

up and running their network. Most BCTs come to the National Training Center not having fully run all of their communications systems at home station. They have great difficulty in doing it for the first time at their last major collective training event prior to deployment under the current paradigm.

With the addition of computer networks integral to communications within our formation, commanders need to know what they have plugging into that network and that their anti-virus and Windows System Update Servers are functioning and protecting the entire network from attack. The company intelligence support team (generally referred to as CoIST) has the capability of accessing NIPR and SIPR systems. Poor business practices or lack of training and understanding can easily result in information assurance violations at a minimum by spillages from a SIPR to a NIPR system or the CoIST team could inadvertently introduce a virus into a SIPR system and cripple the entire network. Business rules and training are of paramount importance across a BCT to protect our network as access to SIPR is now at lower levels than ever.

Leader checks of these “business rules” are critical to the protection of the entire network as we have now pushed SIPR down to troop/company/battery level. At the BCT and below level, the statuses of our command, control, communications, computers, information, surveillance and reconnaissance systems now drive the drafting of friendly forces information requirements so that commanders are informed of issues with their network. (See Figure 2)

Units now have the ability to talk further, faster, and with greater data throughput than ever with robust voice communication platforms, full motion video capabilities and Blue Force Tracking systems. Commanders now have the ability to conduct ‘face to face’ meetings with subordinate commanders through video teleconferencing means enabling immediate feedback during ongoing operations. With all these systems being integrated into a single network, the Signal community has become more important than ever before in ensuring the commander’s ability to command and control all units across full spectrum operations. As newer C4I systems are fielded, the brigade combat team’s challenges are numerous but can be easily mitigated through proper planning and training during home station operations. At the NTC, five “NTC Best Practices” have been identified to ensure successful Signal teams:

- 1) Signal Team and Systems Training
- 2) Network Tools and Bandwidth Management
- 3) Battle Tracking

- 4) Military Decision Making Process / Troop Leading Procedure Process
- 5) Synchronization between BDE / BN S6 Teams and the Signal Company

Signal Team and Systems Training

Each Signal team must conduct tough, realistic and relevant training prior to arriving at the NTC. Signal training and maintenance should be incorporated into every training schedule for a BCT at home station. Weekly command maintenance should include pushing out retransmission systems and conducting radio checks with all vehicles and TOC kits. Additionally, units should conduct communications and electronic Maintenance with all JNN/CPN crews standing up their respective systems for training and testing with the BCT NETOPS cells and Network Tech leading the training and maintenance efforts. Quarterly signal team crew drill certifications (similar to Bradley/Tank table 8) should also be integrated into collective training plans.

Finally, commanders won’t really know their weak links in their network until they place a “load” on these systems. BCT leaders at echelon can assist in this process by implementing communications exercises as part of regularly scheduled maintenance periods and collective training events in order to “stress test” their network and gain proficiency over

