Air assault communications: Desert Storm

Soldiers and equipment, over time in the desert, developed an almost synergistic relationship. They worked together as one system.

by MAJ Dennis P. Salerno and CPT Thomas F. Washer

Any Signal student quickly learns that the two most important axioms of combat communications are rapidity and reliability. Warfighters want to talk now, and they want the system to work. Combine these axioms with the AirLand Battle imperative—move fast, strike hard, and finish rapidly—inherent in an air assault division, and the need for rapid reliable communications increases exponentially: rapid to keep pace with advancing forces, reliable to ensure their success.

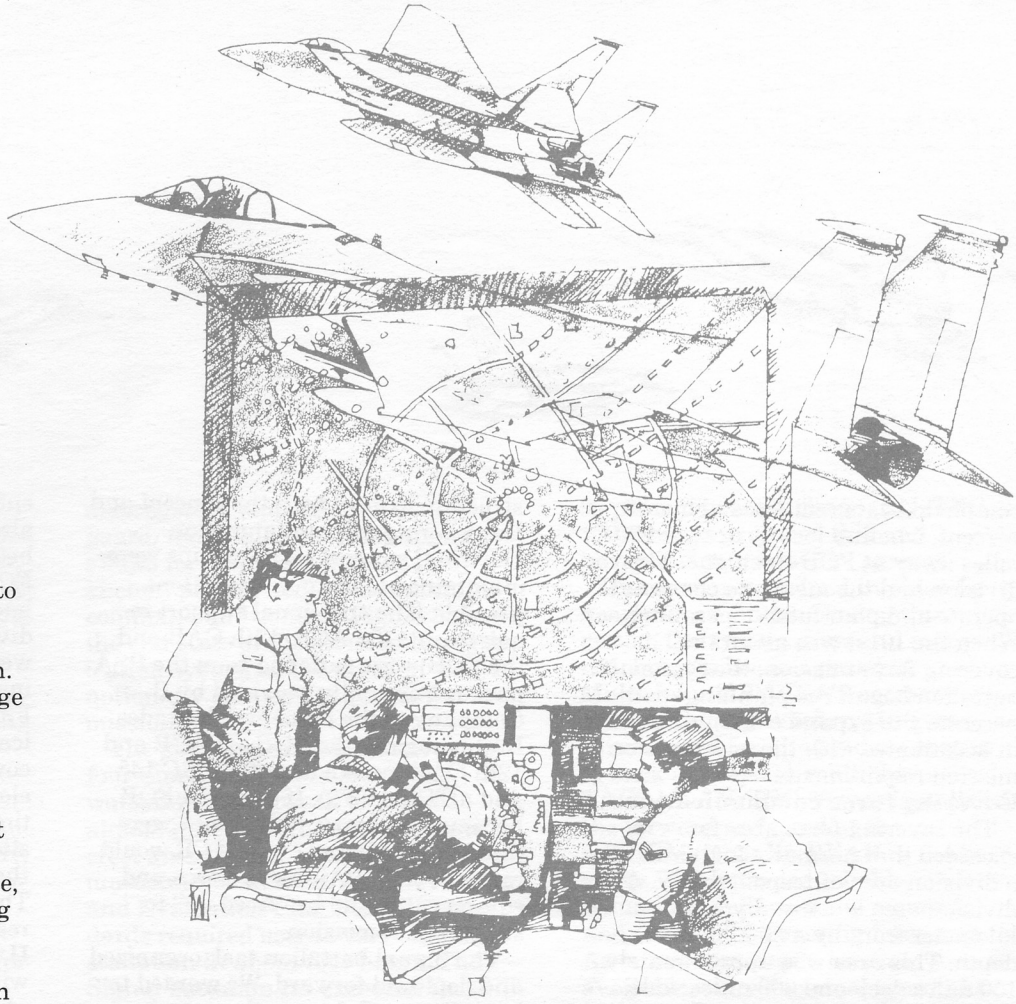
When the 101st Airborne Division (Air Assault) answered our nation's call-to-arms in August of 1990, its Signal battalion faced the challenge to provide essential command and control communications necessary for mission accomplishment. This article addresses how the 501st Signal Battalion met that challenge throughout Operations Desert Shield and Desert Storm. It describes how the command and control communications system began as austere base camp communications, quickly evolved to support a Covering Force mission, postured for war, and transitioned to form an unprecedented division offensive communications system which spanned over 1000 miles, and effectively supported air assault ground and air combat offense operations into Iraq.

Base camp communications

The initial communications were quite austere. As all services vied for precious air space or sea-lift priority, communications equipment began to take a back seat to combat arms requirements. Understandably, the effort was to project combat power to the region as quickly as possible. The 101st Airborne Division (Air Assault) deployed an aviation heavy task force augmented by command and control elements from the Assault Command Post (ACP) and support elements from Division Support Command (DISCOM) that formed a Forward Operating Base (FOB). As these elements began deploying in mid-August, communications staff officers hit the ground with other staff planners to begin receiving the division in and around King Fhad International Airport. Again, initial communications were quite austere.

The communications system began with a single long-local telephone extended from a corps (XVIII Airborne) switch to the Division ACP G3/G2 (operation and plans/intelligence). An extension telephone then extended this corps system access to the G1/G4 (administration/logistics). The division also entered the corps single channel TACSAT net. These "make do" communications afforded the division minimum essential connectivity necessary to affect operations, intelligence, administrative and logistics traffic. We could now receive missions from higher, order, purchase and receive supplies and material to build the base camp, and coordinate the arrival of organic equipment and personnel. The Signal soldiers anxiously awaited their equipment—equipment they would need to expand the system, and provide effective command and control communications.

