ABCS

Army Battle Command System Leader's Reference Guide

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The ABCS Leaders Reference Guide is provided to the digital force for use during planned Battle Staff Training and Exercises. Please utilize the guide during your training and provide comments on any technical errors or ways to improve it to:

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PREFACE

This guide summarizes key information which leaders require to exercise Command and Control (C2) using the Army Battle Command System (ABCS). Contained here is information on the components of ABCS, its supporting systems, and how to use ABCS within a Command Post (CP) to support battle planning, preparation, and execution. It is intended to supplement the ABCS Training Support Packages (TSPs) developed by TRADOC Programs Integration Office - Army Battle Command System (TPIO-ABCS) for the Interim Brigade Combat Team (IBCT), Fort Lewis, Washington.

The guide draws information from a wide range of sources. In turn, this information is presented in a simple format, maximizing the use of diagrams, tables, and illustrations wherever appropriate. The intended result is to provide a handy compendium of information on ABCS that is of practical use to the Battle Staff under training and tactical situations. Leaders seeking further explanation or detail should consult the reference material listed at References at the end of this guide.

This guide has been produced for the United States Army under the auspices of TPIO-ABCS. Every attempt has been made to ensure that this guide is consistent with current Joint doctrine and publications.

Unless otherwise stated, whenever the masculine or feminine gender is used, both men and women are included.

CHAPTER 1
INTRODUCTION TO ABCS

Overview: This chapter provides a brief overview of the background and importance of ABCS and its usefulness to the commander and staff.

"Never forget that all technology can ultimately do is give your staff more time to think. It can't think for them. Data is not information. Information is not judgment. Judgment is not wisdom. Numbers are not policy. Quantitative approaches can't solve qualitative problems."

1-1 Background

In the 1980s, Army leaders made a conscious decision to develop increasingly lethal platforms aided by automation. The utility of this decision was demonstrated during Operation Desert Storm. The Army and other services continue to enhance the lethality and force protection of the total force by developing automated C2 systems. For military operations in the 21st Century, force projection, split-based operations, information warfare, and joint or combined operations will be the rule. Crucial to these capabilities is the effective flow of information to support warfighting throughout all phases of an operation. Rapid and reliable information networks are therefore necessary to enable the Army to project the force, protect the force, gain information superiority, determine the battlespace, conduct decisive operations, and sustain the force.

1-2 Purpose

This reference guide is intended to provide commanders and their staffs with a quick reference on how ABCS helps them do their job and what critical ABCS functions they need to perform as ABCS decisionmakers and information integrators (or staff members). It is not intended to be an operator/staff officer's guide for a specific system. Quick access to updated, centralized information is essential for institutional training, New Equipment Training (NET), sustainment training and, in conjunction with operational employment of the ABCS, the use of sensors and communications systems supporting the force. ABCS assists the commander in exercising C2 of available forces to accomplish a mission. It allows him to "see and understand" his battlespace and to gain Situational Understanding (SU) on the battlefield. ABCS assists him in the art of command by allowing him to apply his judgment more productively and rapidly, to use his command presence more efficiently, to develop and disseminate his vision effectively, and to understand better and more quickly the dynamics of war (in general) and the specific operation (in particular).

1-3 Use

This guide was developed to complement the ABCS TSPs developed to support the Army Transformation digitization. It is relevant to institutional training (awareness) and unit training (individual and collective). A soldier will be provided this guide early in his digital training and should keep it for quick reference.

1-4 Battle Staff Benefits

ABCS enables leaders to exercise C2 by providing them a visual means to see friendly and enemy forces and the ability to arrange and maneuver their forces to accomplish missions. By sharing information through ABCS, commanders take the critical first step toward achieving effective C2. Collectively, the ABCS components assist in answering the following six basic questions for the commander.

- Where am I?
- What is my status?
- Where are the other friendly units?
- What is their status?
- Where is the enemy?
- What is the enemy's status?

ABCS assists in answering these questions by providing a Common Operational Picture (COP) of the battlespace. Although each Battlefield Automation System (BAS) of ABCS (discussed in detail in Chapter 2) makes contributions that support its own Battlefield Operating System (BOS)-oriented tasks, the key contribution of ABCS is as an interoperable "System of Systems." The synergistic capabilities of ABCS allow commanders to reach across the BOSs to request, select and evaluate data from diverse resources to create relevant information. The ABCS common operational picture (Chapter 7) begins with a common map background against which a commander can display a variety of information such as:

- Friendly locations and graphic control measures
- Enemy units and equipment
- Fire support control measures, range fans and targets
- Air tracks and tactical ballistic missile tracks
- Logistics status and joint information

1-5 ABCS Operational Characteristics

ABCS creates an operational picture of the battlespace through timely presentation of information in various types of formats including voice, data,

imagery, graphics, and video in order to enhance the commander's visualization of the battlespace. The operational picture also provides:

- Access to planning documents
- Status reports
- Timely, automatic warnings of air, missile and Nuclear, Biological, Chemical (NBC) attacks

The operational picture includes other Army units as well as joint, allied or coalition forces, and enemy, neutral or unknown forces. Each user has the ability to tailor his operational picture to meet his specific needs showing as little or as much information as is desired. Although it is possible for soldiers at different locations to create identical operational picture displays, that is not a primary goal of ABCS. ABCS' essential contribution to C2 is that it provides identical, shared data as the basis of any operational picture that a particular user chooses to display. Commanders command their forces using ABCS' continuous, high-quality updates of the operational picture to make effective incremental adjustments during execution. Refer to Chapter 7 for details on the COP.

ABCS enhances warfighting in the following ways:

- Accelerates the Military Decisionmaking Process (MDMP) including the preparation of estimates, Course of Action (COA) development, wargaming, and orders production and dissemination
- Assists in gathering and displaying relevant information for commanders, staffs and other leaders while filtering out unnecessary data
- Allows for dissemination of information in near real-time and minimizes latency for all information exchanges
- Facilitates the synchronization of combat, combat support and Combat Service Support (CSS) activities on the battlefield by increasing the opportunities for real-time collaboration by staffs and commanders

- Exploits digital map data and digital terrain analysis products
- Facilitates rehearsal and training through compatibility with current and future simulation and stimulation systems
- Through the COP, enables the commander to synchronize dynamic and static data elements
- Enhances interoperability through a common “look and feel” design that reflects the adoption of common procedures to execute common tasks
- Presents information in useable formats
- Provides scaleable information displays
- Reduces maintenance and support costs through the exploitation of common hardware
- Through reachback capability, ABCS gives the commander access to data in austere environments.

1-6 Common Services

Information management applications of ABCS provide:

Collaboration Tools (Video teleconference [VTC], whiteboard, shared applications, etc.):

- Messaging
- File transfers
- Calendar creation/scheduling
- Task management
- Internet browser
- Database query tools

Training applications: That provide training and simulation capabilities for individual and collective training events

Common Applications: Include word processor spreadsheet programs and presentation/graphics program. Document interchange services support document exchanges between heterogeneous computer systems using common file formats.

Operational Picture Application: Creates a shared picture of the battlespace.

Planning Application: Automates aspects of the MDMP and enables parallel and collaborative planning.

1-7 ABCS Communications Network

Connectivity is provided by tactical communications systems: Mobile Subscriber Equipment (MSE), Near Term Digital Radio (NTDR), Single Channel Ground and Airborne Radio System (SINCGARS), and Enhanced Position Location and Reporting System (EPLRS). The ABCS systems within the brigade, division, and corps CPs are supported by a wide area network (WAN)/Local Area Network (LAN) switch/router architecture.

1-8 Other Digital Systems

Additional systems interfacing with ABCS may include the Army Airborne Command and Control System (A2C2S), the Digital Topographic Support System/Quick Response Multicolor Printer (DTSS/QRMP), Common Ground Station (CGS), and DaVinci.

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CHAPTER 2
SYSTEM DESCRIPTION

Overview: This chapter describes ABCS in detail, summarizing its overall capabilities and the mission area, location, and key capabilities of each component of ABCS.

2-1 Introduction

ABCS links BAS, communications media, and operational facilities to support commanders and their staffs in collecting and analyzing information, developing plans and orders, and monitoring the tactical battlefield, while simultaneously planning future operations.

ABCS is the Army's component of the Global Command and Control System (GCCS). It is a complex system of systems that provides the mechanism to receive and transmit information among the joint forces. The systems that comprise ABCS provide the core capabilities to facilitate world-class Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) on the battlefield.

The ABCS consists of subsystems (or BASs) for the BOSs. Each BAS supports and provides information to other systems and provides SU of the battlefield. By integrating the ABCS components through the Joint Common Database (JCDB), the operational picture can be viewed at any workstation according to the commander's specific requirements. In addition, ABCS subsystems provide an array of specialized capabilities and applications for commanders of diverse units at all levels.

ABCS consists of these component systems:

- Global Command and Control System - Army (GCCS-A)
- Maneuver Control System (MCS)
- Maneuver Control System - Light (MCS-L)
- All Source Analysis System (ASAS)
- All Source Analysis System - Light (ASAS-L)
- Advanced Field Artillery Tactical Data System (AFATDS)
- Air and Missile Defense Planning and Control System (AMDPCS)
- Combat Service Support Control System (CSSCS)
- Force XXI Battle Command - Brigade and Below (FBCB2)
- Tactical Airspace Integration System (TAIS)
- Digital Topographic Support System (DTSS)
- Integrated Meteorological System (IMETS)

Five of the above components comprise a subset within ABCS called the Army Tactical Command and Control System (ATCCS). Those systems are: MCS, ASAS, AFATDS, AMDPCS, and CSSCS. As listed above, both MCS and ASAS come in "light" versions. Further details about each system are provided below.

