

Linking the 3rd Infantry Joint Network

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“Wideband satellite access is the life blood of the maneuver fight for a Corps in the attack, a Division in the attack and, in many cases, a Brigade in the attack,” remarked V Corps Commander LTG William S. Wallace when describing lessons learned from Operation Iraqi Freedom (OIF) operational communications.

OIF communication requirements and the Army’s conversion to modularity have generated a near-term need to rapidly design and deploy a flexible and highly mobile communications capability in lieu of Mobile Subscriber Equipment (MSE) and Tri-service Tactical Area Communications (TRI-TAC). The answer to this near-term requirement is the JNN architecture.

JNN will eventually replace MSE and TRI-TAC as the Army’s mobile battle command communications system. (U.S. Army photo.)

Division (3ID) Into the Node (JNN)



The 3ID is the first unit to be fielded with JNN equipment. Developing and fielding the JNN solution took place over a 12-month period that culminated with a unit Maneuver Rehearsal Exercise in late 2004. Currently, 3ID is deployed in support of *OIF* and employs the JNN network to support battle

3ID is deployed in support of *OIF* and employs the JNN network to support battle command communication requirements.

command communication requirements. This network supports medium to larger command posts at the unit of employment-x (UEX) and brigade combat team (BCT) level and small command posts (CPs) at the battalion (Bn) level. The deployed JNN network also interfaces with multiple networks within theater

including deployed MSE and TRI-TAC systems; infrastructures at posts, camps and stations under the Iraqi commercialization effort; and Defense Information Systems Network (DISN) points of presence (PoPs) within theater.

The JNN is a Program Executive Office (PEO) Command, Control and Communications Tactical (C3T) non-developmental item rapid-acquisition effort using government-off-the-shelf (GOTS) and commercial-off-the-shelf



In response to combatant commanders' pleas for more flexible and highly mobile communication capabilities in Iraq and Afghanistan, JNN will provide the necessary modularity to support emerging bandwidth requirements. Here, SSG Clayborne Taylor, Network Switching Operator, 3ID Detachment, 3rd Signal Co., powers up switching equipment inside the JNN. (U.S. Army photo by Timothy L. Rider.)

(COTS) equipment to provide beyond-line-of-sight (BLOS) connectivity, communications at-the-quick-halt and the extension of DISN services. Additionally within the JNN architecture, tactical communications will be extended to Bn level within the BCTs

and support brigades under the UEx modularity construct.

The JNN architecture is an Internet Protocol (IP)-based solution for voice, data and video teleconferencing (VTC) supported by a Ku/Ka Satellite

Communications Time Division Multiple Access (TDMA) network for intra-JNN connectivity and a Frequency Division Multiple Access (FDMA) network for Joint and Global Information Grid (GIG)/DISN connectivity.

JNN Architecture

The JNN architecture is composed of three primary systems that support user requirements and provide intra-JNN network connectivity and inter-theater connectivity. The JNN Unit Hub Node (UHN) is the cornerstone of the JNN network. The UHN supports TDMA and FDMA satellite connection management for all elements of a UEx's JNN network and acts as a base-band or tactical technical node facility as depicted in Figure 1. The UHN will support TDMA bandwidth requirements up to 40 megabits per second (mbps) and FDMA bandwidth up to 36 mbps.

The UHN base-band assemblage performs two key functions: intra-JNN network routing and GIG/DISN connectivity. The intra-JNN network routing allows for the bridging across TDMA meshes at the UEx and BCT level within the architecture. This keeps network routing to no more than two satellite "hops" within the TDMA network, which optimizes the transport network and reduces latency issues. At the GIG and DISN interface level, the UHN acts as a Tier 1/2 interface to a DISN PoP. This direct interface to the DISN allows the JNN-equipped warfighter the ability to access robust DISN services from a tactical environment down to the Bn level.

Battle Command Capability

At the UEx and BCT level, the JNN is the primary means of meeting battle command requirements at the CP