Communications equipment arrived in mixed cargos during late August. As quickly as it became available, it was installed. Almost overnight the long locals became four trunks to corps as the ACP switch, a dismounted SB-3614A, was installed at what would eventually become the Division Tactical Operations Center (DTOC/DMAIN). As the line-of-sight equipment (AN/TRC-145s) began arriving, switching access was extended to the Aviation Brigade HQs located about five miles away from the DTOC. Almost concurrently, the Aviation Support Platoon from C Company arrived with their



equipment, and trunking was established between the DTOC and the Aviation brigade TOC. Simultaneously, the division began to lean forward—northward toward Kuwait—and established a FOB approximately 120 miles to the north. Since this distance exceeded the range of any on-hand, organic equipment, 35th Signal Brigade (XVIII Abn Corps) provided the 501st Signal Battalion with two tropospheric scatter (Tropo) teams and equipment (AN/TRC-170s). These assemblages linked the DTOC with FOB Bastogne, the Division's first forward operating base. Trunking was established utilizing an AN/TCC-41(V2) switch.

The communications system began to grow. Figure 1 portrays the system as it looked during mid-September. As indicated, the DMAIN/DTOC switchboard essentially became a switching node with links to higher (Corps), Aviation Brigade, a Forward Operating Base (FOB) where elements of the ACP and DISCOM collocated. Additional local user links were established with subordinate unit CPs in and around the base camp (King Fhad International Airport), which became known as Camp Eagle II. As units arrived, they were given a telephone (TA-838) and sufficient wire to connect their local command posts into the switching network.

The system described above provided the 101st Airborne Division (Air Assault) with a communications infrastructure that afforded it effective, reliable command and control (C2) over all of its major unit commands. The system was both overtaxed and overused. The AN/TCC-41(V2) remained over 90 percent committed (technical specifications recommend substantially less). However, system reliability rates were virtually in excess of 99 percent. People used the communications system—the system worked. The first time attempted/call

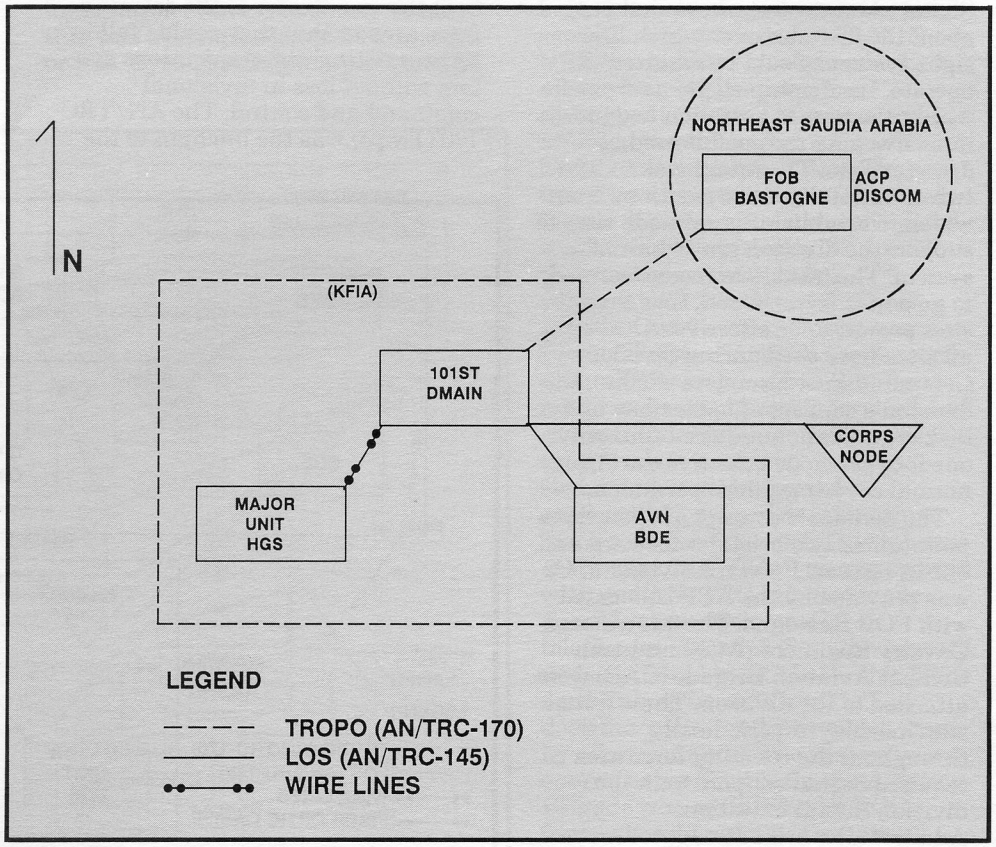
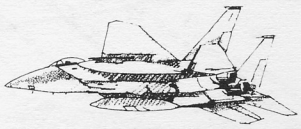
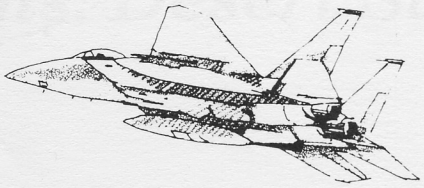


Figure 1.





completion rate remained above 85 percent, whether locally or over 100 miles away at FOB Bastogne. The division had the means to coordinate, operate and plan future operations. When the 101st was given the covering force mission, the Signal battalion began the planning necessary to expand communications in accordance with the new division mission requirements.

Covering force communications

The covering force area far exceeded that normally found within a division area of responsibility. A division area is normally a 50 kilometer front by a 60 kilometer depth. This area was approximately 150 miles deep and 300 miles wide. Signal planners became apprehensive about the distance over which line-of-sight systems would be required to operate. Leadership elements from within the Signal battalion began intensive map recons followed by desert recons. The intent was to find two or optimally three positions from which to establish Signal node sites to support the division multichannel system. The test shots recons seemed to go on for days-on-end; four Signal sites proved to be effective. Although all sites were used during division Command Post Exercises (CPXs), the division's concept of operations and task organization required that only one forward node be active during normal covering force operations.