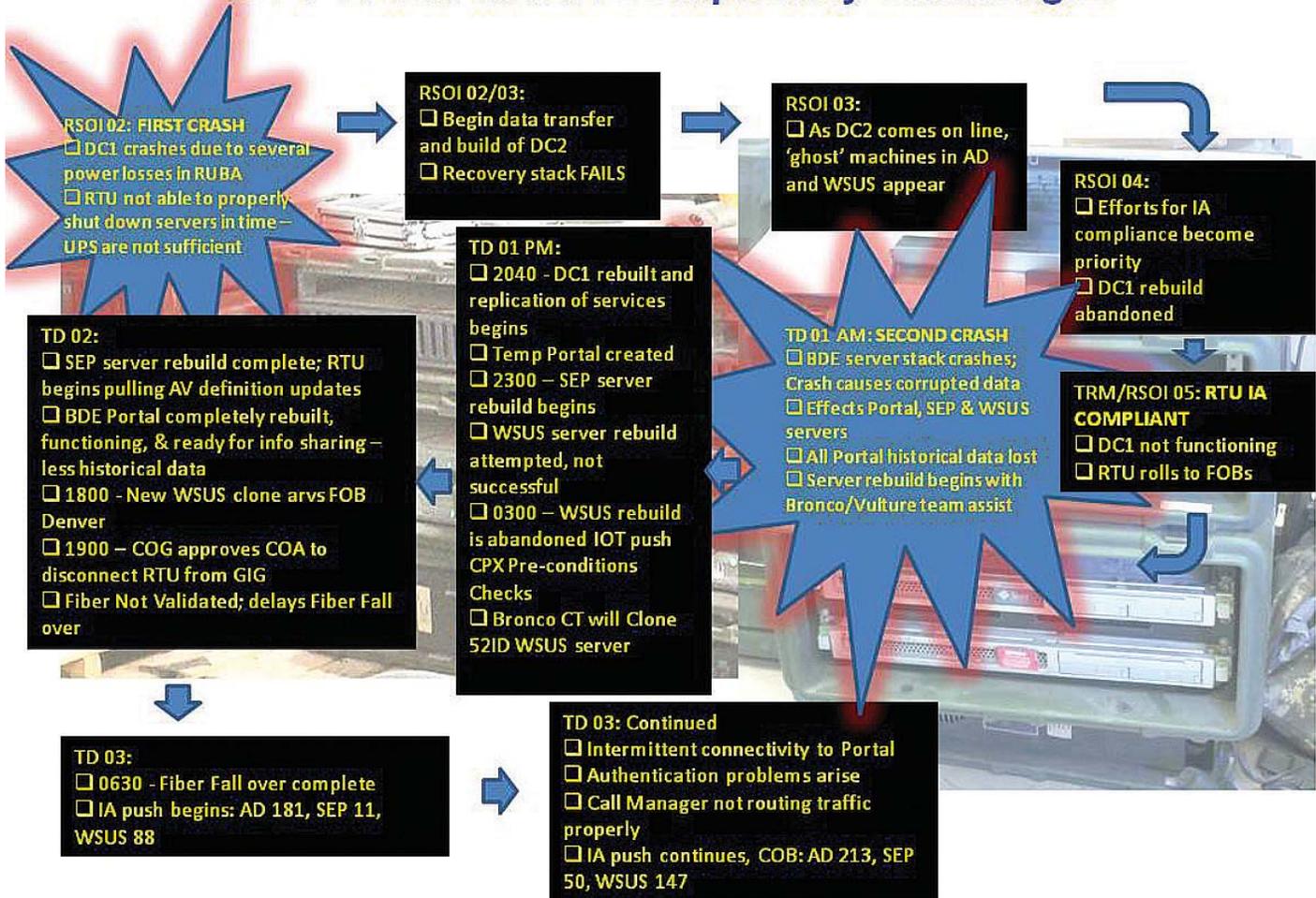
(Continued on page 40)

BDE/BN CDR Signal TTPs

- **Understanding Command and Control Structure (C2)**
 - Relationships bet.: BSTB Commander, Brigade S6, Signal Company Commander, NETOPS
- **Information Assurance (IA)**
 - All systems managed; server is able to update over the Network
 - SNAP integration into CoIST/STT teams
- **Communications and Technical Support Requirements (FSR)**
- **Type of communications / ABCS assets inherent to the unit**
- **Spectrum requirements**
 - FM (organic/nonorganic units)
 - UAS RETRANS capabilities
- **SharePoint**
 - Enables Knowledge Management and Collaboration
- **Network Registration**
 - Must be checked for any changes; if not correct will be unable to connect outside the units Network
- **Digital / NET Training**
- **COMSEC requirements**
- **Network/Signal CCIR and Wake-up Criteria**

Figure 2 -- Brigade and Battalion Commander Signal Tactics, Techniques, and Procedures, MAJ Manning, Lou, RSOI Teach, 2009

DC1 Crash and IA Compliancy Challenges



(Continued from page 39)

repetitions. We should execute the load on these systems tactically so that we do not become reliant on something we may not have in a tactical environment such as a fiber network. No roll out from the motor pool should occur without a digital command and control exercise rehearsal so we start training with a functional network that we can stretch out in training.

The BCT must stand up its entire "enterprise network" in order to validate network registration, advertisement, functionality, and information security posture prior to arrival at the NTC. This should not be accomplished during the units final FTX, but rather in progressive phases. Dismounting non-classified internet protocol routing / secure internet protocol routing stacks from shelters while conducting cable exercises and data exercises can be a huge benefit to units that are unfamiliar with the systems or lacking in their skill sets.