2-2 GCCS-A

Mission Area: GCCS-A is the Army component system that directly supports Army implementation of the joint GCCS. Its mission is to support monitoring, planning, and execution of joint, combined, and Army conventional military operations, as well as operations other than war for the Army Echelons Above Corps (EAC) and components of the Commanders in Chief (CinCs). GCCS-A ensures Army access to key information within the joint realm such as force tracking, host nation and civil affairs support, theater air defense, targeting, psychological operations, C2, logistics, and medical and personnel status. In turn, this information supports corps-level planning, execution, and monitoring of mobilization, deployment, sustainment, and redeployment of Army forces (ARFOR).

Location: There is a GCCS-A system at both the corps main and tactical CPs.

Key Capabilities:

Commander's Force Analyzer

The Commander's Force Analyzer provides current Time Phased Force Deployment Data (TPFDD). This information is key for planning the movement of forces and monitoring unit status and availability.

Logistics Analyzer

The Logistics Analyzer in GCCS-A gives planners the capability to forecast the resources needed to support the force in various combat situations.

GCCS/GCCS-A Interface

GCCS-A shares the client-server architecture Common Operating Environment (COE) with the joint GCCS for the general functions of teleconferencing, messaging, file transfers, office automation, utilities, and system administration (GCCS-A, however, uses a different commercial database system).

2-3 MCS

Mission Area: MCS is the ABCS system used by the operations staff to monitor the current battle and to plan the future battle. MCS gives commanders and staffs the ability to collect, coordinate, and act on near real-time battlefield information and to display the battlefield. MCS integrates information horizontally and vertically to provide the Common Picture (CP) of friendly and enemy unit locations.

Location: MCS is found at echelons from battalion through corps.

Key Capabilities:

Message Processor

The message processor is available on all MCS workstations. It is used to create, edit, transmit, print and store messages in both U.S. Message Text Format (USMTF) and Joint Variable Message Format (JVMF).

Operations Orders and Task Organization

With word processing templates and web browser technology, MCS can rapidly produce and distribute standard five-paragraph Operations Plans (OPLANs), operations orders (OPORDs), Fragmentary Orders (FRAGOs), and Warning Orders (WARNOs). Task organizations are created, edited, and displayed using the Unit Task Organization (UTO) Tool.

Collaborative Planning

MCS collaborative planning tools enable commanders and staffs to conduct multi-node collaborative planning sessions within or between CPs. These tools include data conferencing, chat, and whiteboard. The "John Madden"-style whiteboard is a powerful capability for wargaming, orders briefs, and backbriefs. The chat feature is similar to current chat programs available on personal computers. Multiple users can communicate simultaneously by posting text messages which can be read simultaneously by all chat participants.

MCS Light

The system is also available in a light version (see next page).

2-4 MCS-L

Mission Area: MCS-L operates as a client of MCS with many of the same capabilities as listed below. MCS-L can operate on any desktop or laptop computer with a Windows NT 4.0 operating system. MCS-L is able to obtain SU data directly from the JCDB and to update the JCDB with friendly locations and battlefield geometry. The chief difference between MCS-L and MCS is the latter system's ability to perform various network server functions and to interface with FBCB2 through Embedded Battle Command (EBC).

Location: MCS-L is found at battalion and brigade echelons and in certain separate companies.

Key Capabilities:

Orders Products

Can produce orders, plans, and annexes. Used to develop task organizations, overlays, and synchronization matrices.

Analytical Tools

Can be used to develop and assess courses of action. Includes Distance/Rate Tool.

Reporting

Has messaging capability and report generator. Used to maintain the staff journal.

Key Information

Used to record/depict Named Areas of Interest (NAIs), Target Areas Of Interest (TAIs), Essential Elements of Friendly Information (EEFI), Commander's Critical Information Requirements (CCIR), Priority Intelligence Requirements (PIRs), High Value Targets (HVTs), and High Payoff Targets (HPTs).

Utilities

Can function as File Transfer Protocol (FTP) client/server. Possesses Adobe Acrobat, a file zip utility, MS Office, and a web browser.

2-5 ASAS

Mission Area: ASAS is the ABCS intelligence fusion system used by intelligence staff. ASAS receives and processes large amounts of intelligence and information from sensors, processors, and communications systems at national, theater, and tactical echelons to include spot reports from FBCB2. It provides a timely, accurate, and relevant picture of the *enemy situation*. The intelligence officer can use his ASAS Remote Workstation (RWS) for automated situation development, COAs, targeting, tactical warning, and Battle Damage Assessment (BDA).

Location: ASAS can be found at echelons from battalion to corps. An ASAS RWS can function as a stand-alone system or as an adjunct to an Analysis and Control Element (ACE) at corps and division level and the Analysis and Control Team (ACT) at brigade.

Key Capabilities:

Intelligence Preparation of the Battlefield (IPB)

Intelligence personnel can use the analysis tools in the ASAS RWS for their IPB. For example, it is able to depict tracked vehicle GO and NO GO areas overlaid on a terrain map.

COA Analysis

The ASAS RWS assists the warfighter's COA analysis with information on enemy units, equipment, locations, and movements.

Targeting and Alerts

Using reports and sensor inputs, the RWS can alert the operator to enemy targets and can automatically nominate them for friendly supporting fires. Commanders and staff can even focus ASAS on the specific types of targets that will best support the mission.

Enemy Situation Monitoring

ASAS also monitors the current enemy situation. Using the latest combat information and intelligence, it maintains and displays timely, detailed data on enemy units.

ASAS - Light

The system is also available in a light version (see below).

2-6 ASAS-L

Mission Area: ASAS - Light provides a Windows NT intelligence processing capability on a laptop computer and has vertical and horizontal interoperability with MCS, AFATDS, FBCB2, and other ASAS systems. It is intended primarily for those who use preprocessed intelligence information and graphic IPB products received from the ACT, ACE, and the S2's ASAS RWS (the chief ASAS platform at corps, division, and maneuver brigade echelons). ASAS - Light receives and processes initial intelligence reports and information received via FBCB2 to maintain SU. ASAS -

Light will also forward these reports to the ACT and ACE where the information will undergo intelligence processing and integration before returning to the brigade intelligence officer as fully correlated intelligence information.

Location: ASAS-L is found at the battalion echelon.

Key Capabilities:
Intelligence, Surveillance, and Reconnaissance (ISR)
Provides ISR management and analytic support to the battalion intelligence officer for SU, tactical warning, force protection, and targeting.

Nexus for Battalion-Level ISR Operations
Processes input data from battalion ISR systems and sources. Provides analyzed red picture to the operational picture.

2-7 AFATDS

Mission Area: Employed by artillery operations staff, AFATDS provides for fully automated fire support planning, coordination, and control of close support, counterfire, interdiction, suppression of enemy air defenses, and deep operations. AFATDS matches fire support weapons with targets based on target type, commander's guidance, unit availability, weapon status, and ammunition availability. It encompasses fire support platforms across the services, including mortars, field artillery cannons, rockets, close air support, attack helicopters, and naval gunfire. AFATDS is a multi-service system, being also employed by the United States Marine Corps.

Location: AFATDS is positioned from the firing battery through EAC.

Key Capabilities:

Weapon-Target Pairing

AFATDS analyzes a potential target and then identifies which available fire support systems would be most effective. This information is shown to the operator through a visual display.

Engagement Guidance

Based on the commander's guidance, the Target Management Matrix in AFATDS prioritizes targets and supported units, specifying the method of engagement and the volume of fire for each type of target. These priorities can vary according to varying guidance for each phase of an operation in order to best support the commander's intent and scheme of maneuver.

Fire Missions

AFATDS processes fire missions through combat messages in dialogue with MCS, CSSCS, AMDPCS, and FBCB2 and reports mission results to ASAS.

Fire Support Planning

In addition to managing the fire support of current operations, AFATDS assists fire support planning for future operations. Its planning mode offers decision aids and analytical tools to determine which fire support plan best supports a course of action.

2-8 AMDPCS

Mission Area: AMDPCS is the air defense staff's BAS that provides the commander with the tools required to monitor current air operation while planning for future events. It also provides SU of the third dimension. The Force Operations (FO) capability of AMDPCS supports the planning, coordination, preparation for, and sustainment of the air defense mission. It integrates air defense fire units, sensors, and C2 centers into a coherent system for defeating the aerial threat. Defense planning and analysis functions support the development of Air Defense Artillery (ADA) missions and the distribution and merging of missions between echelons. AMDPCS also supports Air Battle Management by displays which show Airspace Control Orders (ACOs), current fire unit status, alert posture, missile expenditure, and personnel ready for duty.

Location: AMDPCS is located at the ADA battery CP with the maneuver brigade main CP, the division CPs, corps CPs, and at EAC.

Key Capabilities:

Air Defense Unit Status

The unit status screen shows the location, alert status, on-hand munitions, vehicles, and personnel for ADA units from section through battalion echelon.

Weapon and Sensor Visibility

AMDPCS also supports placement of ADA weapons and sensors. By analyzing platform capabilities and digitized terrain elevation data, AMDPCS can determine the area coverage of weapons and sensors at different locations.