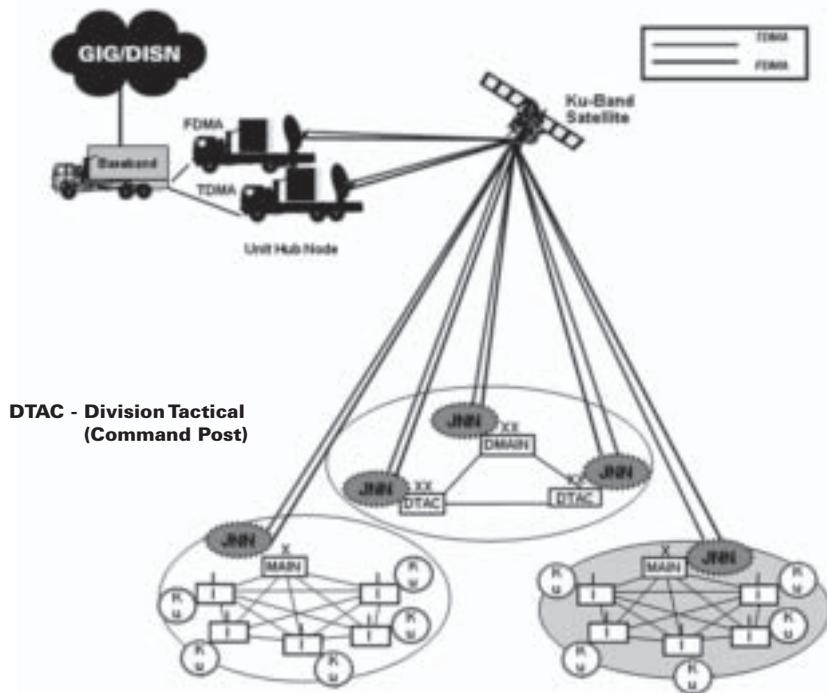


Figure 1. JNN Unit Hub Node Connectivity

provide redundant connectivity between JNNs at an aggregate bandwidth up to 18 mbps.

At the Bn level, the JNN Bn CP Node supports battle command requirements. The Bn CP Node is based on the same 2.4 meter Ku/Ka satellite terminal as the JNN. The Bn CP Node shares a 4 mbps TDMA mesh with its parent BCT and the other Bns assigned to the BCT. Subscriber services are extended via transit cases to the individual CP directly from the satellite terminal. At the Bn level, network services are limited to SIPR and secure voice-over IP.

Connectivity and Reachback

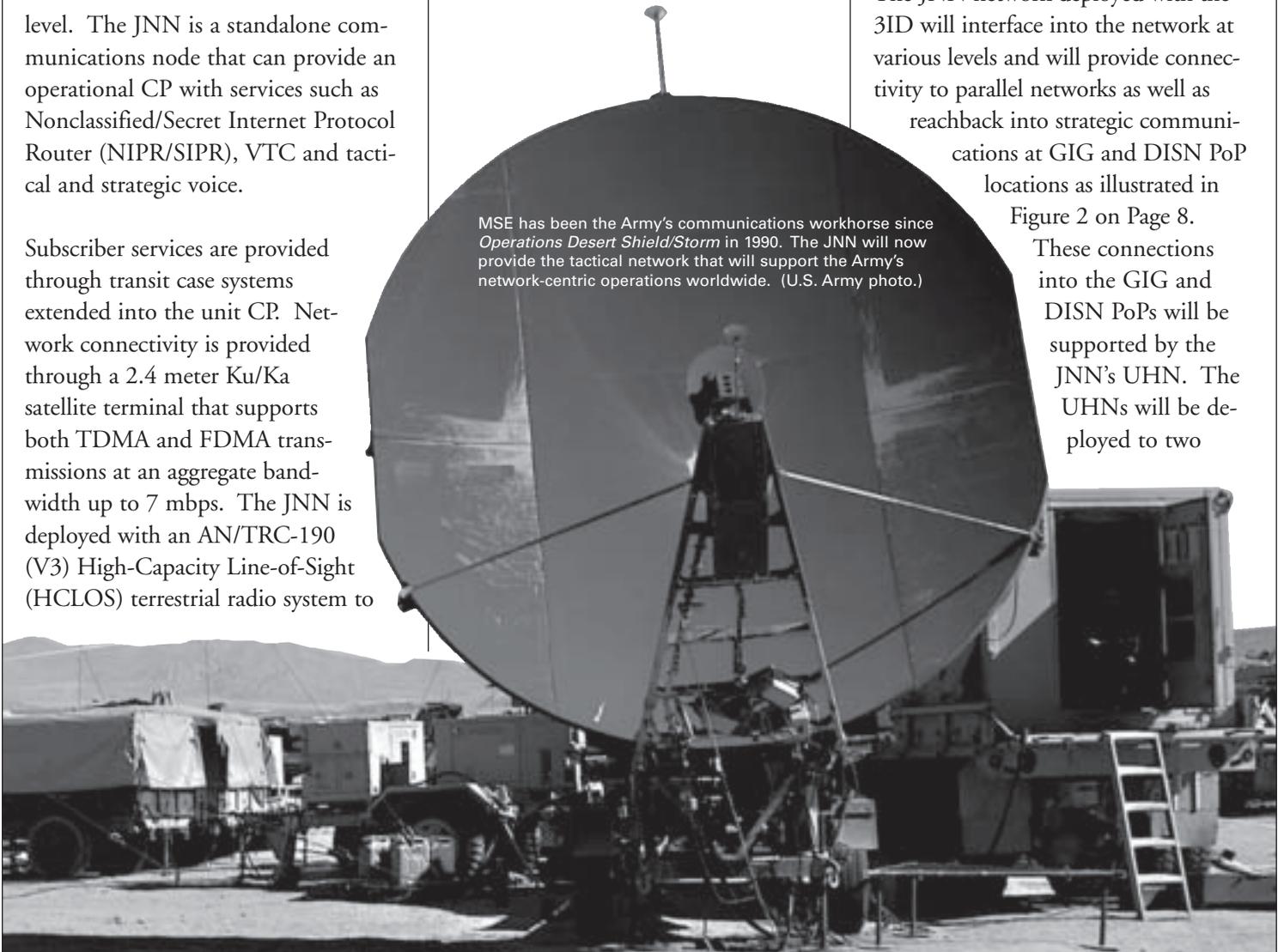
The JNN network deployed with the 3ID will interface into the network at various levels and will provide connectivity to parallel networks as well as reachback into strategic communications at GIG and DISN PoP locations as illustrated in Figure 2 on Page 8.