The S6 needs to be involved with the tactical operation center design alongside the S3 team in

order to develop a cable plan for wiring in the TOC. This will help reduce the time needed to wire the TOC during subsequent setups and help the S6 team estimate how much cable will be needed for future FTXs. Additionally, units are encouraged to conduct full scale staff integration exercises where all ABCS systems are integrated into an exercise no matter how small or seemingly insignificant. Soldiers become more proficient on ABCS when they are 'put in play' and not an afterthought.

Information assurance has become a major hurdle that affects rotational units' ability to transition from RSOI to STX/FSO. The focus on warfighter planning and training is disrupted when BCT S6 teams do not take proper precautions regarding IA; meeting regulatory compliance for all systems prior to movement from the LSA is non-negotiable. RTUs that fail to meet compliance standards lose valuable training time in the box. This is clearly commanders' business as the inability to establish IA for the BCT and below network may lead to that network failing when we need it most for battle command.

Commanders must be actively involved.

Trained and disciplined signal teams include FM RTXs, JNNs, and CPNs that can react successfully to "time sensitive operations" and adjust effectively to contingency missions. The key to successfully trained Signal teams and systems takes extensive planning at the BCT S6 level along with network Signal company support and greater amounts of emphasis from commanders. If the command teams are not supportive of Signal team training, failure is right around the corner.

Network Tools and Bandwidth Management

Every commander feels the need to have massive amounts of bandwidth to push/pull products and C2 subordinate units in their battle space. Commander's at echelon and below must be able to effectively monitor the status of all links/systems higher and lower in their network with all systems in your network: JNN/CPN/SNAP/AN-50, fiber network...).

A commander must be able to know/understand the health of their links in terms of data loss (what links are losing packets and why/where?) Typical systems to monitor network health at the brigade level are Network MRI and Solar Winds which reside in the brigade S6 shop. Commanders must be aware of their network at all times due to its importance in providing essential battle command.

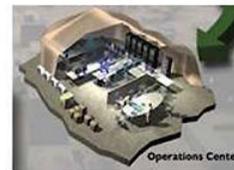
The NETOPS section is the digital quick reaction force for the network and will typically monitor the health of the brigade network. It is important for the NETOPS team to baseline the network so they can track all computer/ABCS systems on the brigade network. The NETOPS team should be asking themselves; are network tools set up to tell us how much bandwidth is being utilized on any given link at any given moment, and what is consuming our bandwidth? Is any staff section trying to email

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Key Tasks for the Installation of the BCT Enterprise Network

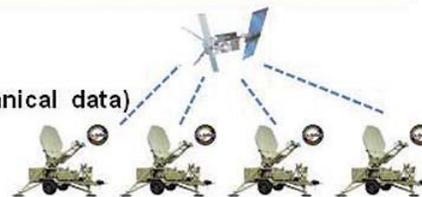
BCT S6

- Establish Administrative control of all BCT Network Assets
- Establish BCT Network Registration with NETCOM
- Certify all BCT signal crews in BCT (CPN/JNN/RTX)
- Certify BCT Network Servers and Service
- Plan the network based on the operational requirements
- Submit Satellite Access/TACSAT/Spectrum MGMT requests for operation & pre-training
- Conduct BCT Switch Exercises based on planned operational network
- Conduct /validate BCT Enterprise network testing/load testing prior to exercise (all systems)



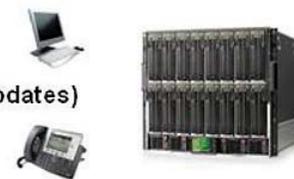
BCT NETOPS

- Configure JNN/CPN Wide Area Network based on operational network plan
- Plan, brief, and issue "Team Packets" for all CPN/JNN crews (all required technical data)
- Conduct training and certification of all BCT JNN/CPNs
- Install, configure, manage BCT Wide Area Network monitoring tools
- Provide C2 and systematic troubleshooting of BCT Wide Area Network



BCT Systems Administration:

- Establish domain network registration with NETCOM
- Build and certify all BCT network servers and services (domain, portal, exchange...)
- Build and certify all BCT IA network servers and services (windows updates/antivirus updates)
- Ensure IA compliance through managed updates for all BCT systems
- Establish & manage BCT helpdesk operations
- Install Local Area Network/TOC internal network infrastructure (helpdesk & NETOPS)



BSTB Signal Company Commander

- Train and sustain BCT JNN/RTX/NETOPS crews
- Conduct joint communications planning with BCT S6
- Employ and sustain BCT JNN/RTX/NETOPS assets IAW BCT communications plan
- Attend daily S6 sync meetings



Figure 3 -- Key Tasks, Nichols, James, Technical Working Group Teach, 2009

(Continued from page 41)

CONOPS and OPORDs that are 30 MBs and higher instead of 3 MBs or lower? These large files can adversely impact a network and slow down the transfer of critical information between higher, lower, and adjacent units.