Mission Planner

The AMDPCS mission planner shows zones of sensor coverage, weapons coverage, friendly and hostile air tracks, air avenues of approach, and airfields. The commander can use this display to synchronize air defense coverage with the planned scheme of maneuver. Operators can set parameters to depict aircraft at various altitudes based on the surrounding terrain.

2-9 CSSCS

Mission Area: CSSCS is the logistician's battlefield decision support and SU system for planning and controlling the logistics support of combat operations. Warfighters can logistically assess future COAs using current or planned task organizations and approved planning factors. CSSCS can track the resource status throughout the task organization down to company level.

Location: CSSCS terminals are found from the battalion through corps.

Key Capabilities: Logistical Status Reports

Logistical reports show unit and resource status. This status is depicted with a color code of green, amber, red, or black using corresponding percentages set by the user. These reports can be displayed as web-based custom reports or as standard, pre-formatted reports. The *standard* report shows the logistical readiness of a unit and its subordinate units. The user can focus on parts of the report to isolate specific units and materiel items. This capability can help identify how an individual status affects the overall readiness rating of the unit. In the *custom* report, the CSSCS user can track the status of specific units and resources.

Capability Report

The Capability Report shows a unit's logistical ability to conduct sustained combat operations. This report provides unit resource status in relation to combat posture and intensity for the current day and next four days.

Supply Class Report

The Supply Class Report shows resource status with items grouped by class of supply.

Personnel Daily Summary

The CSSCS Personnel Daily Summary (PDS) depicts unit personnel status and is available for all company-size units and separate battalions.

2-10 FBCB2

Mission Area: FBCB2 provides C2 and SU to the lowest tactical echelons. FBCB2 supports operational control chiefly through the transmission and receipt of orders, reports, and data via combat messages. FBCB2 employs a position navigation and reporting capability to depict and transmit the unit's own location. FBCB2 can also access other friendly units' locations as well as intelligence to show the friendly and enemy picture in near real-time and even while on the move. In its precursor version, FBCB2 is called "Applique."

Location: FBCB2 is found throughout the battlefield from commander to platform and even soldier level.

Key Capabilities:

Situational Understanding

FBCB2 assists SU by telling the user his location as well as the location of other friendly forces, observed enemy forces, and reported battlefield obstacle locations. The user can adjust his picture of the battlefield by selecting which overlays, graphics, and icons are shown. Unit displays can be altered by grouping icons according to unit type or echelon.

Combat Messages

FBCB2 also automates frequently used urgent messages for reporting the enemy, requesting medical evacuation, NBC attack, call for fire, cease fire, and unit situation reporting. Enemy information can be rapidly formatted via an automated report. In turn, this information is forwarded to all other FBCB2 users as well as the ASAS system supporting the user, usually the task force or brigade S2. FBCB2 supports the call for fire process via a message in JVMF sent directly to AFATDS. The integration of the laser ranger finder with FBCB2's Ground Positioning System greatly improves the speed and accuracy of both calls for fire and enemy spot reports.

Logistical Reporting

FBCB2 provides key information input to CSSCS on unit logistical status.

2-11 TAIS

Mission Area:

TAIS is a digitized, integrated battlefield management and decision support system to assist the ground commander's role in the air battle. TAIS supports warfighters by

automating Army Airspace Command and Control (A2C2) planning and operations and Air Traffic Services. TAIS also helps planners build Army input for the joint ACO to distribute the approved A2C2 overlay. TAIS can display Airspace Control Measures (ACMs) in two or three dimensions while monitoring the real-time airspace situation. TAIS provides SU of the third dimension by providing real-time airspace information that displays the location and movement of aircraft transiting the battlespace overlaid against current ACMs.

Location: A TAIS system is found at the Division Main (command post) (DMAIN) to support A2C2 planning. A second TAIS will be located within the division area where it can optimally provide flight following functionality. At corps level, one TAIS will be found at the main CP while a second will be placed consistent with the tactical situation. TAIS is also found at EAC.

Airspace Deconfliction

TAIS is able in real-time to deconflict (mathematically and graphically) airspace usage in the third and fourth dimensions (i.e., altitude and time). For example, the operator can graphically rotate a three-dimensional representation of the airspace to see ACMs from different angles, enabling him to see how they intersect and overlap.

Air Traffic Services

The Air Traffic Services display includes information from the ACO and Air Tasking Order (ATO). TAIS operators can use this display to track the flight of aircraft. If an aircraft leaves the safe transition corridor, TAIS will alert the operator.

Communications

TAIS shall be able to communicate (voice and data) with current and future military aircraft (joint/combined), civilian aircraft and air traffic control systems, and other US and allied forces airspace users.

2-12 DTSS

Mission Area: DTSS enables topographic support personnel to receive, format/reformat, store, retrieve, create, update and manipulate digital topographic data. DTSS gives the warfighter digital terrain analysis, terrain databases, updated terrain products, and hard copy reproduction of topographic products to include maps. Its tactical decision aids support COA analysis and the decisionmaking process. These aids include mobility analysis, intervisibility analysis for determining line of sight, environmental and climatology analysis, terrain elevation, and other special products. Using the Global Broadcast Service (GBS), DTSS receives and distributes digital terrain data from the National Imagery and Mapping Agency (NIMA). DTSS can update existing digital maps from satellite imagery and produce full size, color paper maps from any DTSS product.

Location: DTSS is found at the corps main CP, DMAIN and tactical CPs, and brigade CPs.

Key Capabilities:

Mobility Analysis

DTSS is able to produce sophisticated mobility analysis products. For example, it can provide a detailed analysis comparing off-road mobility of the High Mobility Multipurpose Wheeled Vehicle (HMMWV) and the Abrams Tank.

Intervisibility Analysis

DTSS can perform intervisibility analysis, which is overlaid on a terrain map backdrop. For example, from any point on the map, it can depict every other point within line of sight of that first point.

Three-Dimensional View

DTSS can also depict a three-dimensional view such as a "fly-through" area. Colored areas show threat and friendly air defense domes superimposed on satellite imagery. The DTSS database contains detailed terrain information, but not weapon characteristics and locations; these must be obtained from the intelligence staff.

2-13 IMETS

Mission Area: IMETS is the meteorological component of ABCS. It gives intelligence staffs and commanders an automated, high-resolution weather system to receive, process, and disseminate current weather observations, forecasts, and weather and environmental effects decision aids.

Location: IMETS workstations manned by staff weather teams can be found at the aviation brigade main CP and the division and corps main CPs.

Key Capabilities:

Weather Data Integration

IMETS receives weather information from polar-orbiting civilian and military meteorological satellites, the Air Force Global Weather Center, artillery meteorological teams, remote sensors, and civilian forecast centers.

Weather Products

IMETS processes and collates forecasts, observations, and climatological data to produce timely and accurate weather products tailored to the warfighter's specific needs

Web Page

Additional weather information is available via the IMETS web pages.

Weather Warnings

Severe weather warnings are disseminated to units via USMTF message.

IWEDA

The Integrated Weather Effects Decision Aid (IWEDA) displays weather effects on weapon systems or missions. The IWEDA client is available to all BASs. For example, it can show the various weather effects, whether favorable, marginal, or unfavorable on various weapons over the next twenty-four hours.

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CHAPTER 3
NETWORK ARCHITECTURE AND TACTICAL INTERNET

Overview: This chapter describes the communications architecture and equipment that support ABCS, describes bandwidth limitations, and offers guidelines on how to reduce the effects of these limitations.

ABCS computers work together over a communications network called the Tactical Internet (TI). ABCS employs a mix of fixed/semi-fixed installations and mobile networks and is interoperable with theater, joint, and combined C2 systems.

3-1 Definitions

- ***Network:*** A group of computers or information systems that are electronically interconnected which can transfer information to one another and can work together.
- ***Connectivity:*** The linking together of systems or nodes that pass information interchangeably for the establishment of a network.
- ***Internet:*** An interconnection of networks.
- ***Architecture:*** The design principles, physical configuration, functional organization, operational procedures, and data formats used for the design, construction, modification, and operation of a communications network.

- ***Interface:*** A point of communication between two or more processes, persons, or other physical entities. A point of interconnection between user terminal equipment and commercial communications facilities. To interconnect two or more entities at a common point or shared boundary.
- ***Local Area Network (LAN):*** A network within a limited spatial area used by a specific group of operators. LANs are usually restricted to relatively small areas, such as rooms, buildings, CPs, ships, and aircraft.
- ***Wide Area Network (WAN):*** A network that serves a larger number of independent users than are usually served by a LAN. A WAN is typically composed of at least two LANs spread over a large geographic area. WANs may be nationwide or even worldwide.
- ***Server:*** A network device (such as a BAS) that provides service to the network users by managing shared resources.
- ***Bandwidth:*** The available transfer data rate of information over a specific electronic connection within a network. Sometimes informally referred to as "pipe size."
- ***Information Dissemination Management (IDM):*** Essentially, it means getting the right information to the right place at the right time. It is the awareness, access, and delivery of information. Involves the compilation, cataloging, caching, distribution, and retrieval of data.

3-2 Tactical Internet Overview

The TI is comprised of tactical communications systems linked with routers using commercial addressing and routing protocols that allow digital systems to Send and Receive (SR) SU and C2 data. Integrated System Control (ISYSCON) provides overall network management. The TI must deliver messages reliably, despite mobility of units, battle stress, obscuring terrain, enemy interference, destruction of CPs, loss of key elements and replacement of individual platforms.