The division's concept of operations maintained two brigades forward and one in reserve. Forward divisional C2 was provided by the ACP collocated with FOB Bastogne. The 3d Armored Cavalry Regiment (ACR) and 12th Combat Aviation Brigade (CAB) were attached to the division. These units which deployed periodically throughout the covering force area required Signal support from the division Signal battalion. Additionally, brigade support areas (BSAs) were replaced by FOBs. The 501st tailored the communications structure to meet both the concept and the covering force organization. Doctrinal support relationships were maintained to the greatest extent possible. The additional support requirements (3d ACR/12th CAB and the FOB) were satisfied from the BSA package normally provided by B Company to the maneuver brigades. In this regard, the FOB, 3d ACR and 12th CAB received an AN/TRC-145 and a TCC-41(V2). If a second FOB became necessary, indications were that 12th CAB and/or 3d ACR would revert to XVIII Airborne Corps and equipment would be "freed-up" to support that mission.

The Signal battalion task organized and deployed forward. We wanted to beat the war-fighter to the covering force area so that they could "fall in" on an existing communications system without loss in divisional command and control. The AN/TRC-170 (Tropo) was the linchpin to the entire system. Since a link had already been established via tropo between Camp Eagle II (DMAIN) and FOB Bastogne, this became the backbone system to forward divisional elements. Forward MUCs were tied into the Signal node which, in turn, was linked to the division. Figure 2 depicts the division communication system supporting the covering force mission. Note that all elements are not forward at any given time. As units deployed, their Signal slice would deploy with them, tying them into the forward Signal node. The Signal battalion HQs and a reserve node remained at Camp Eagle II. Forward nodes were rotated along with a brigade rotation which took place about every 25-30 days. This normally coincided with deplacement forward of the division main to exercise covering force operations/war plans.

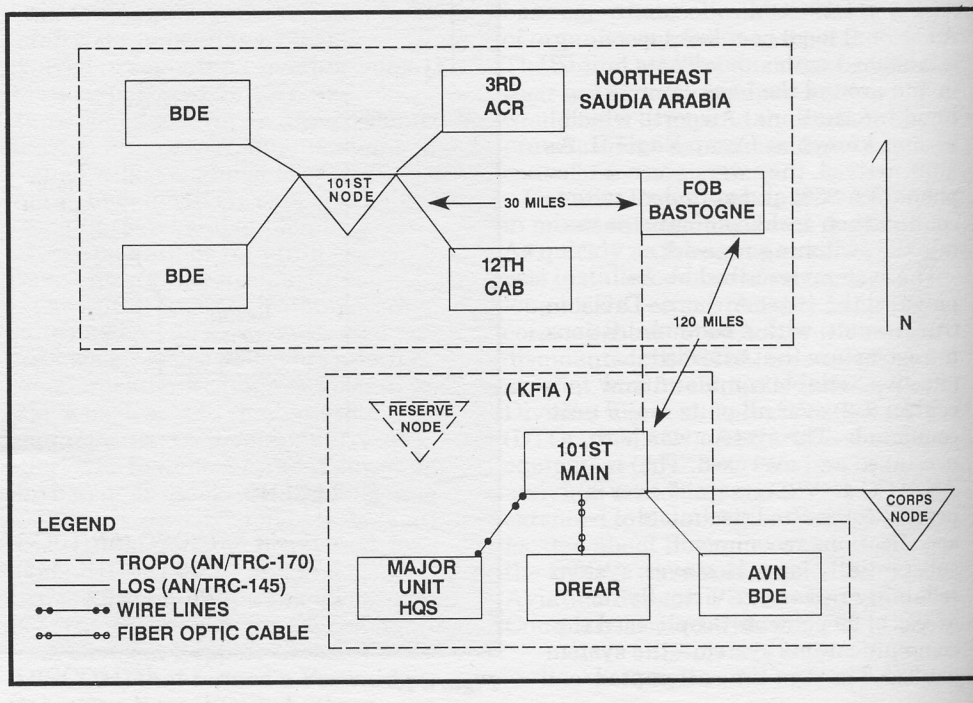
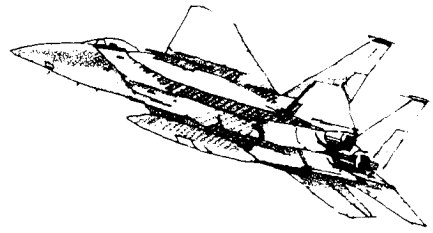


Figure 2.



Upon the break out of hostilities, the division plan was to move forward and fight the covering force battle holding the line-in-the-sand until they become near combat ineffective (about 30 percent attrited), and then retrograde and assume a guard mission on the western flank of heavy forces in the Main Battle Area (MBA). Signal support complemented this plan. Upon alert notification, the reserve Signal node and the Signal battalion TOC would move forward, with or preferably before the DMAIN, and establish a backbone communication system with the forward node and begin dual-homing major unit commands. This would then allow for eventual retrograde operations as required. The forward node would then be free to conduct retrograde operations and reestablish a dual node system supporting the guard/flank mission. Dual-homing allows for using one node as an anchor/pivotal node that maintains command and control. Figure 3 shows the end state of the division communication system as the division would notionally perform its guard/flank mission.

The plan was executed thoroughly four times, and communications worked like clockwork. It seemed almost too easy. Units would move, erect an antenna, and lock into the multichannel system. Army Training and Evaluation Plan (ARTEP) standards required user-to-user circuit installation in about four hours. The Signal battalion far exceeded these installation standards. Many times this was accomplished in 60 minutes or less. System reliability remained at 99 percent overall. Tropo (AN/TRC-170) always exceeded this and hovered virtually at 100 percent.