These connections into the GIG and DISN PoPs will be supported by the JNN’s UHN. The UHNs will be deployed to two

level. The JNN is a standalone communications node that can provide an operational CP with services such as Nonclassified/Secret Internet Protocol Router (NIPR/SIPR), VTC and tactical and strategic voice.

Subscriber services are provided through transit case systems extended into the unit CP. Network connectivity is provided through a 2.4 meter Ku/Ka satellite terminal that supports both TDMA and FDMA transmissions at an aggregate bandwidth up to 7 mbps. The JNN is deployed with an AN/TRC-190 (V3) High-Capacity Line-of-Sight (HCLOS) terrestrial radio system to

MSE has been the Army’s communications workhorse since Operations Desert Shield/Storm in 1990. The JNN will now provide the tactical network that will support the Army’s network-centric operations worldwide. (U.S. Army photo.)





JNN is a PEO C3T nondevelopmental item rapid-acquisition effort using GOTS and COTS equipment to provide critical BLOS connectivity. (U.S. Army photo by Michael Castellana, Project Manager Tactical Radio Communications Systems.)

sanctuary locations within a theater that have robust bandwidth and redundant connectivity to the GIG/DISN. The UHNs will support the routing of reachback voice, data and VTC through their network interfaces to DISNs that include SIPR and NIPR: Tier 1 and/or Tier 2 routers, Defense Switched Network Private Branch Exchange interface and Prominia circuit interfaces.

With the UHNs in place to support GIG/DISN connectivity, the deployed JNNs will establish connectivity to the UHN over a TDMA satellite connection via a mesh configuration and over FDMA satellite via circuit-based connections. The UHN will support all intertheater network routing via its GIG/DISN connections. Additionally, the UHN will support JNN-to-JNN

network routing across established TDMA meshes between JNNs. Bn CP Nodes within the JNN network will gain network access by routing through the parent JNN within their assigned TDMA mesh. The parent JNN will determine and complete the required routing to the UHN to establish GIG/DISN connectivity or routing to another JNN or Bn CP Node in another JNN TDMA mesh.

Parallel to its connectivity to the UHN, the JNN can establish direct connectivity to a DISN Strategic Tactical Entry Point and/or another tactical network through current military satellite systems such as the AN/TSC-85 or 93, Secure Mobile Anti-jam Reliable Tactical-Terminal (SMART-T) or Phoenix terminal and terrestrial radio systems.

Future Baseline

The 3ID's JNN architecture fielding and employment are the building blocks for future *OIF* rotations and for developing modular communications tactics, techniques and procedures for

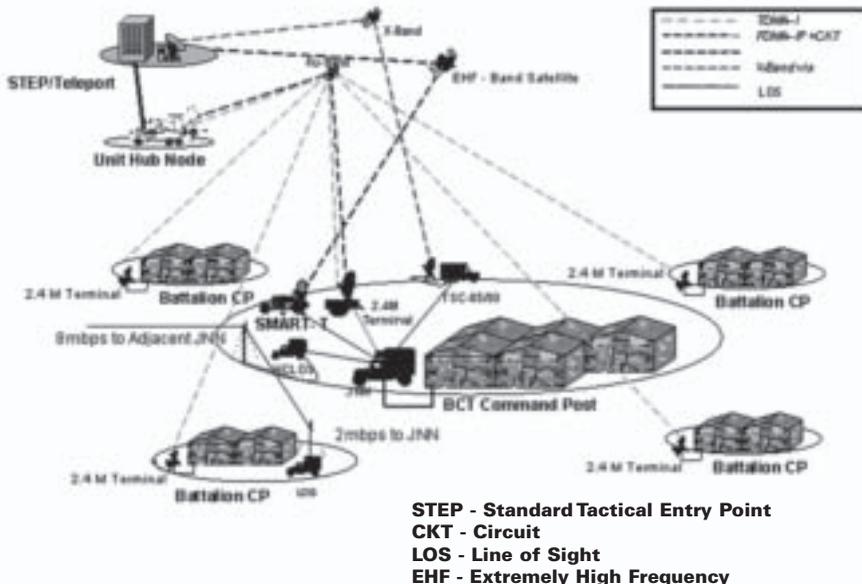


Figure 2. BCT Connectivity to the UHN



The UHN supports TDMA and FDMA satellite connection management for all elements of a UEx's JNN network. Here, SFC Nixon Camper, 3ID 3rd Forward Support Battalion, checks his operational connections as he brings the system on line. (U.S. Army photo by Stephen Larsen.)

units that will be converting to modularity in the coming years. The JNN network's ability to support multiple tactical and strategic network interfaces will be exercised to its fullest extent during 3ID's deployment. As a result, this network architecture will test all aspects of supporting dispersed units on a nonlinear battlefield, operating in a Joint and coalition environment and will establish the baseline for network-centric operations.

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