The TI is supported by the communications systems as shown at Table 3-1 and as depicted at Figure 3-1.

System	Echelon(s) Where Found
Enhanced Position Location Reporting System (EPLRS) Single Channel Ground and Airborne Radio System (SINCGARS)	Platforms at Platoon thru Brigade
Near Term Data Radio (NTDR)	Battalion thru Brigade
Mobile Subscriber Equipment/Tactical Packet Network (MSE/TPN) Brigade Subscriber Node (BSN) High Capacity Line of Sight (HCLOS) Radio	Brigade thru Corps
SPITFIRE	Battalion thru Division
SCAMP	Brigade thru Division
SMART-T	Division thru Corps

Table 3-1. Communications Systems Supporting the Tactical Internet

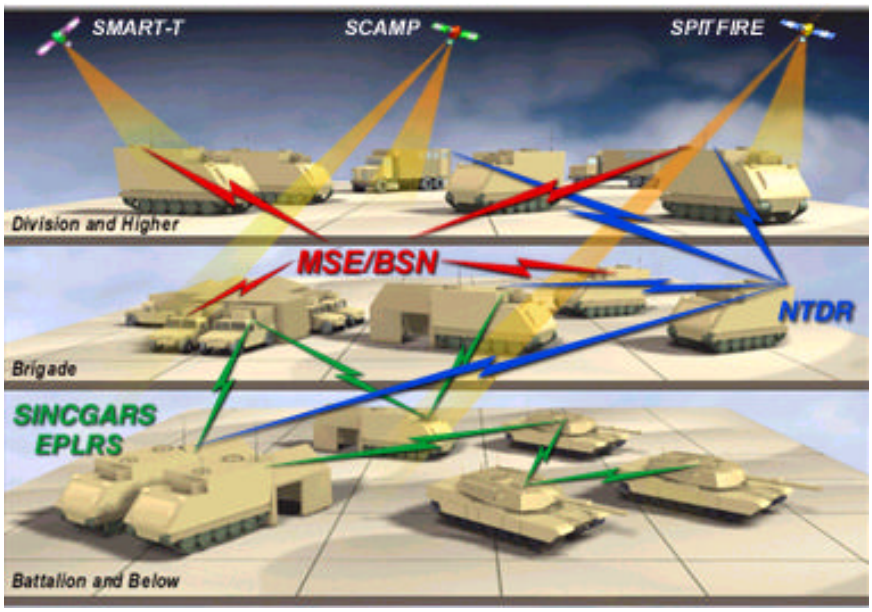


Figure 3-1. Tactical Internet

3-3 FBCB2 Networks

The first BAS that most soldiers will encounter is FBCB2. This BAS is found on platforms at company level and on key platforms at battalion and brigade echelons. FBCB2 uses EPLRS and SINCGARS Advanced System Improvement Program (ASIP) radios to transmit data over the TI. EPLRS is the backbone of the company TI. However, not all platforms are equipped with EPLRS. While EPLRS is currently found on platoon leader and platoon sergeant platforms in combat arms platoons, the Army's objective is to eventually field EPLRS to all combat platforms. Other types of units (e.g., a truck platoon), however, may only have the platoon leader's vehicle equipped with EPLRS. The other platforms in the company transmit FBCB2 data through the SINCGARS ASIP radio to the

EPLRS radios in the company. Figure 3-2 depicts the network supporting FBCB2 with EPLRS in only unit leaders' combat platforms.

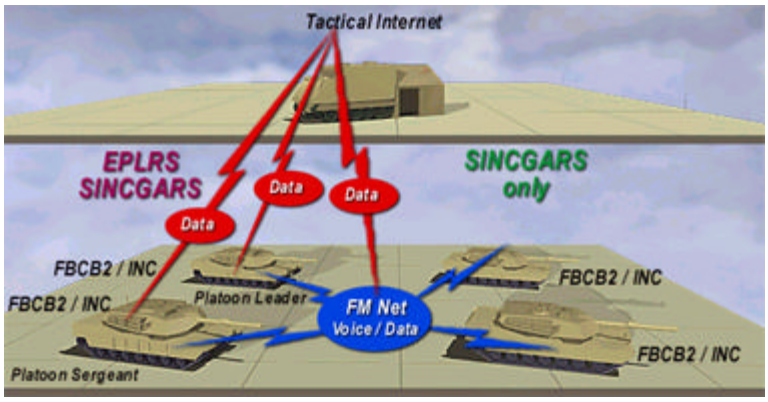


Figure 3-2. FBCB2 Network

3-4 CP/FBCB2 Connectivity

Battalions will use FBCB2 to communicate with lower echelons. The FBCB2 information will be transmitted using the Integrated Network Controller (INC) over EPLRS or SINCGARS radios. FBCB2 is represented in the CP by EBC which resides on the network server. EBC allows FBCB2 to exchange certain information with the other ABCS systems. This exchanged information consists of friendly position locations (to support the friendly or “blue” picture portion of the CTP) and messages that are displayed graphically. Data is passed from FBCB2 to the CP server via external communications.

Large data files cannot be transmitted over the EPLRS-supported network due to narrow bandwidth. This mandates the use of short, burst-like data transmissions using JVMF and Variable Message Format (VMF) messages. Routers at the EBC points of interface keep large amounts of data from entering and clogging the narrow-bandwidth radios used by FBCB2. This is discussed in greater detail at

paragraph 3-6 below. The interface between CP LANs and FBCB2 is shown at Figure 3-3.

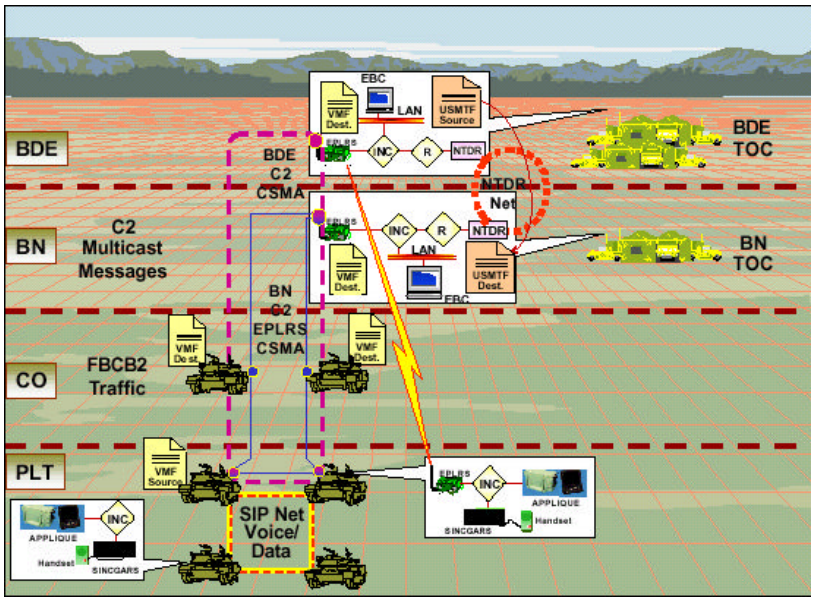


Figure 3-3. Interface Between CPs and FBCB2

3-5 CP LANs and WANs

Within a CP, ABCS workstations are physically linked on high speed LANs. One ABCS system within the LAN—usually MCS or ASAS—also functions as the LAN server. The CP server stores SU data for the JCDB and performs network management functions (see Chapter 4 for further discussion about the JCDB). The server controls the flow of information inside the LAN from the different BAS systems and to other external LANs. Figure 3-4 depicts a typical CP LAN using MCS in its common role as CP server. The figure also depicts the interface between FBCB2 and the CP via EBC residing on the server.

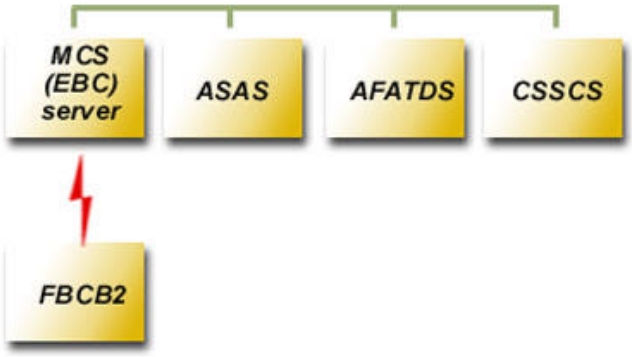


Figure 3-4. Typical TOC LAN

CP LANs are linked via external communications with other CPs over a WAN. The INC and high-speed routers and switches link the elements of the WAN into a seamless data transfer system. Figure 3-5 shows a typical distribution of BASs among CPs in a brigade. (There are no ABCS LANs below the battalion echelon.) Also shown is the communications connectivity between battalion and the brigade CPs provided by the NTDR.