The system remained in place for nearly five months. During this period, the system grew and many refinements became possible. Multichannel TACSAT access was granted during October, 1990, and this allowed for a redundant system to back up tropo. A multichannel TACSAT AN/TSC-85 was installed at the forward node and at the DISCOM/Division REAR in the base camp. This afforded reliable, redundant links as units moved in and around the covering force area. As more corps assets became available, more doctrinal type links to higher units were provided. Corps systems were installed at DMAIN, DREAR and the forward node. This allowed for alternate routing throughout the area of operations and afforded the subscriber a significantly higher call completion rate. The system became better and more refined. Signal doctrine, although considered, was basically overlooked to provide the war-fighter with better communications. Out of this grew a split TOC or Tactical Operations Center/Tactical Assault Center communications support concept. As major units would rotate forward and rearward for training or exercises, they found it necessary to leave elements forward to guard ammunition, retrain or maintain a quick reaction presence. This element or forward TOC (TAC) was supported with one AN/TRC-145 that made possible three each long-local telephones extended from the forward node switch (AN/TCC-41). This standard link-up became local doctrine/policy and was widely used by all major units. The system was enormously effective for the Aviation Brigade who maintained a TOC forward and Logistics Operations Center for Aviation Maintenance in the Rear. As Signal equipment rotated

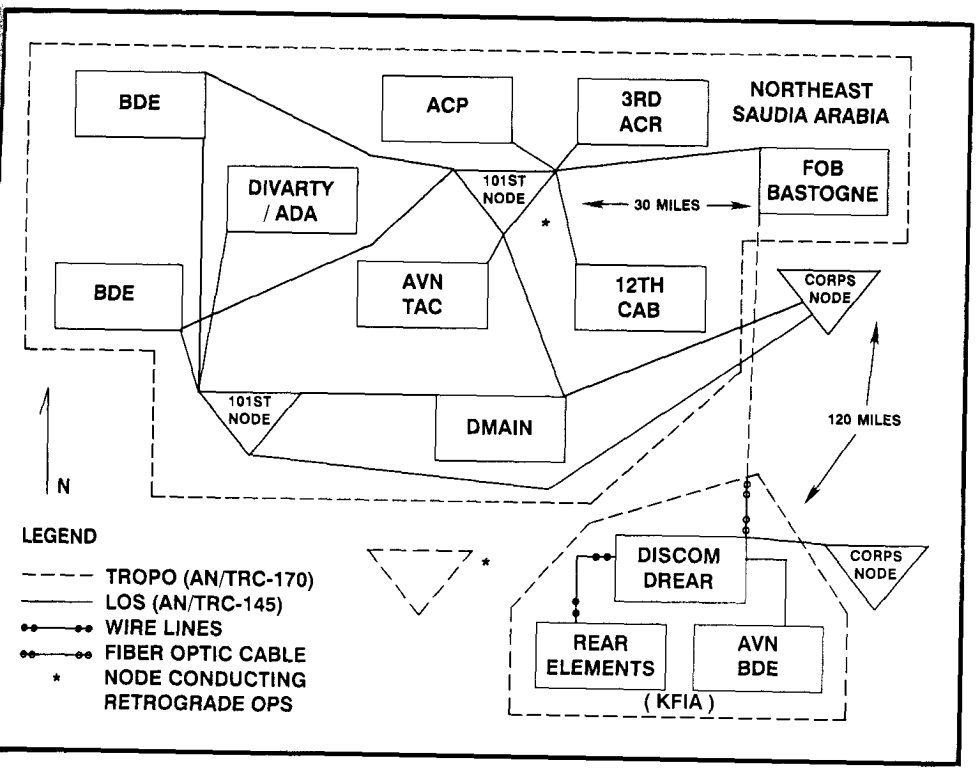
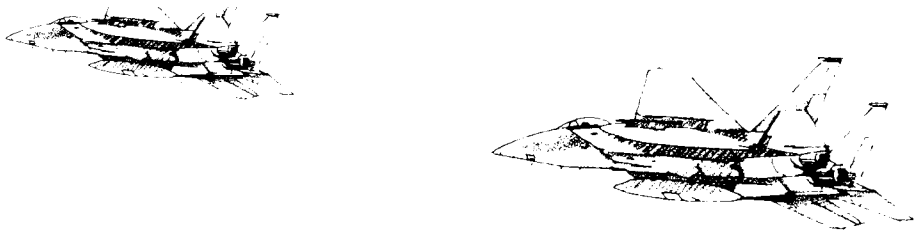


Figure 3.



with the units, down time was never really down time. The time spent in Camp Eagle II centered on vigorous maintenance activities. Figure 4 shows a typical system supporting the division. The system stretched battalion assets to their maximum. This overcommitment required intense centralized system management and direction. Subscribers became comfortable with the system, and actually knew and understood what type of command and control links would be available should war break out. The communications war plan was formidable—solid and proven effective over time in the desert. The plan, however, was soon to change.

Posturing for war

Toward the end of December, 1990, planning began to move the entire division westward to a Tactical Assembly Area (TAA) where we would posture for war if required. The move would cover over 800 miles, about the distance from Nashville, Tennessee to New York City. On D-Day, with the commencement of the Air Campaign, the order was given to move. Communications support elements began an orderly withdrawal from the covering force area and consolidated with other division units for the long move northwest. Communications support for the movement—per se—was pretty standard. Communications support pulled the division command and control forward through a series of "leap frog" actions using multichannel TACSAT at the MAIN, TAC (ACP) and REAR. Additionally, single channel TACSAT was heavily used by key division elements and movement control centers during the move itself. The move was easy. Communications upon arrival was more of a concern.

