



Establish Secure, Reliable Forward Operating Base Communications in Less Than an Hour | May 24, 2006

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Executive Summary

For military training or combat operations in the field—as well as emergency or first-responder situations at home—one of the first orders of business is to establish communications. Field communications systems must be reliable, secure, quick to deploy in less-than-ideal situations, and able to address a wide range of communications needs, including voice and data. A typical Army scenario that illustrates these issues using the installation of a PacStar 5500 is described here, along with a complete checklist for requirements for temporary base communications systems covering hardware, software, and deployment requirements.

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Introduction

For military training or combat operations in the field—as well as emergency or first-responder situations at home—one of the first orders of business is to establish communications. Field communications systems must be reliable, secure, and able to address a wide range of communications needs, including voice and data. Perhaps most importantly, they must be deployable quickly and in less-than-ideal situations. A typical Army scenario illustrates these issues.

Day 1

A compact advanced echelon (ADVON) team is assigned for reconnaissance and to set up a forward operating base. The team, a combination of operations, logistics, and security personnel, is deployed with little advance notice. With no communications personnel available, an operations sergeant is tapped for the job and given a quick, 30-minute overview on setting up communications and networking capabilities in the field. Even though he has no experience in this area, he is responsible for establishing secure and standard telephone service, data and Internet access, wireless communications, and email for the entire ADVON base—within an hour of setting up the command post.

[0700] ADVON team arrives on site.

The team finds inhospitable conditions: roads are bad or nonexistent; there's no power, no water, no cell phone reception; the weather is hot and humid and dust is everywhere. The possibility of enemy hostilities puts the team on edge and makes establishing immediate communications capabilities even more important. The operations sergeant, who will act as the field operator for this exercise, is in a truck with critical communications gear at the front of the convoy.

[0800] The tent or temporary shelter that will serve as the forward base command center is pitched. Security personnel assess the area and begin to establish a defensive perimeter.

During this time, security team personnel depend on tactical radios for communications but they will return to the command center soon. When they do, they'll need full communications capabilities to access current intelligence from other units and report back to the main body.

[0830] Two ruggedized equipment cases, each less than 6 cubic feet in size and weighing 150 pounds or less, are pulled from the communications truck and moved into the command center.

The equipment in the cases, the PacStar™ 5500 deployable network communications center, (reference figure – to be supplied) provides a WAN port (RJ-45) with 55 Mbps throughput, gigabit copper and fiber Ethernet connections, and a JITC-tested and DISA-approved PBX, with features such as MLPP, voicemail, unified messaging, call holding, call forwarding, multi-party, and caller ID. As an option, it offers secure, encrypted wireless communications support with a coverage area up to .5 miles.

[0845] The operations sergeant connects the 5500 to the generator and turns it on.

[0853] Eight minutes later, the operations sergeant boots up the 5500 for the first time, logs in, runs the setup wizards, and establishes initial system functionality.

[0854] A standard telephone is plugged in and produces a dial tone. Less than an hour from setting up the command post, the ADVON team makes its first phone call to headquarters, reporting operational status.



As operations and logistics teams continue to set up the forward base, they begin the switch from tactical radio to telephone service that supports full duplex conversation. The temporary communications post will serve up to a hundred access points, including standard telephones and secure handsets. Internet service, for email and access to web-based military applications such as Blue Force Tracking (BFT) must be established as quickly as possible to compile intelligence from multiple sources. If needed, wireless networking capabilities can support laptops and wireless phones in the field.

[0930] The operations sergeant acting as field operator begins to enter user identifiers into the system.

The system's configuration software is wizard-driven, so even though the operations sergeant has limited training, he can quickly and easily enter individuals' access rights, manage dozens of communications scripts, and network multiple systems, with few opportunities for error.

[0931] The ADVON team runs phone and LAN cabling within the temporary command center

and connects computers and additional standard or IP telephone handsets.

Fully functioning voice, data, and video capabilities are now available throughout the forward command post. The team is able to check and report status, notify the main body of issues, research and report resupply needs, and communicate directly with local and long distance telephone switching stations.

In this scenario, the advance group is surveying the location for a fixed base to be established. Ultimately the temporary communications facilities will be replaced by more permanent equipment, such as a Joint Network Node (JNN). The JNN will need to be convoyed or airlifted in

once the area is secure, and will bring with it a team of specialized network and communications personnel. But for now, the advance team has all the communications capabilities they need—just 46 minutes from power-up.

[1430] The operations sergeant leaves the command post to help set up computers and phones across the temporary base. He remotely logs into the system with his laptop and enters new users without needing to return to the command post each time.

[1800] Back at the command post at the end of the day, the operations sergeant prepares for the shift change. He uses a USB thumb drive to quickly back up the system, and leaves the command post in the care of the night-shift soldier who will also man the base message center.