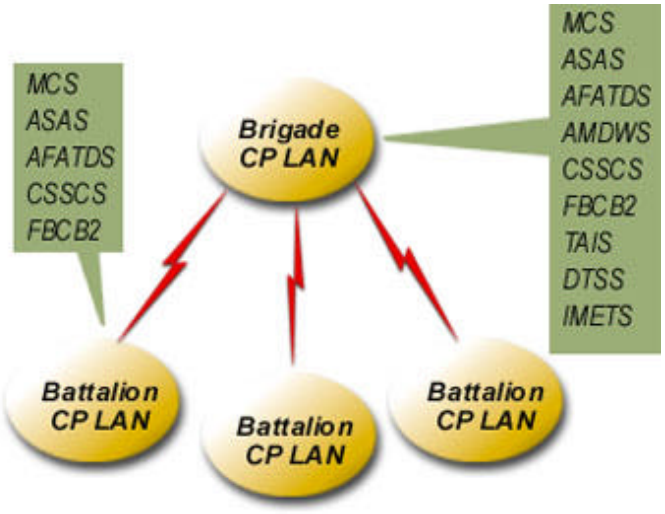


Figure 3-5. BAS, LAN, and WAN Relationship

The type of external communications connecting Tactical Operations Center (TOC) LANs depends on the echelon. NTDR is the main communications system connecting battalion and brigade CPs. MSE (enhanced by Asynchronous Transfer Mode [ATM]) and BSN provide the main connectivity among brigade, division, and corps CPs. The division connection to the TI is normally established via a router that is an integral part of the MSE Small Extension Node (SEN) or Large Extension Node (LEN). SATCOM (such as SMART-T) and HCLOS radio may be needed to enhance the range and capacity of MSE. Military Strategic and Tactical Relay (MILSTAR) SATCOM systems are also used for communications between division and brigade. For communications between division and battalion, the battalion must be augmented with MILSTAR assets (LST 5's) for Beyond Line-of-Sight (BLOS) range extension. The GBS provides a large capacity digital pipeline for one-way broadcast from the Theater Injection Point (TIP), or from national/strategic sources to GBS receive suites throughout the division. This part of the TI is shown at Figure 3-6.

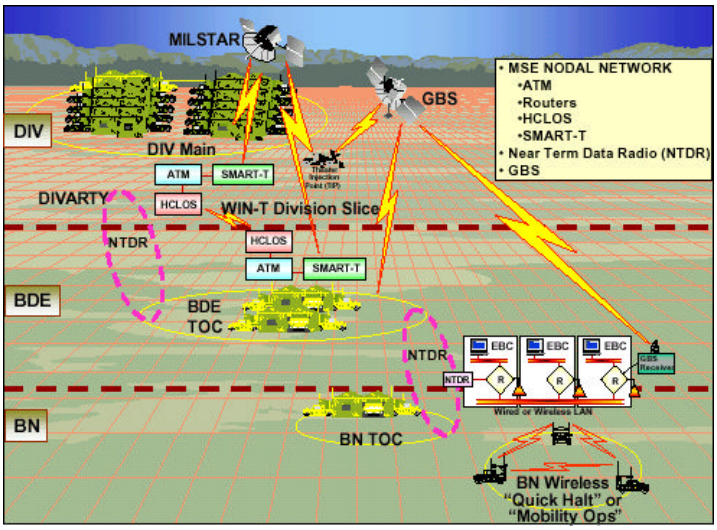


Figure 3-6. WAN Architecture from Battalion to Division Echelon

3-6 Information Dissemination Management (IDM)

Bandwidth

It is absolutely critical for warfighters to know the bandwidth of their communications systems, its effect on their ability to use ABCS, and how to manage it. Each communications system comprising the TI has a specific bandwidth. Bandwidth is the rate at which data that can be transmitted over a communications device. Think of bandwidth as a pipe carrying data within a CP LAN, between CP LANs, or between a LAN and FBCB2. If the pipe is narrow, the less the amount of data that can flow between the ABCS BASs. If a BAS sends more data than the communications systems can readily transmit or receive, the performance of the BAS will be degraded. This degradation could result in a

BAS taking a very long time to send or receive data or even the blocking of data transfer altogether.

Bandwidth is measured by the amount of data (or “bytes”) per second that can be transmitted by a communications device. Data transfer rates are typically expressed in terms of the units of measure shown at Table 3-2.

Data Transfer Rate	# Bytes	Abbreviation
kilobytes per second	1,024	kbps
megabytes per second	1,048,576	mbps
gigabytes per second	1,073,741,824	gbps

Table 3-2. Measures of Bandwidth

At brigade and above, systems supporting the TI are less mobile but offer greater bandwidth. Battalions and below rely on systems that allow them to be highly mobile but offer limited bandwidth. This limits these same units' ability to transmit ABCS information vertically and horizontally. Table 3-3 lists the communications systems found within the TI. These are grouped as follows: systems supporting FBCB2 connectivity, systems supporting WAN connectivity, and SATCOM. The bandwidth of all these systems is expressed in kilobytes per second for comparison purposes. Within each group, systems are listed in order according to increasing bandwidth. The slowest systems supporting FBCB2 and CP connectivity each form a baseline for comparing systems within these two groups; this is expressed by how much faster other systems are compared to this slowest system within a group (see right hand column labeled "X Faster). The differing amount of time each system needs to transfer files of varying size is also shown.

Equipment (and Data Rate)	Echelon	kbps	File Size					X Faster
			100 K	1 MB	5 MB	10 MB	1 GB	
Communications Systems Supporting FBCB2 Connectivity								
EPLRS	Platoon through Company	.2	9.3 min	92.6 min	7.7 hr	15.4 hr	64.3 day	B/L
EPLRS VHSIC		.4	4.8 min	47.6 min	4.0 hr	7.9 hr	33.1 day	1.9
SINCGARS ASIP	Team through Squad	1.6	1.0 min	10.4 min	52.1 min	1.7 hr	7.2 day	8.9
Communications Systems Supporting CP Connectivity								
NTDR	Battalion through Brigade	3.0	33.3 min	5.7 min	28.4 min	56.9 min	4 day	B/L
MSE THSDN NC to SEN/NC	Brigade through Corps	51.2	2.0 sec	19.5 sec	1.6 min	3.3 min	5.4 hr	17.1
MSE ATM NC to NC w/FEC		180	.6 sec	5.6 sec	27.8 min	55.6 min	1.5 hr	60
MSE ATM NC to NC w/FEC		700	.14 sec	1.4 sec	7.1 sec	14.3 sec	23.8 min	233.3
BSN	Brigade through Corps	1,024	.1 sec	1 sec	5 sec	10 sec	17.1 min	341.3
SMART-T	Division through Corps	1,024	.1 sec	1 sec	5 sec	10 sec	11.4 min	341.3
HCLOS (Band I)	Brigade through Corps	2,097	.05 sec	.48 sec	2.4 sec	4.9 sec	8.3 min	699
HCLOS (Band III)		8338.6	.01 sec	.12 sec	.61 sec	1.2 sec	2.1 min	2779.5
SATCOM Systems								
SCAMP	Brigade through Division	2.4	41.7 sec	7.1 min	35.6 min	1.2 hr	5.1 day	N/A
Spitfire	Battalion through Division	16	6.3 sec	64 sec	5.3 min	10.7 min	18.2 hr	

Time

Bandwidth ***Comparative Speed***

Key: B/L = baseline. kbps = kilobytes per second.
Note: Table reflects type-brigade network capacity with nominal load.

Table 3-3. Bandwidth Comparisons Among TI Communication Systems

Figure 3-7 further illustrates the impact of differences in bandwidth between echelons.

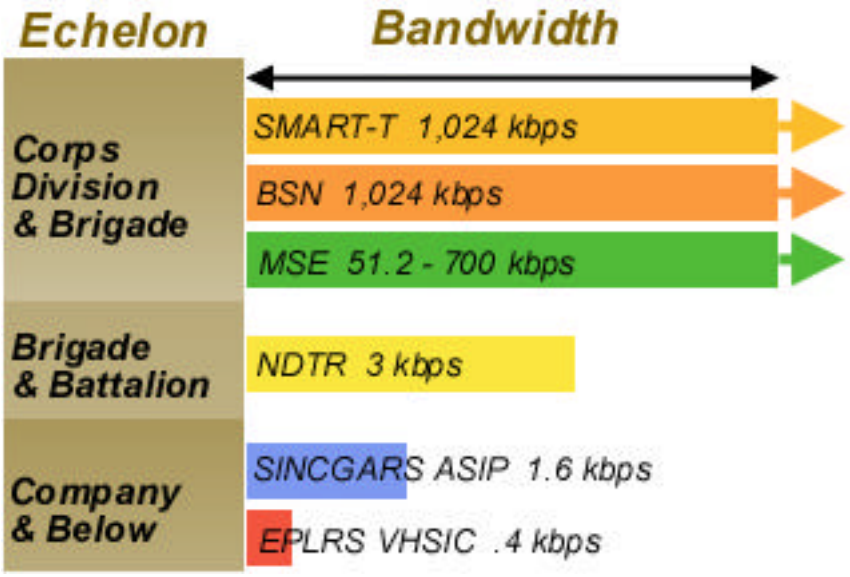


Figure 3-7. Echelons and Bandwidth Availability

Note the shortfall in bandwidth between brigade and battalion which are interconnected by the NTDR. Large data files that a brigade receives from a higher echelon over wide bandwidth systems may not, in turn, readily pass through the narrow pipe connecting the brigade to the battalion.

While battalion and brigade CPs can exchange appreciable amounts of data over NTDR, the "pipe size" provided by EPLRS and SINCGARS is much smaller between a battalion and its companies (and all leaders using FBCB2). This limits the size of the data files which can be transmitted from battalion-level BASs to

FBCB2 systems. In turn, this means that data received over NTDR may not readily pass from the battalion to FBCB2 users. For example, if a battalion attempts to forward to its companies a large graphics overlay it received from brigade over NTDR in a single file, the EPLRS/SINCGARS network may become clogged or blocked altogether.