More than likely units may need to implement procedures to control bandwidth usage, especially at critical times such as during commander update assessments, battle update briefs, and CONOP briefs. Determinations will need to be made on when to shut off the portal (SharePoint) and email exchange systems during these events; possibly placing them on the battle rhythm so that commanders and staff shops are aware. Understanding limitations of the network need to be realized by all staff sections along with the ability to train the brigade staff and provide them the tools to use our network effectively (NXP Lite, other compression capabilities, etc). Managing the network properly will enable all users' effective, efficient command and control capabilities. (See Figure 3)

Battle Tracking: "Seeing ourselves" and understanding system statuses within the brigade at all times is crucial. Unfortunately, "seeing ourselves" seems to be the last thing on any BCT's mind, when it should be their initial mindset. This applies to commanders and signal Soldiers at each echelon. Three important questions arise with "seeing ourselves:" What systems do we have? What systems can we use for missions? When is each system fully mission capable vice non-mission capable, and how soon we can get any system back 'into the fight?

All S6 teams need to have a tracking board displayed with all C2 systems (SVoIP, JABBER, CPOF, FM, TACSAT, HF...etc).

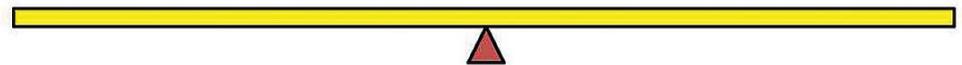
Balancing BCT/BN C2 Responsibilities

BCT Responsibilities

- Enterprise Network Registration
- Information Assurance Compliancy
- WAN/LAN Network Monitoring
- Establish C2 structure
- Validate C2 network structure
- C2 Node Placement
- BDE RTX placement ISO Battle Command
- Digital/New Equipment Training
- Parallel planning with BN S6s
- Signal Asset Visibility
- UAS RTX capabilities
- SharePoint Administration
- COMSEC Custodial Duties
- Establish Signal CCIR / Wake-up Criteria
- SNAP Integration

BN Responsibilities

- Information Assurance Compliancy
- LAN Management Support
- Understand C2 structure
- C2 Node Placement
- BN Signal Support Plan
- Bottom up refinement for C2 plan
- BN RTX placement
- COMMEX with BDE elements prior deployment
- Information Sharing via SharePoint
- COMSEC Responsibilities
- Follow Signal CCIR / Wake-up Criteria
- SNAP Operation



Track this in the S6 shop by unit and use it to keep on top of your network priorities based on your Commander's C2 Intent. Have this tracking system board displayed prominently so that anyone in the S6 shop or a commander can quickly ascertain the status of any system and its inherent capabilities. Tracking systems in Brigade and Battalion TOCs alike that include critical information will provide the commander a visual representation of their network and its functionality.

Going one step further is to post this 'live update' to the unit's SharePoint portal so that the Battle CPT or CHOPs can routinely visit this tracker when operations are forthcoming. Proper battle tracking can also focus your S6 shop priorities. Another important battle tracking tool is a "Horse Blanket Tracker" as well as a COMMO PLL tracker that shows all of the brigade's digital C2 assets and their status. Considering the statuses of our 30-60-90 day

load for COMMO prescribed load list is imperative in keeping any system FMC or possibly being able to quickly repair any system that is NMC. Digital C2 systems are critical assets that enable BCT staffs the ability to C2 their formations across full spectrum operations. Key questions to ask yourself and your team are; Does the person on the late shift know what is going on? What are our next priorities? Do we have a separate tracking board that we brief internal in our S6 shops showing the priorities of work by section?

Commanders that understand their network will require the BCT/BN S6 to brief this daily at various update briefs. Daily shift change briefs that cover battle tracking will ensure smooth transitions during any shift change and build confidence in your subordinates and other staff sections.