The TAA was basically uncharted territory. Although map recons were extensive, test slots and ground recons were never conducted. The terrain, at least on the map, appeared to be the same as the covering force area. The S3 (operations and plans) system managers developed a plan that would allow for rapid installation of a division system as units "hit the ground" in the TAA.

Platoon leaders were given all available information prior to departure for the TAA. Multichannel frequencies were deconflicted for the area and distributed; program worksheets were developed as were trunking diagrams. Subscriber listings were developed IAW those used in the CFA. Since locations for MUC CPs, as well as DMAIN, DREAR, the Signal node, and so on were not known, the plan dictated that platoon leaders, upon arriving in a location, enter the battalion FM command net and request an azimuth for installation of the multichannel/line-of-sight systems. To minimize the time required for installation, the Signal node turned on receivers, and all that remained was antenna orientation. The plan was executed flawlessly. Within minutes after arrival on site, the multichannel system took life. Circuits were installed virtually faster than the S3 staff could log them in. Inherent in the success of this rapid installation was the training accomplished throughout the covering force operations and standardization of program worksheets for like units. The AN/TCC-41 required little or no additional programming or reprogramming. The old system, with minor changes, was basically reestablished in the TAA. Figure 5 depicts the division multichannel system as the division postured for war during the Jan-Feb 91 time frame.

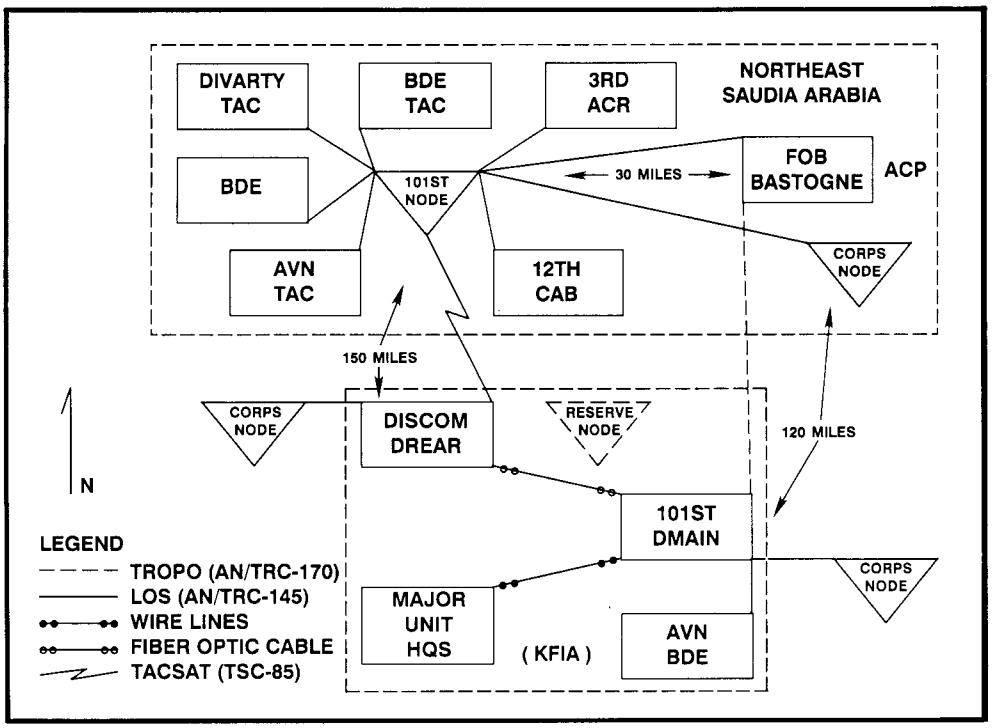


Figure 4.

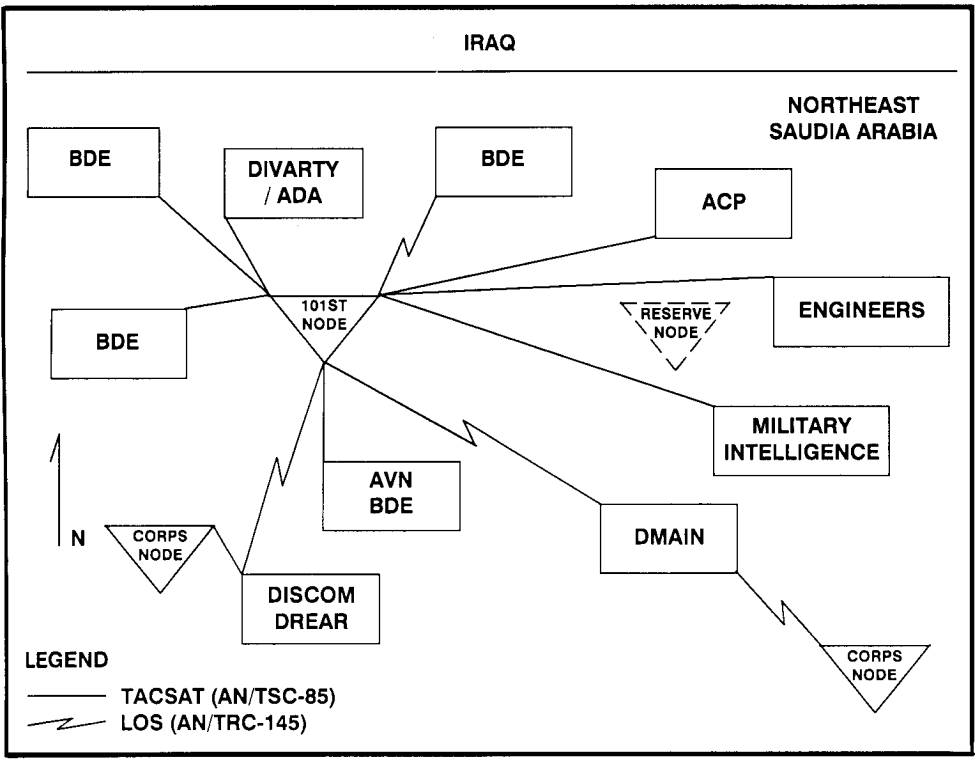


Figure 5.