Figure 3-8 depicts this information flow. This discrepancy in bandwidth creates a critical interface in communications at the battalion-level echelon. These bandwidth limitations require leaders and staff to carefully manage the flow of data. Routers collocated with EBC help by filtering ABCS data to keep EPLRS and SINCGARS from being flooded with information from higher.

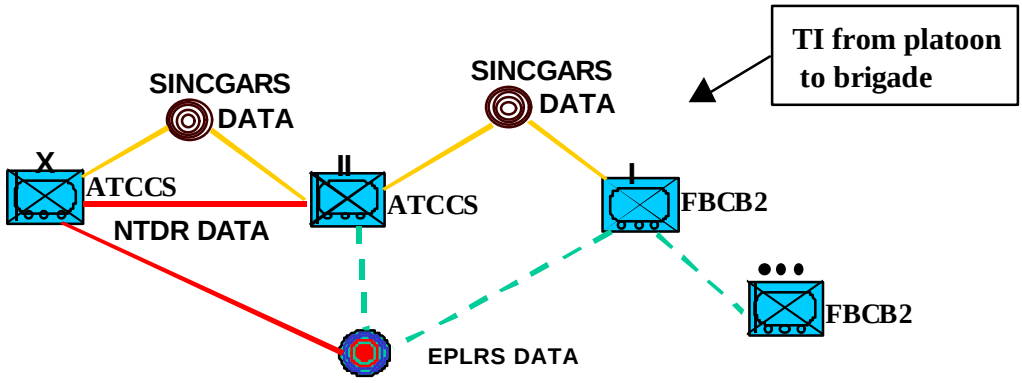


Figure 3-8. Data Exchange Interface at Battalion Echelon

Figure 3-9 illustrates these differences in "pipe-size" where the battalion and company interface and within the company itself. As the figure shows, SINCGARS SIP is able to transmit data more quickly than EPLRS/EPLRS VHSIC. FBCB2 users must therefore understand the impact of this difference within the company. EPLRS will take longer to both send and transmit data and

is more prone to being overwhelmed by extensive data transfers from higher echelons. For example, with a tank platoon, a tank commander may start to act on information that his wingman has not yet even received.

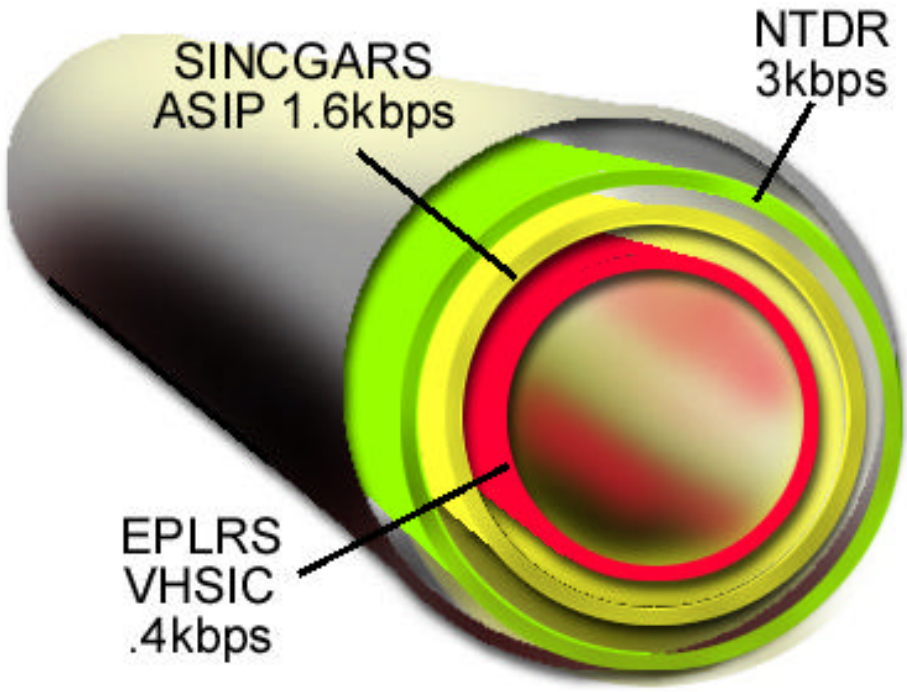


Figure 3-9. Relative "Pipe Size" at Battalion CP/FBCB2 Interface

For messages and other data to flow smoothly, personnel at every echelon must ensure data file sizes fit the pipes of the communications devices being used by subordinate echelons. Even the greater bandwidth at higher echelons can be taxed if heavy demands are placed upon it.

In general, the limitations imposed by bandwidth will allow echelons to employ the functionality as shown at Table 3-4.

Supported Echelon	Readily Supported Functions
Brigade & above (CP to CP)	C2 messaging, web pages, file sharing, collaborative planning, Video Teleconference (VTC)
Battalion (CP to CP)	C2 messaging, web pages, file sharing
FBCB2 (to other FBCB2 users or CP hosts)	C2 messaging

Table 3-4. Functions Supported Within Bandwidth Limitations

Based on the echelon and communication equipment available, the commander must therefore prioritize what information feeds he requires and when he wants them. The unit must have Standard Operating Procedures (SOPs) which identify the critical information needed to assist in network development. (See also the IBCT Training Support Packages, specifically, Volume III: Staff Section TSP > ARFOR > Module 3: C2 > Section 1 - The Art > 3C Collaborative Tools > Lesson Slides.)

Bandwidth and Collaborative Sessions

Collaboration tools are an especially key consideration as they require large amounts of data to be exchanged between users. This means that collaborative sessions may severely tax the bandwidth of certain communications devices over which ABCS transmits. Each collaborative session uses precious bandwidth that is shared by many different systems and sections. If bandwidth is consumed to

support such sessions, less bandwidth will be available to perform other tasks that may be even more critical.

Commanders must be selective as to when they employ collaborative sessions and for how long. Operators and other staff personnel cannot be permitted to use collaboration tools (such as chat conversations) without controls. Unit SOPs and other command guidance should establish firm guidelines, positive control, and clear priorities on the use of collaborative sessions.

Bandwidth Optimization

Sufficient bandwidth should be available to support necessary staff interaction at all levels if leaders take proactive measures. Commanders and staff should therefore consider the following measures to optimize bandwidth.

- Commanders should establish clear guidance as to when information is sent throughout the network; particular attention should be paid to critical phases of an operation.
- Closely involve the S-6 in all phases of the MDMP to ensure support for IDM priorities.
- Involve the S-6 in bandwidth and CP management.
- Send messages and data only to recipients who truly require the information.
- Forward emails with long histories or many attachments only when necessary.
- Allow users to download documents from an FTP site, server, or website (a "pull system") rather than sending documents directly to many recipients (a "push" system).
- Use FTP rather than email when sending large files.
- Use zip files or convert to Acrobat documents rather than transmitting common application files (e.g., MS Word, Excel, PowerPoint).

- Transmit text via USMTF or JVMF whenever appropriate.
- If several senders must reply to the same recipient, consider suspensing their responses at different times; this will prevent a large number of messages from being downloaded at the same time.
- Anticipate periods when network activity is lowest and establish report suspenses in such periods; avoid suspensing reports in high usage periods.
- Transmit graphics, imagery, and briefing slides only when essential; if text will suffice, use it instead.
- Update information particularly imagery (e.g., maps), only as often as is demanded by the tactical situation.
- Use smaller color palettes (such as 256 colors) to create graphics.
- Minimize or eliminate animation; when using animation, use mpeg, Quicktime, and avi formats in order of priority (e.g., use mpeg over avi).
- Consider sending a graphic in sections rather than as a single large image.
- Transmit a graphic in the following priority of formats: gif, jpeg, or bmp/tif (if higher clarity of image is necessary, reverse this priority).
- Scanned documents should be transmitted only if absolutely necessary; when necessary, first save them as pdf documents to transmit.
- The size of an MCS overlay has a direct impact on the reliability of its transmission to FBCB2. To improve transmission reliability:
    - Keep overlays small and simple to increase their chance of a successful transmission.
    - Keep overlay size to 20 objects or less if distributed to multiple FBCB2 addressees.

    - For a larger size overlay, consider sending it directly to one FBCB2 box (i.e., point to point) and configure the receiving FBCB2 bin to send it to multiple FBCB2 addressees.
- To minimize FBCB2 PMM crashes, consider the following:
    - When possible, send all messages Acknowledged Multicast. This means keeping the message size to less than 576 bytes if possible. A Free Text Message (FTM) can be approximately 11 lines and stay under the 576 byte limit. The size of an Overlay Message can be calculated on the Overlay Creation Tab, using the "Calculate" button.
    - If a large message must be sent, addressing it to only one recipient will cause it to be sent Unicast. Unicast is a reliable delivery protocol although it uses more communications resources.
    - If a large message must be sent to multiple recipients, keep the recipients to a minimum.
- If possible, send wav files (i.e., sound files) in basic 8- or 11-bit mono format.
- When defining the COP, display the minimum essential icons by careful use of filters.
- Update the COP using the longest possible time interval appropriate to the Operations Tempo (OPTEMPO) and tactical situation.
- Whenever possible, VTCs should be conducted via high-speed large bandwidth data transport; otherwise; quality is severely degraded.
- Do not use web pages with a lot of complexity or illustrations.
- Enforce net discipline; users must remember that the TI is for combat operations and not for personal/non-mission-related communications.
- Establish unit SOPs that economize bandwidth usage.
- Be brief.