The night-shift soldier's instructions are simple: if a bright red bar shows up on the monitor, he should follow the simple instructions on the screen to correct the problem. Alert messages are also automatically emailed to his station to be logged.

Day 2

[0800] The temporary base network is expanded to support the arrival of additional personnel who need voice, data, and video services.

[0830] Technicians complete LAN and phone cable extensions to the new personnel.

[0835] The field operator creates user accounts, assigns them to a printer, places them into a work group, and assigns phone extensions to new users across the base.

[0840] New users connect handsets and computers, log on, and begin operations.

[0900] The ambient temperature in the command post is already close to 100 degrees Fahrenheit. The 5500's high-velocity cooling system switches on automatically, evacuating hot air from inside the case. With the amount of dust in the air, the operations sergeant takes a minute to clean the filters and then gets back to work.

By start-of-business on the second day, the PacStar 5500 is providing communications support for nearly 100 users. Full PBX support includes VoIP, analog, PSTN interoperability, with LAN,

WAN, Internet and WLAN support, file sharing and print services. For soldiers in the field, their communications infrastructure is as reliable and simple to use as if they were back home. In past mobilizations, this ADVON team's early communications network consisted of mobile radios until a JNN could be brought in by convoy or helicopter. Tactical radio was fast, reliable, and easy to deploy, but it also suffered from limited functionality and range, and provided no reach-back capabilities or Internet access to global intelligence resources. Communications bases such as JNNs often weren't available, took time to set up, required dedicated communications staff to operate and support, and could be unwieldy or insecure in hostile areas. The team had tried deploying rack-mountable modular systems, but with constantly changing team assignments, they couldn't always count on the availability of trained IT personnel to run and maintain it. In several instances, the team had reliability problems with these systems from shock, vibration, dirt, and inefficient cooling in high-temperature environments. The PacStar 5500, designed, tested, and certified specifically for these conditions, incurs no such problems.

Day 3

The 5500 continues to serve the forward base communication needs as the ADVON mission progresses and the team prepares for the main body to arrive.

[0900] Main body equipment arrives at remote site.

As permanent communications equipment is unloaded and staged, the 5500 continues to provide full voice and data communications support for the base. The new equipment can't be used until specialized communications personnel arrive. If necessary, additional 5500s could be quickly set up to support large blocks of additional users until the communications team arrives.

Day 4

[1300] Main body personnel arrive and begin to locate and account for all shipped equipment.

[1600] Organic signal personnel begin to set up and test the permanent communications equipment, including generators, grounding rods, and satellite dishes.

The 5500 supports all local and long-distance communications needs during this time.

Day 5

[0900] Signal personnel begin to run cable. The command post is expanded and additional computer systems are installed.

[1300] Organic signal systems are operational and signal personnel begin the transition to Army signal equipment.

[1305] The ADVON team's operations sergeant stands down the 5500.

Once computers and handsets are disconnected, the 5500's software-based PBX makes the process as simple and quick as shutting down a standard computer.

[1310] Five minutes later, the operations sergeant turns off the power to the 5500 and his team loads the equipment into its cases, ready to start the process over at a moment's notice at a new temporary base.

The PacStar 5500 will be moved forward again as the operation continues to expand, providing WAN connections and voice services to the next forward base. This reliable, easy-to-deploy communications system has helped ensure a safe, successful mission, and will continue to do so for training and combat operations in the field, or first-responder situations at home.

Temporary communications systems checklist

Providing the required connectivity is only part of what is needed by a temporary communications system. A complete checklist covers hardware, software, and deployment requirements.

- Compact, lightweight, and easy to set up by minimally trained personnel.
- Housed in a rugged, transportable case.
- Structural reinforcement keeps networking and computing components firmly mounted in the case and all electrical connections secured.
- Certified system meets MIL-STD 810F requirements for shock and vibration.
- High-velocity air-flow ensures that the system works to 140 degrees F ambient temperatures, with filtration of the airflow to eliminate particulates in the air.
- Full PBX support includes VoIP, analog, PSTN interoperability, with LAN, WAN, Internet and WLAN support, file sharing, and print services.
- Software wizards require minimal training to master.
- Software protects untrained users from complexities of system-level commands through well designed user interface.
- System meets or exceeds security requirements, with included antivirus and anti-spyware software, and all components security-tested and hardened (inside and out) through Newt analysis, MBSA, Leak Test, NMAP, and NSA/DISA STIGs.
- Approved for use on military networks, implementing an Army IA-approved and FIPS 140-2-certified ICSA firewall, with network attack detection and DoS/DDoS-protection support.
- Security options for emergency evacuation include removable hard drive and USB thumb drive configuration back-up and restore.