One under-trained critical task seems to be participation

of Signal officers in the MDMP/TLP Process. “Staying glued to the hip of your S3,” understanding C2 requirements and the commander’s intent for C2 activities in the battle space are an absolute necessity. Falling behind in the planning process and not fully understanding the commander’s digital C2 needs can adversely impact operations. Asking these simple questions can make you successful; do I have a product that will allow me to rapidly communicate a simple Signal Support Plan to the Brigade? Keeping a Concept of Signal Support simple is always important and can be illustrated via a one page Annex H that looks like a PPT slide or CPOF pasteboard that clearly articulates how you plan to support any mission. Ensure that all the pertinent information is included and verbalized clearly and concisely; identify all pertinent C2 node locations, RTX locations/FREQS, FA gun locations/FREQS, Air weapons team/FREQS, TACSAT FREQS, PACE Plan, task and purpose of RTX teams, frequency information, etc... Ensure the S6 keeps it simple and gets the product to the future / current operations staff in a timely manner so that if any adjustments are needed, they can be done sooner rather than later. If the mission will be conducted on a compressed timeline, ensure you follow up the FRAGO with phone calls, teleconferences, and the like with other S6 elements. Always ensure that the Concept of Signal Support is understood down to the lowest level and could be considered an enhanced vehicle drivers commo card. (See Figure 4)

Lastly, synchronization between the BDE and BN S6 Signal teams and Signal company must occur frequently. A fundamental flaw within the Signal community is the inability to communicate a clear and concise concept of

Signal support. BDE, BN S6 teams and the SICO need to talk to each other daily through a synchronization meeting that is ideally published on the BCT Battle Rhythm. Communication and synchronizing signal support planning does not begin 24 hours prior to any operation. It begins much earlier once the BCT S6 understands the current mission and provides their plans on supporting that mission while incorporating the brigade’s full signal capability package. BDE/BN S6 and SICO elements must

talk and synchronize their efforts ensuring seamless communications for all warfighters. The BCT S6 Concept of Signal Support should incorporate BN S6 concepts and vice versa.

During sustainment operations, there should be no less than bi-weekly phone conferences or Adobe Connect Pro meetings between the BCT / BN S6 teams and the SICO in which critical information and ideas are exchanged. At echelon and below

(Continued on page 44)

[Classification]

Include heading if annex distributed separately from base OPLAN/OPORD.
ANNEX H (COMMAND, CONTROL, COMMUNICATION, and COMPUTER OPERATIONS)
TO OPERATION ORDER NO ## [code name]—[issuing headquarters]

1. SITUATION.

a. Enemy forces. Refer to annex B, appendix 1-Intelligence estimate. Also provide enemy capability and activity by describing enemy capabilities that may affect communications systems.

b. Friendly forces.

- Primary communications gateways providing connectivity to higher, lower, and adjacent units.
- Critical communications security measures required to counter expected enemy EW capabilities and protect C2 systems.
- External communications assets that augment signal support unit capabilities.

c. Environment. In separate subparagraphs list all critical terrain, weather, and civil considerations that would impact C4 operators. Refer to appropriate annexes as required.

d. Attachments and detachments.

2. MISSION. State the computers and information systems operations mission in support of this operation.

3. EXECUTION.

a. Scheme of signal support operations.

- (1) Describe the concept of signal operations, including primary and back-up systems supporting critical C2 networks.
- (2) Outline the plan for extending C2 systems by each phase of the operation.
- (3) List critical links between tactical and strategic communications systems.
- (4) Identify critical limitations of organic signal support assets. Define limitations of assets from higher headquarters.
- (5) State signal support tasks that all non-signal units must perform to accomplish missions and tasks beyond normal requirements.
- (6) State signal support priorities.

b. Tasks to subordinate units.

- Signal support tasks that maneuver elements must accomplish that the base OPLAN/OPORD does not contain.
- Signal support tasks that signal units supporting maneuver elements are to accomplish only as necessary to ensure unity of effort.

c. Coordinating instructions.

- Critical signal support instructions not already covered in the base OPLAN/OPORD.
- Key times or events critical to information systems and network control procedures.
- Army Battle Command System control procedures.

4. SERVICE SUPPORT.

5. COMMAND AND SIGNAL.

- a. Identify C2 systems control hierarchy for the common user network.
- b. Identify local area network control procedures for network administration and management.
- c. Use appendixes to diagram any changes to standard communications networks.