3-7 Communications Systems Supporting the Tactical Internet

Communications Systems Supporting FBCB2

Enhanced Position Location Reporting System (EPLRS)

- EPLRS consists of a digital radio and a NetControl System (NCS) which establishes and controls the network of individual radios
- Provides secure, electronic warfare resistant data communications primarily in support of ABCS
- Is a key means of SU and C2 digital messaging at brigade and below, providing robust, on-the-move, high-speed, automated data exchange for FBCB2 over the TI
- Performs two major functions: data distribution and near real-time position location and reporting in support of friendly ('blue") SU
- Serves as the Army's primary system for the transmission of near real-time data on the battlefield including position location information
- Supports battlefield visibility and synchronization by computing and reporting position location, navigation aids, and friendly identification
- Provides near real-time data communication support to weapon system sensors and other BASs
- Key features are speed of service, throughput requirements for priority data users, and reliable data communications

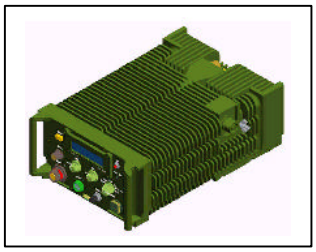
Single Channel Ground and Airborne Radio System (SINCGARS)

- Primary Combat Net Radio (CNR) for the Army, designed mainly for voice C2 for infantry, armor, and field artillery units
- High-frequency, frequency modulation VHF-FM radio system for voice and data transmission

- Enables secure communications by transmitting tactical voice and data using communications security and frequency hopping techniques
- Can operate in a single channel (single frequency) mode for interoperability with older radios
- With the INC, SINCGARS provides a digital communications link for the TI
- SINCGARS System Improvement Program (SIP) has been used with the TI to support Army digitization of the battlefield
- The SINCGARS SIP is the same physical size as the previous version, but incorporates forward error correction, higher data rates, packet technology, and the Internet Controller
- Second major modification to SINCGARS is the ASIP
- SINCGARS ASIP is a new manpack radio adapted from the SINCGARS airborne radio, incorporating programmable digital signal processing technology
- SINCGARS ASIP is also significantly smaller and lighter than the previous version, has improved reliability, and extends battery life by incorporating low power technology

Communications Systems Linking Battalion and Brigade CPs

Near Term Data Radio (NTDR)



- A networked data radio that transmits C2 and SU information/data between end users
- Provides CP-to-CP communications data backbone for digitized units
- Provides primary wide-band waveform communications network for data distribution among battalion and brigade CPs
- An interim system, this non-developmental item fulfills near-term requirements for a higher capacity data network between critical nodes within the TI
- Helps support the MSE/TPN and EPLRS data networks
- Reports its own position location
- Can operate on-the-move in all terrain and foliage
- Interface allows seamless links with SINCGARS data, MSE/TPN, and EPLRS data nets
- Is capable of internal management and automatic routing and re-routing of transmission links

SPITFIRE (also at division echelon)

- Satellite Communications/Line-Of-Sight (SATCOM/LOS) ultra-high frequency satellite terminal
- Includes embedded Communications Security

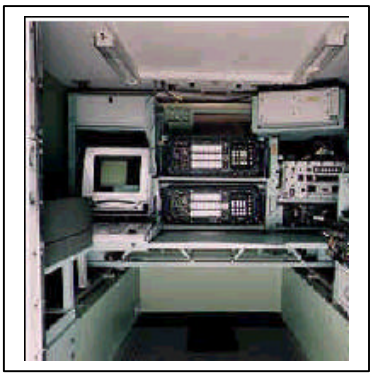
(COMSEC), narrow-band voice capability, and LOS communications for voice and data

- Provides C2 for the corps and division warfighter nets; also supports Army Special Operations Forces C2
- A manpack radio, can support on-the-move voice and data communications between users
- With INC, SPITFIRE supports beyond LOS extension of the TI, operating in a retransmission mode

Communications Systems Linking Brigade, Division and Corps

Mobile Subscriber Equipment/Tactical Packet Network (MSE/TPN)

MSE



- Primary digital communications system among brigade, division, and corps CPs
- Provides both secure voice and data communications
- Forms a network covering the area occupied by unit-level users (or *subscribers*)
- Network consists of 4 to 6 (depending on the support unit's size) centralized Node Centers (NCs) extended by SENs and LENs
- Subscribers connect by wire to SENs and LENs or by radio to Remote Access Units (RAUs) which serve as local call switching centers; "long distance" calls are made through the NCs
- Asynchronous Transfer Mode (ATM) expands data and video capacity via Fast Ethernet Channel (FEC)

- Tactical High Speed Data Network (THSDN) is a interim technical measure to increase MSE bandwidth

TPN

- The TPN is the means by which information is formatted and overlaid on the MSE network for data transmission
- Packet switches at each CP break up data into packets, sending them separately along the most efficient path to their destination where they are reassembled
- The ATM hub switch provides fixed bandwidth for voice and flexible allocation of bandwidth for data and video
- The ATM mixes different kinds of information with different characteristics for transmission along the same path

Brigade Subscriber Node (BSN)

- Provides mobile communications switches and transmission systems through the use of commercial switches and routers
- BSN voice subscriber services uses a commercial Private Branch Exchange (PBX), a private telephone switchboard, which allows both Integrated Service Digital Network (ISDN) and analog service; like MSE, individual telephone numbers are assigned to each user
- The nodes use an ATM backbone which provides dynamic bandwidth allocation

- All services are Internet Protocol (IP) based, making the backbone transparent to the user
- Major Components:
  - Shelterized Assemblage provides integrated voice/data/video switching, network services, and integrated LOS radios in a Standard Rigid Wall Shelter
  - Brigade Remote Subscriber Services (BRSS) extends subscriber services (voice/data/video) over transmission systems or fiber optical cable
  - Network Management Client/Servers integrate software tools to manage both BSN nodal and WAN/LAN management
- Transmission is provided via satellite link or HCLOS radio
- Also extends subscriber services (voice/data/video) over transmission systems or optical cable

High Capacity Line of Sight (HCLOS) Radio

- Replaces the current AN/GRC-226 radios in the LOS AN/TRC-190(V)1, (V)2, (V)3, and (V)4 transmission systems
- Exceeds AN/GRC-226 throughput by four times, enabling a higher data transmission rate between MSE and ATM.
- Provides increased data transmission capabilities to support long range LOS radio communications for the Army's Area Common User System (ACUS); increases MSE range from 25 to 40 km

- Allows higher accuracy in data transmission

Single Channel Anti-Jam Manportable Terminal (SCAMP / found at brigade and division echelons)

- Provide a manportable, secure, anti-jam communications capability to the soldier; operates in stationary mode
- A satellite terminal, operates with MILSTAR and supports voice and data transmission, providing greater anti-jam protection, lower probability of intercept, and lower probability of detection

- Interfaces with MSE and CNR at brigade and division CPs
- Transmits and receives low rate data and voice in Extremely High Frequency (EHF) band in selectable, point-to-point broadcast modes; has paging capability and provides range extension for the TI

Secure Mobile Anti-jam Reliable Tactical-Terminal (SMART-T / found at division and corps echelons)

- A transmit and receive, EHF satellite terminal for MILSTAR systems
- Primary mission is multi-channel, near global extended range connectivity for the Army's MSE
- Extends the range for selected MSE NCs, LENs, SENs, and RAUs

- Supports Echelons Corps and Below (ECB) and special contingency operations/communications with other service MILSTAR terminals

- Provides tactical commanders with secure, jam resistant, extended range, two-way, point-to-point and network voice, data, and imagery communications
- Provides Over-the-Horizon (OTH) transmission capability
- Highly mobile, terminal is fully integrated on a single HMMWV
- Provides secure, anti-jam and low probability of intercept/detection communications
- Designed to operate and survive in severe electronic warfare and NBC environments

Network Management

Integrated System Control (ISYSCON)

- Integrates overall system control of the Army's tactical communications networks; fielded in various configurations of servers, workstations, and remotes at corps signal brigade and division signal battalion
- A suite of hardware and software that gives signal personnel the automation capability to engineer, plan, and operate all communications systems, including MSE

- Provides centralized management of the tactical communications network, establishes an interface with technical control facilities in the ABCS architecture, and enables automated configuration and management in a dynamic battlefield data network
- Allows commanders to interact with ABCS by

exchanging common battle command information with the force commander and his staff and by exchanging communications information with maneuver force signal officers

- Provides the tools to perform the information management process by automating the following items: network planning and engineering; mission plan management; battlefield spectrum management; COMSEC management; system administration; and LAN management

Notes

Notes

Notes

CHAPTER 4
DIGITAL COMMAND POST OPERATIONS

Overview: This chapter provides a brief overview of the organization, roles, responsibilities, and techniques for conducting effective and efficient operations in a digitized command post.

4-1 Introduction

The Army is making rapid and drastic changes in CP design taking full advantage of the newest computer technology. The CPs for digitized units will be small, mobile, deployable, and equipped to access, process, and distribute the information and orders necessary for their echelon. This chapter outlines the internal operations of a digital CP. More detailed discussion can be found in FM 71-100-1, FM 71-100-2, FM 71-100-5, and FM 101-5.