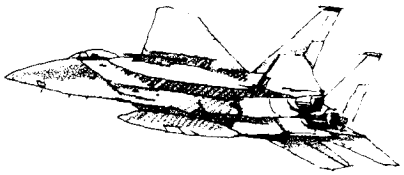
The systems long-haul capability while in the TAA was multichannel TACSAT. As seen in figure 5, an AN/TSC-85 at MAIN provided a link to corps and another link to the Signal node. An AN/TSC-93 also linked DREAR to the node. The systems held at about 98 percent reliability during the TAA operations. It should be noted that the AN/TSC-85/93 assemblages were B model terminals provided by the 3d Signal Brigade from Ft. Hood, Texas. The 501st Signal Battalion's equipment was sent to the continental U.S. for a baseband improvement modification (BIM) under the product improvement program (PIP), converting the system to digital communications. Signal battalion personnel, who received only 10 hours of instruction on the new equipment prior to D-Day, received hands-on training from 3d Signal Brigade soldiers that augmented our satellite teams. Both the new system and newly trained soldiers performed admirably and successfully passed product testing and evaluation under battlefield conditions.

This network configuration afforded a reserve Signal node that prepared equipment for operations into Iraq. A tropo team was also attached to this node. When future ground operations began into Iraq, tropo, along with multichannel TACSAT, would provide the backbone systems for the division's transition to cross border operations and the ground war.

Offensive communications

While in the TAA, the Signal battalion staff developed a communications plan to support the 101st Airborne Division (Air Assault) offensive operations deep into Iraq. The division's mission was to conduct air and ground interdiction in the Tigris-Eupharates River Valley, destroying escaping Republican Guard forces and then move east, consolidate on an objective (objective GOLD) in the Basara area, and be prepared to conduct future oeprations. Key to their success was the take-down and securing of a forward operating base, approximately 110 miles north, dubbed FOB Cobra. This base would afford the division a refuel, refit and rearming position from which to launch deep air and air assault attacks further north into Area of Operations (AO) Eagle. As with any operation, the division would move in phases with lead elements under control of the ACP, securing an area for the onward movement of the DMAIN and ultimately the DREAR. This required effective command and control from the TAA to the FOB and beyond into AO Eagle.

A communications system was designed that would "pull" the division into FOB Cobra, and allow for follow-on force projections into AO Eagle. After the system was sufficiently anchored within FOB Cobra, follow-on division elements could both deploy to Cobra from the TAA and then, as required, from Cobra forward. FOB Cobra was about one square kilometer. Communications in and around the FOB were line-of-sight multichannel and single channel radios. Communications from FOB Cobra rearward and forward were multichannel TACSAT (AN/TSC-93/85) and tropo (AN/TRC-170). Tropo was to be used as the backbone/anchor means of communications and multichannel TACSAT as the pivotal means for follow-on movement. As G-Day approached, the battalion prepared a small node communications package for movement forward. This package contained four AN/TRC-145s, one AN/TCC-41(V3), one AN/TSC-85B, one AN/TRC-170, and a battalion control element (TAC). The package was tailored specifically for the operation; it was lean because movement space on the division main supply route (MSR) was limited. The package was attached to the lead



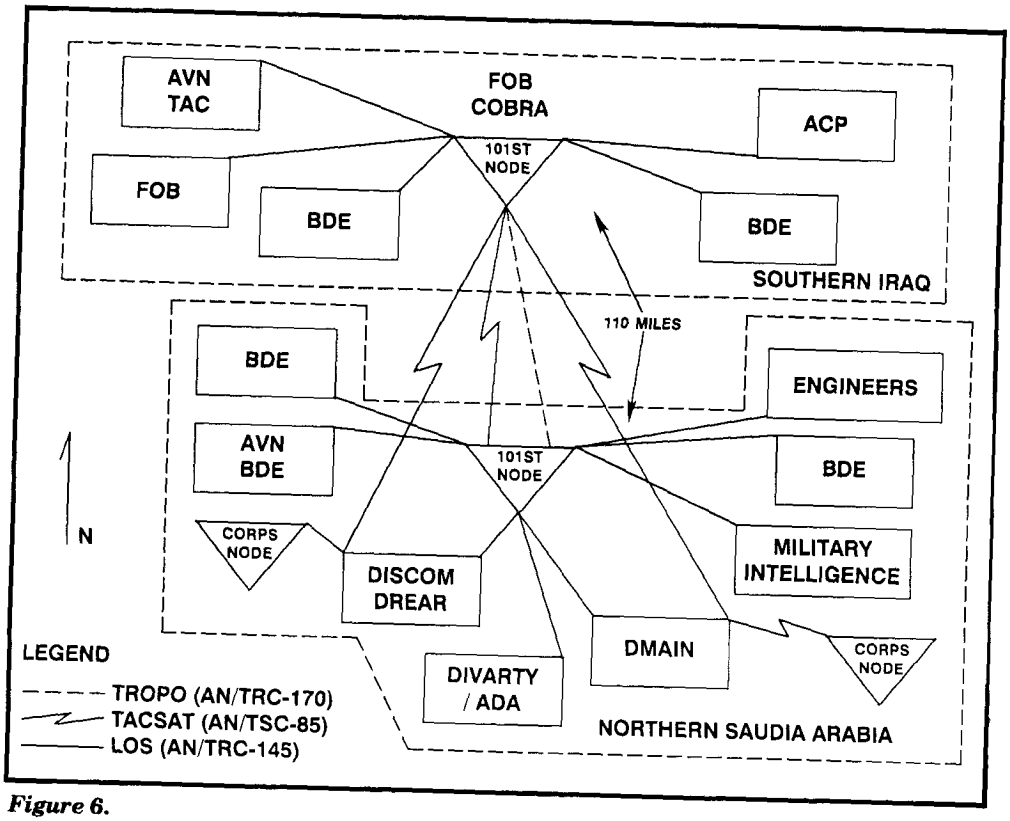


Figure 6.