ACKNOWLEDGE: (if distributed separately from base order)

[Authenticator’s last name]

Figure 4. Signal Annex H, FM 6-02.43 Signal Soldiers Guide

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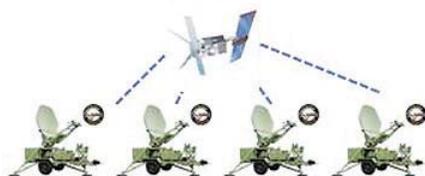
all teams need to understand signal concepts and be able to react to shortcomings and friction points in order to meet the commanders C2 intent. With the number of multiple subordinate headquarters continually increasing due to the amount of C2 systems in formations, both in garrison and deployed environments, there is a amplified need for BCT level oversight. At the end of the day, the BCT S6 team is in charge of all C2 systems ensuring their ability to provide the brigade commander ready and reliable battle command. There is a misconception that the Signal company or battalion owns the JNN/CPNs. This is

untrue. The brigade commander owns all Signal systems. It is the responsibility of the BCT S6 to properly manage those assets to meet the brigade commander's intent and guidance for digital C2 communications. This relationship between commanders and their S6 or communications personnel continues to be true at echelon.

Depending on how the SICO is arrayed and their location on the battlefield, they play a vital role in supporting the brigade staff with WAN connectivity as well as VTC suites and full motion video support. The SICO must know and understand what missions the brigade needs to accomplish in order to fully support FSO. Being

able to plan without formal orders is a key component for conducting synchronization meetings. With all teams on the same sheet of music, signal assets can be surged or redirected to support the BCT. The Signal Company executes all signal missions as dictated by the BCT S6; therefore it is imperative they understand all Signal Concepts of Support. Synchronization between higher and lower Signal teams is a key function that will ensure concepts of signal support are capable of providing reliable communications. A few critical questions that should be asked to limit these friction points can be: What issues do the battalions have? What resources do they

XX BCT Signal Network "Road To War"

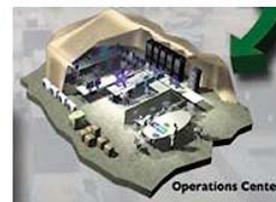


Current XX BCT Network

- Redundant Network Servers
- Exchange Email
- Asset visibility
- JNN/CPN Redundant HCLOS
- RETNIA / QTIP Network Scans
- BCT Network Monitoring Tools
- Automated Help Desk Operations
- CAT5 and Network PLL?
- FM Fires Net
- MBCOM/C2V
- CPPs
- XX BCT Network Registration
- JNN/CPN Satellite Network
- Primary Network Servers/Services
- SAV/WSUS IA Services

XX BCT Deployed Network Considerations

- BCT JABBER/MiRC Server
- FOB Network Support
- BCT NIPR Servers/Services
- Signal Entry Package
- SC TACSAT Network
- TPE Automation
- TPE Signal Sys (SNAP/AN80)
- Power 120 vs 210
- Power Generation Maint.
- Kuwait DOIM Requirements
- Network/Automation PLL
- "Black Out" Procedures
- Horse Blanket Tracker (Portal)



XX BCT RSOI NETWORK

- XX BCT Network Registration
- Primary Servers & Services
- WSUS Servers/Services
- SEP Servers/Services
- Information Assurance
- JNN/CPN Satellite Network

Battle Command System of Systems Integration Training (BCSoSIT and the BCT)



Cmd Post Integration Trng

- **KeyTasks:**
- **Establish the Command Post**
 - Establish the SICPS
 - Establish the Power Grid
 - Establish Section Cells
 - Establish the Network
 - Conduct Command Post Network Validation (Voice and Data)
- **End State: Successful integration of all CommandPost equipment. Unit is confident in their ability to setup and integrate their equipment and restore capability upon major failures.**



Staff Integration Training

- **KeyTasks:**
- **Process Higher Command's Operations Order**
- **Develop Staff Products**
- **Create a Common Operational Picture**
- **Conduct a Collaborative Briefing using INFOSYS**
- **Publish Unit Order**
- **Process CCIR**
- **Execute Practical Exercise**
- **End State: The staff has increased confidence in abilities to execute command post operations by collecting, processing, displaying, disseminating and storing relevant information using the Information Systems (INFOSYS).**



Cmd Post Integration Exercise

- **KeyTasks:**
- **Tailored to a specific unit training event, i.e., existing CPX**
- **Provide Over the shoulder support to unit Battle Staff in CommandPost**
- **Unit Training Objectives focused on integration of CommandPost equipment (Information Systems (BC Systems), Network)**
- **End State: The battle staff has confidence in their ability to Establish the Command Post, Manage Tactical Information, and conduct CommandPost Operations.**

7

have (if there are shortcomings), what can the brigade comms team provide? How can we better support our subordinate warfighters with digital C2 systems?

