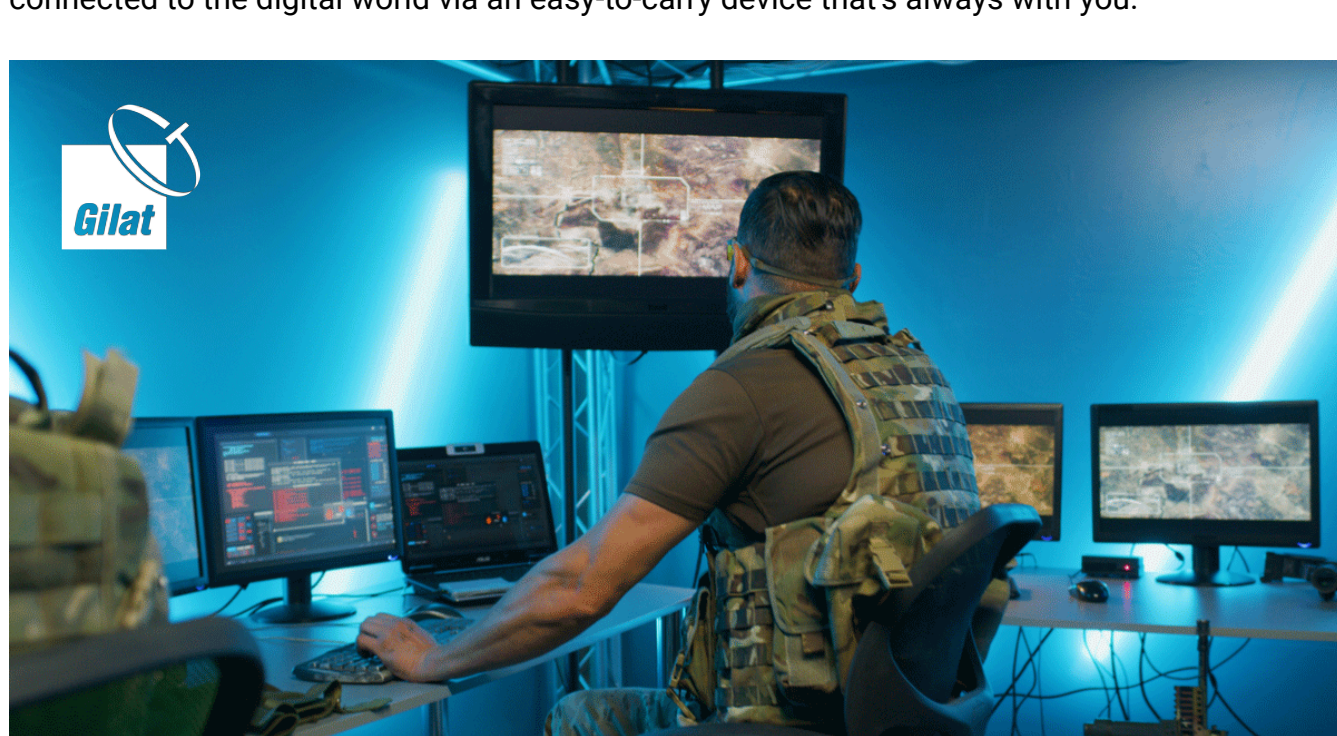
The earliest known forms of military communications relied on pure strength, or the physical power of humans, pigeons and horses. From there, ancient militaries evolved to operating within line-of-site distances, using smoke and fire signals, flashing mirrors, signal flares and flags to pass and exchange information.

The optical telegraph, invented in 1793, allowed modern militaries to move away from physically transmitting information. However, it was rendered obsolete by the invention of the electrical telegraph, and Morse Code, in 1838. For the first time in history, military information could be transmitted beyond visible distances without any significant delay.

At the onset of World War I, radio technology was very new and had limited capabilities. But by the time the United States entered World War II in late 1941, radio technology had vastly improved. Lightweight, portable, battery-operated transistor radios were now being used in the field. In addition to hand-held use by US warfighters on the ground, radios were now an integral part of airplane, submarine, and tank communications. Transmissions went greater distances and were more reliable, and soon became a critical component of battlefield success.

#### Impact of Technology on Human Interaction

Technology shapes the way people and societies behave, as individuals and with others. While technology has developed for as long as humans have been around, the last 100 years has seen the biggest evolution of technology which has had the biggest impact on how people see the world and interact with others. Specifically, the Internet and mobile devices have radically altered the way people obtain and share information with others, since one of the major impacts of technology is the optimization of communication systems. Mobile devices brought groundbreaking change to human interaction due to the innate nature of always being connected to the digital world via an easy-to-carry device that's always with you.



#### Digital Transformation

Since World War II, a large portion of defense industry spending have been driven by technology. Throughout the second half of the 20th century, technology-based defense grew more prevalent and became the best approach to solve security challenges – at least for the larger, more developed military spenders.

The quest for technological superiority and innovation makes sense when armed forces are trying to preserve and reinforce their strategic advantage. The Digital Transformation of the military continues to shape the future of global security. Seamless collaboration and communication are crucial to helping defense agencies realize a more modern way of working and managing themselves more effectively; sharing vast amounts of critical information (including voice, data and video) in real time makes military maneuvers more efficient, effective and resilient while significantly reducing the chances of loss of life.