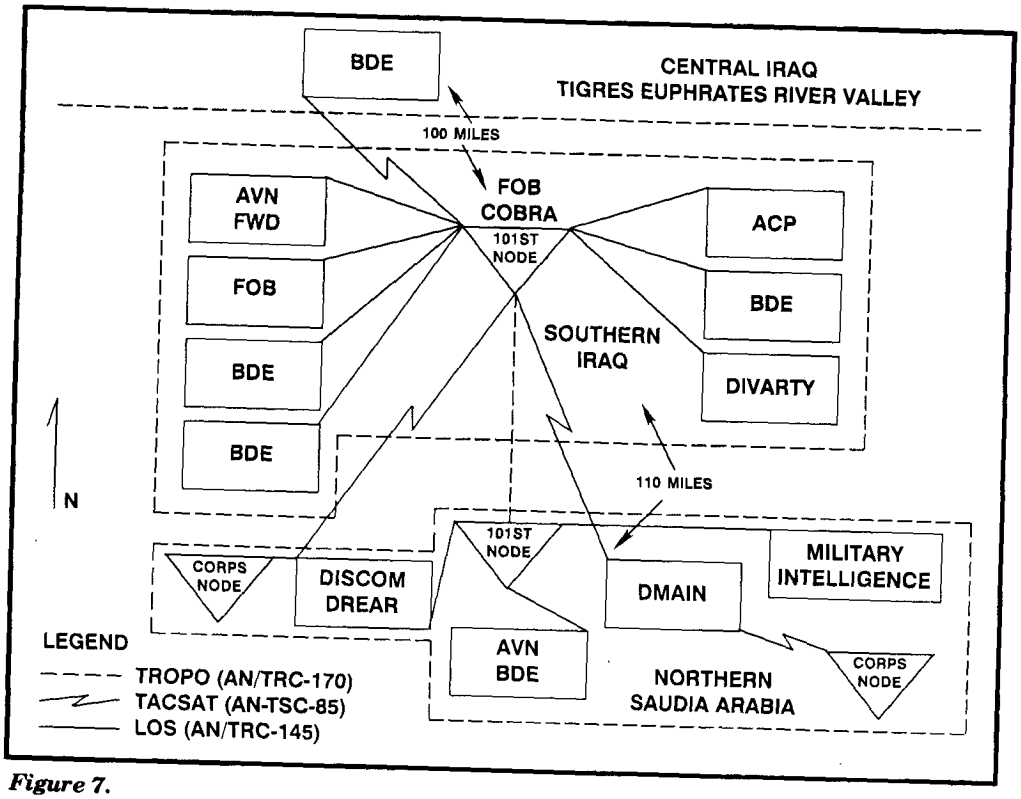


Figure 7.

brigade task force on G-1 (G-Day minus one day). The 501st Signal Battalion node crossed the line-of-departure (LD) on G-Day at H+3 (hostility hour plus three hours on 24 Feb 91).

The movement north took about eight hours. During movement and initially upon arrival at FOB Cobra, single channel TACSAT (AN/PSC-3) and FM communications were used. This means of communications held for the next 24 hours as the FOB was secured and units staged/deployed in place. At about 70 minutes after Signal units were permitted to set up, both tropo and multichannel TACSAT systems were established between the TAA and FOB Cobra. Telephone trunking and circuits were established minutes later, and telephone communications replaced push-to-talk radio command and control.

Figure 6 depicts the communications system on G-Day/G+1. Figure 7 depicts the system at G+2. Note how tropo became the primary means between the nodes as multichannel TACSAT shifted focus and afforded command and control for force projection (Infantry brigade) northward into AO Eagle. This system afforded reliable communications from the Division MAIN/REAR to forward elements in the Tigris-Euphrates River Valley and, as required, allowed the MAIN to disengage and move forward with flexible C2 relegated to either the ACP or DREAR. The ability to maintain split TOC/TAC, Forward and Rear, etc., evolved from the policy and local doctrine developed during covering force operations. The capacity to effectively communicate with forward and rear operation centers significantly enhanced the flexibility to synchronize future operations/onward movement requirements. Additionally with direct multichannel links established from the MAIN and DISCOM/DREAR to the forward node, the rear node could,