The Army's battle command systems and capabilities will continue changing dramatically as modularity effectively extends the battlefield. For brigade signal teams, being able to effectively manage and meet the commanders C2 requirements are contingent on following the five "Best Practices" described

above. Leaders must also take an active part in providing training guidance to build the skills to enable battle command within their organization as well as they must understand the capabilities of their network and what checks they need to make to ensure that the organization's C4ISR systems are available and reliable. Units with leaders who wash their hands of the details and leave it all to the signal MOS Soldiers will either knowingly or unknowingly assume risk to their ability to command their organization.

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S3; 1st Company 1st NATO Signal Battalion commander, Maastricht, the Netherlands and ISAFI; and Company B commander, 40th Signal Battalion, 11th Signal Brigade, Fort Huachuca, Ariz., and Operation Iraqi Freedom I and II.

Join the Discussion
<https://signallink.army.mil>



ACRONYM QuickScan

ABCS - Army Battle Command System
AFATDS - Advanced Field Artillery Tactical Data System
AN-50 - Line of Sight Radio Platform
ARFORGEN - Army Forces Generation
BCCS - Battle Command Common Services
BCS3 - Battle Command Sustainment Support System
BCSoSIT - Battle Command System of Systems Integration Training
BCT - Brigade Combat Team
BDE - Brigade
BN - Battalion
BUB - Battle Update Brief
C&E - Communications and Electronic
C2 - Command and Control
C4ISR - Command, Control, Communications, Computers, Information, Surveillance and Reconnaissance
CCIR - Commander's Critical Information Requirements
CoIST - Company Intelligence Support Team
COMMEX - Communications Exercise
COMSEC - Communication Security
CPN - Command Post Node
CPOF - Command Post of the Future
CUA - Commander's Update Assessment
DC1 - Domain Controller #1
DC2 - Domain Controller #2
DC2R - Digital command and Control Exercise Rehearsal
DCGS-A - Distributed Common Ground System - Army
DISA - Defense Information Security Agency
FBCB2 - Force XXI Battle Command, Brigade and Below
FFIR - Friendly Forces Information Requirements
FMC - Fully Mission Capable
FOB - Forward Operating Base
FREQS - Frequencies
FSO - Full spectrum Operations
IA - Information Assurance
ISO - In Support Of

JABBER - Internet Relay Chat Platform
JNTC-S - Joint Network Transport Capability - Spiral
LAN - Local Area Network
MDMP - Military Decision Making Process
MOS - Military Occupation Specialty
MOSS - Microsoft Office SharePoint Services
NETCOM - Network Enterprise and Technical Command
NETOPS - Network Operations
NIPR - Non-secure Internet Protocol Router
NMC - Non-Mission Capable
NTC - National Training Center
PACE - Primary, Alternate, Contingency, Emergency
PLL - Prescribed Load List
PPT - Power Point
QRF - Quick Reaction Force
QTip - Internet Vulnerability Scanning Software
RSOI - Reception, Staging, Integration, Onward Movement
RTU - Rotational Unit
RTX - Retransmission
SEP - Symantec EndPoint Protection
SICO - Signal Company
SIPR - Secure Internet Protocol Router
SNAP - SIPR/NIPR Access Point
STAFFEX - Staff Exercise
STX - Squad Tactical Exercise
SVoIP - Secure Voice over Internet Protocol
TACSAT - Tactical Satellite
TBC - Tactical Battle Command
TLP - Troop Leading Procedures
TOC - Tactical Operations Center
UAS - Unmanned Aerial System
UPS - Uninterrupted Power Supply
VTC - Video Teleconference
WAN - Wide Area Network
WIN-T - Warfighter Information Network - Tactical
WSUS - Windows System Update Servers