#### Today's Modern Battlefield

Fast forward to the 21st century; militaries no longer look like they did in the past. Today's modern militaries move faster, more efficiently and with greater precision than ever before, based on information systems which consume high bandwidth.

How is this possible?

Modern militaries have embraced the concept of "net-centricity." The theory around net-centricity is fairly simple: by implementing a globally interconnected broadband communication network (including infrastructure, systems, processes, and people) that speeds up 2-way communications and increases situational awareness, the efficiency and effectiveness of military operations will improve.

Vast amounts of data are shared in a timely, seamless and resilient way among warfighters, officers, applications and platforms during all phases of warfighting efforts. This in turn allows combat units to be smaller in size and allows them to take on a different range of missions than non-networked units. Net-centricity enables the real-time, free flow of information across the battlespace so that data is shared, processed into information and then provided to the people or systems in need.

Communications networks are based on Big Data and include WIFI, cellular, voice, video and others. In order to achieve this level of connectivity and operational continuity, where ever forces may be and in spite of any enemy efforts to block communication, modern militaries are now using satellite communications (SATCOM) to help ensure the successful completion of land, sea and air missions.

#### Practical Uses of SATCOM in Today's Battlefield

The net-centric battlefield has increased the importance of quick-deploy SATCOM-on-the pause and on-the-move. Governments and militaries, already attuned to the advantages of fixed and mobile satellite services, recognize the critical need to access these services where and when needed, however challenging the conditions may be.

Gilat's full scale, state of the art SATCOM solutions are fully equipped for today's digital battlefield. Offering antennas, modems, BUCS, manpacks and unmanned platforms, Gilat enables the constant flow of 2-way secured information for intelligence, live video, voice and Command & Control information for any SOTM use case and any platform.

Following are a few examples of how Gilat's SATCOM technology is used in military settings across the globe:

In order to secure the release of hostages, a team of Navy Seals approached a foreign shore. The team arrived safely to the beach but had no 'eyes' on what was happening beyond the sand. Out of fear of being spotted by coastal sensors, HQ deployed Gilat's Blackray, an unmanned aircraft (UAV), to survey the landscape and send back video to be analyzed by the command-and-control center. Tactical unmanned aircraft systems (UAS) are often capable of long endurance times while carrying significant payload weight. Satellite communications fully exploit tactical UAS capabilities, supporting intelligence, surveillance and reconnaissance missions beyond line of sight. Based on the information provided by the UAV, artillery units were safely moved closer to the border and a Navy offshore patrol vessel hugged the coast. In a completely coordinated mission and based on common situational awareness, the hostages were rescued.

The mission was successful in large part because all of the forces involved had a common picture of what was happening and could choreograph their actions as the situation unfolded.

In another mission, ground troops were activated to enter a city in order to remove enemy forces planning a terrorist attack. Historically, warfighters in this situation go in 'blind,' meaning they had no situational awareness as to what was happening behind the closed doors of houses, offices, warehouses, etc. Warfighters would have no choice but to go door to door, hoping to avoid injury to the innocent and capturing the fugitives without incident. However, with the use of SOTM (Satellite on the Move) technology, warfighters can enter battlefields with their eyes wide open. In this scenario, data and video were collected via a number of different applications and sent back to HQ and to the forces in real time via Gilat's ruggedized Ka- and KU Band SOTM antennas. The information was reviewed and analyzed by intelligence who in turn were able to advise warfighters on the ground exactly which properties to approach and which to avoid.

Another critical use of satellite communications involves paratroopers using Manpacks. Paratroopers are trained to conduct a range of missions, from prevention and pre-emption tasks, to complex, high intensity war fighting. They are often the first on the ground during an incursion and are responsible for a tremendous amount of intelligence gathering. Using Gilat's fully integrated and lightweight SatTrooper manpacks, which provide rapid connectivity to voice, data and telephony even under the harshest conditions, paratroopers are able to share invaluable information to command and control. The small-size dish antenna can be set up with minutes, with automatic pointing, and does not require any special tools for assembly. This technology was recently used in a country facing unprecedented civil unrest to thwart a coup attempt.

#### Defense is Where we Come From

For over 30 years, Gilat has been a pioneer and leading innovator in satellite communications. Gilat leverages our commercial technological leadership and innovation, providing SATCOM solutions to governments around the world to answer all of the broadband communication needs required by today's modern battlefield.

Gilat offers rugged, quick-to-deploy and field-proven SOTM solutions. Our comprehensive and flexible solutions consist of fully integrated VSAT systems that ensure seamless connectivity for both on-the-move and on-the-pause missions. These high-performance VSATs support voice and data communications, military C4I and border patrol activities with full interoperability among land, sea and airborne forces.

Further to the comprehensive global expertise and experience in delivering SATCOM solutions for the defense market, Gilat is uniquely positioned to serve this market, due to its DNA. Many members of Gilat's executive team, discipline experts and R&D engineers have extensive military experience across a wide range of disciplines and expertise, thus enhancing Gilat's understanding of the needs of today's defense forces and how best to support them using the latest SATCOM technology.

#### To learn more about Gilat's Solutions for Defense, please contact us at:

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