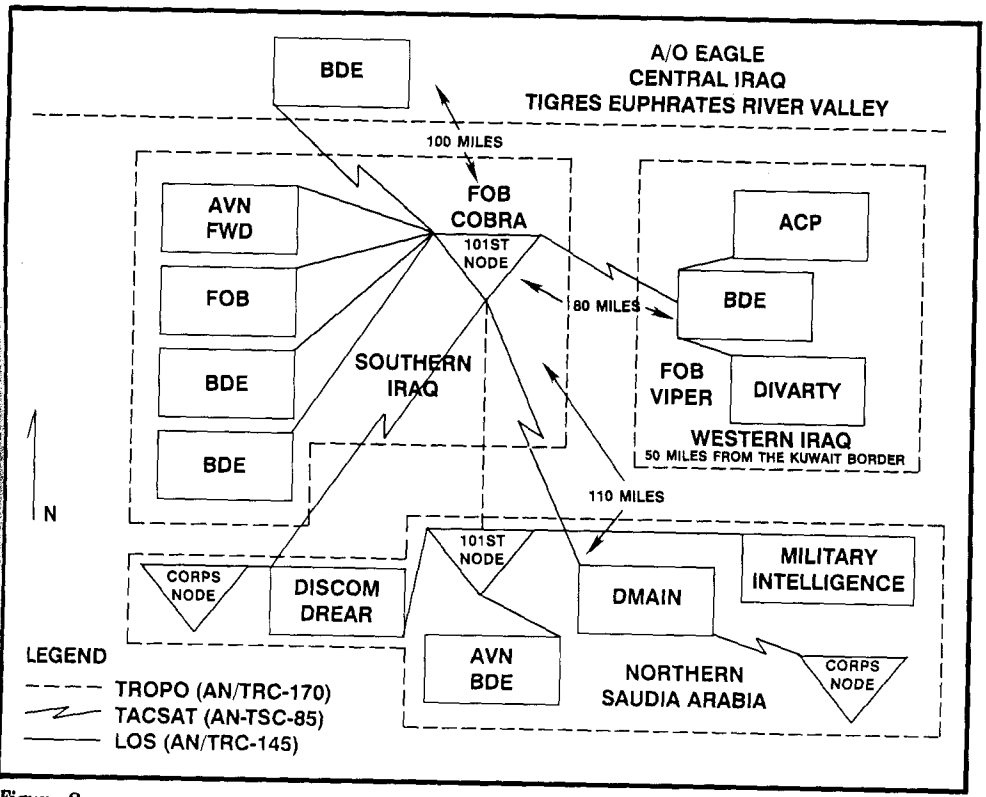


Figure 8.

if required, break the tropo system and move forward as a reserve for future operations, eventually establishing a tropo system to receive the division in their second objective area, FOB Viper. The key to movement was the resounding success of the communications system.

Once installed, the system maintained a near 100 percent reliability rating. Equipment that had never been tested in wartime was performing to near perfection under adverse battlefield conditions and in an unforgiving desert environment. The system was installed during darkness, in a torrential rainstorm, with winds in excess of 35 knots. Call complication rates were about 85 percent and steadily improved with the weather. As the system "locked in" and anchored around the forward node, the rear node, as planned, broke system and prepared for movement forward. Since the ground war was accelerating, the remainder of the S3 staff and battalion commander moved with the node. The intent was to arrive at FOB Cobra, stage, and move eastward toward Basara and install a communications node capable of receiving the division at FOB Viper during combat operations. This action did not occur.

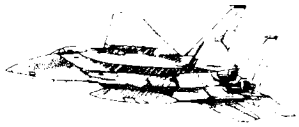
The ground war was moving quickly. The division was tasked to displace a brigade task force including combat aviation eastward and defeat remaining elements of Iraqi forces. The forward Signal battalion staff assembled a small node package to support this mission. The node consisted of two AN/TRC-145s, an AN/TCC-41(V2) and an AN/TSC-93. We installed the system that connected FOB Viper with FOB Cobra and ultimately the DMAIN in the TAA. This system is represented in Figure 8. This became the end state of offensive communications supporting the ground war. As the battalion headquarters arrived at FOB Cobra, around midnight of 28 Feb 91, a cease-fire was initiated. The system, as shown in figure 8, remained in place for another seven days so as to afford an orderly redeployment and withdrawal from Iraq. Redeployment communications were for the most part uneventful. Long-haul systems (tropo and multichannel TACSAT) provided alternating backbone systems that supported the division's movement back to King Fhad International Airport, Camp Eagle II, for the journey home.

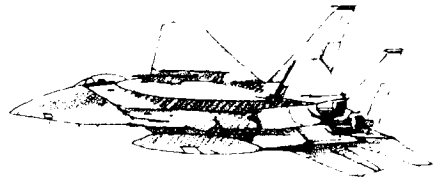
During one period of time, while redeploying, the division communications system coverd an 800-mile by 300-mile area, ranging from the Tigris-Euphrates River Valley in Iraq, to Southern Saudi Arabia. More importantly, the system worked and worked well, as it did through all phases of Desert Shield and Desert Storm.

Conclusion

The elite fighting forces of the 101st Airborne Division (Air Assault) expected, deserved and received high quality communications which, in the opinions of the authors, served as a combat multiplier throughout the desert experience. As the meager base communications system grew, it facilitiated planning for the covering force operation. Training and concepts perfected during the covering force communications led to the provision of quality communications as the division postured for war in the TAA, and ultimately, executed its wartime mission.

Retrospectively it all seemed easy. All the pieces seemed to fit or fall into place. Further analysis, however, indicates key leader foresight, battle





focused planning, the flexibility to adapt to changing missions and package communications equipment to meet any requirement, as well as mission execution by America's finest Signal soldiers contributed to the resounding communications success. While initial images of Desert Shield revealed soldiers waiting for things to happen, Signal soldiers made things happen. Proactive, subscriber oriented Signal support early on led to communications success throughout the entire desert operation.

As soon as operational planners disseminated future missions and locations, Signal planners developed supporting plans and executed test shots from every known location. This provided reliable training not only in communications skills, but also associated soldier skills such as map reading skills, desert orientation and Signal site set up. Test shots, coupled with follow-on CPXs, conducted from a seemingly infinite number of desert locations and non-descript hilltops, provided ample opportunity to practice and fine tune the installation, operation and maintenance of communications.

Through constant and consistent trial and error, we knew what would work and what would not. We knew the status of the equipment and where the equipment was located. We packaged the equipment to meet operational requirements, and, ultimately, effectively supported the combat operation.

The AN/TRC-179 (tropo) and AN/TSC-85/93 were tested on the modern battlefield and performed with paramount, unwavering success. The AN/TCC-41 was unmatched in both network trunking and high call completion rates. Our highly trained Signal soldiers pushed the system to the max and the system responded.

The 501st Signal Battalion—the Voice of the Eagle—ensured that America's Screaming Eagles could talk on the battlefield.

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