4-2 Data Exchange

Central to digital CP operations is the manner in which it exchanges data. ABCS systems share information either directly with one another or through the JCDB. The JCDB resides on all the ABCS computers in a CP and provides the data for the common applications that generate the COP. Battlefield information dynamically flows back and forth between ABCS systems and the JCDB. When data is entered through a BAS, this change is forwarded to all ABCS subscribers on the CP's tactical LAN (TACLAN) and posted to the COP (see Figure 4-1).

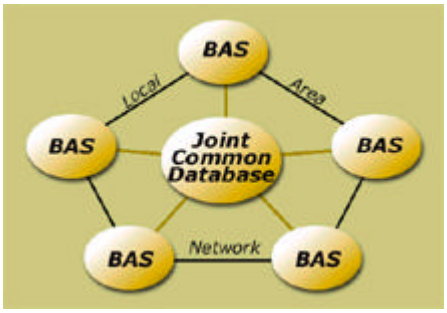


Figure 4-1. Data Exchange within a CP LAN

Data is also exchanged between CPs. This allows the same data to be maintained in the JCDBs in different CPs. Data generated by each BAS flows to its counterpart BAS at adjacent echelons. Each BAS then transfers this information to the JCDB at that echelon via the TI. Friendly or "blue" picture position information flows from FBCB2 upward through EBC on the server located at each echelon. This information is then deposited into that echelon's JCDB. This data exchange ensures all TOCs have JCDBs resembling one another. This is key to creating the COP.

Figure 4-2 shows this data flow between an example battalion and brigade with their MCS systems operating as servers. Note the flow of friendly position information (depicted by dashed arrows) moving between EBC at these echelons and into their respective JCDBs. Each BAS can, in turn, access this friendly picture from the JCDB at their echelon. The flow of data from a BAS to other BASs and the JCDB is shown by solid arrows.

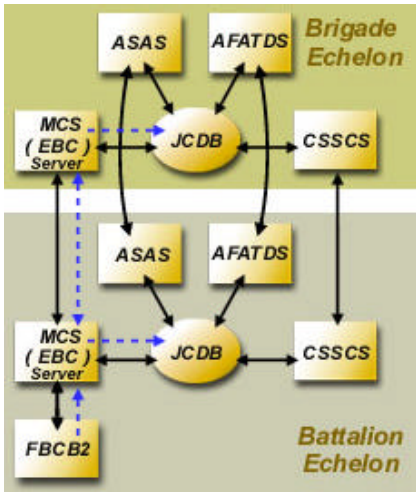


Figure 4-2. Data Exchange between CPs

4-3 Digital Command Post Layout

The Standardized Integrated Command Post System (SICPS) is the new generation of CP facility systems to support digitized units. SICPS is a C2 enabler, providing the platforms from which to conduct digital CP activities. Its primary purpose is to support C2 of digitized units by housing their ABCS systems. SICPS is designed to facilitate CP operations by providing the flexibility, commonality, and operational capabilities needed to enhance unit mobility and integrate ABCS and associated communication and networking equipment. It supports the integration of these C4ISR assets into platforms that can serve as a stand alone CP or as an integrated element in a larger digitized CP. The SICPS has seven CP variants to include track and wheeled vehicle mounted, vans, tents, and hard shelters.

The digital CP will collocate staff sections and supporting communications systems to facilitate both face-to-face interaction and digital data exchange as shown in the example at 4-3.

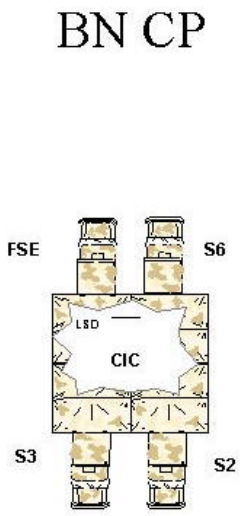


Figure 4-3. Typical Digital CP Layout

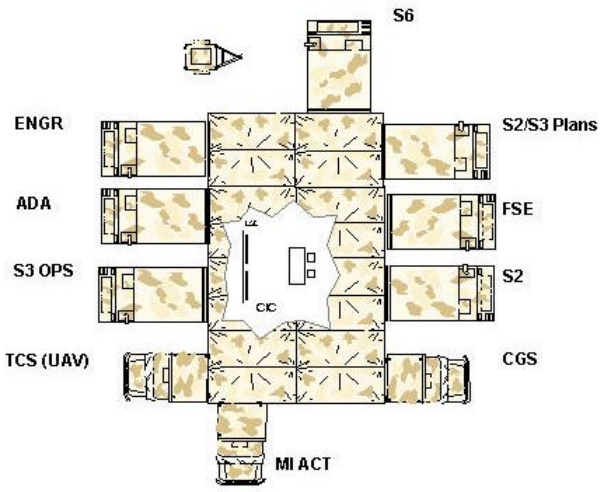


Figure 4-3 (continued). Typical Digital CP Layout

Figure 4-3 shows but one configuration for the digital CP. Specific unit SOPs may differ from this example. For the latest CP architecture, access the FORCE XXI Central Technical Support Facility (CTSF) website at:

http://150.114.141.187/ctsfmain.html
Password and log on: CTSF

As with the analog CP, the digital CP's physical setup must facilitate communication and analysis of information as well as accommodating computer hardwire requirements. Within the digital CP, information is processed at two locations: individual workstations and the Combat Information Center (CIC). The focus of the individual workstation is the individual BAS and the specific BOS it supports. At his workstation, the staff member inputs and monitors data within his sphere of responsibility. He also will access data posted to web pages and shared files by other staff sections in the LAN and WAN to carry out his BOS functions and duties.

The focus of the CIC is integrated battle monitoring and decisionmaking. It is a special location within the CP for the display of information. The CIC is the central area for viewing information in order for the commander and his staff to maintain SU. This is accomplished through the Large Screen Display (LSD) which is the only area in the CP where all key BAS data can be viewed simultaneously. It is therefore the place where battlefield vision is best supported. The commander uses the CIC to illustrate his guidance and, with his staff's assistance, to develop and maintain the COP.

The LSD is a portable projection system using Triple Super Twisted Nematic technology to display up to 24,389 color pixels at 1024 X 768 resolution. Power is provided for 100/240 VAC and is adaptable to tactical vehicle power sources. The LSD has on-screen set-up menu displays, rear projection mode, and remote control capability. The resident 400-watt quartz halogen lamp uses 15-foot diagonal images to accommodate large target audiences.

CICs will vary by unit Modified Table of Organization and Equipment (MTOE). However, the typical CIC has two LSDs, each capable of displaying nine sub-screens. Each sub-screen can display the COP and can be configured in various ways to best support the commander’s information display preferences. The more sub-screens used, the lower the resolution of the image. It is therefore recommended that each LSD screen use no more than four sub-screens. With two

LSDs, this allows the display of eight sub-screens which should ordinarily be sufficient. The addition of the engineer battalion LSD will increase this display capability.

4-4 CIC Data Display Management

Information Operations (IO) play a key role in a commander and staff's ability to maintain an accurate picture of the battlefield in the CIC. With feeds from each ABCS system, the CIC's LSD enables them to see more of the battlefield and to receive greater amounts of real-time battlefield information by BOS than is currently available with analog systems. More information is not necessarily beneficial to mission planning and accomplishment. Data must be filtered, fused and focused to create meaningful informational displays relevant to the commander's mission. These displays or tactical pictures must therefore be presented in a logical manner on the LSD in order to support SU.

CP digitization has caused analog maps, acetate, and wing-boards to be replaced with digital overlays and electronic files. Because electronically stored information is readily available through a minimum number of computer keystrokes, there is also less need to actually print paper copies of the information. However, information saved electronically has a tendency to be "out of sight, out of mind." Leaders and staff must therefore know what data is available to them in order to make conscious decisions as to what will be displayed.

Though the LSD has the capability of displaying any BAS' electronic data, the narrative and static aspects of some information still lends itself to paper copy posting within the CP. This is especially true for information that is less likely to change during a mission such as CCIRs and the synchronization matrix. In turn, this optimizes the use of LSD sub-screens by freeing them to depict dynamic ABCS digital content.

The commander, XO/S3 and battle captain must be able to orchestrate BOS coordination through the display of key information on the LSD. Each staff section must therefore maintain information relating to their BOS using visual graphics that support the COP. To facilitate information control and display, staff sections and their supporting systems should be arranged around the LSD to facilitate staff interaction, coordination and information analysis. The COP is displayed on the LSD through one ABCS system, typically the S3's MCS or MCS-Light. COP control and manipulation and CP LAN administration are aided by centrally collocating the CP server and the BAS that projects the COP. The ability to view the LSD through the BAS controlling the COP also facilitates communication and navigation through data. During discussions in the CIC, personnel can focus staff on key portions of the COP either verbally or with a laser pointer.

Data will be displayed on the LSD via the COP using the ABCS COP application or through overlays provided by individual BASs. To portray the COP graphically requires Mission, Enemy, Terrain, Troops, Time, Civilian (METT-TC) analysis of information. The COP displays enemy (shown as red feed and graphics), friendly (shown as blue feed and graphics), terrain (shown as characteristics and impact) and civilian considerations (shown as gray feed and graphics). Friendly analysis occurs in the CIC by all BOS sections and systems. Each BAS provides BOS overlays for subsequent data manipulation and consolidated viewing in the form of operational pictures that form the COP. Enemy analysis is especially time sensitive information. This demands ready availability of ASAS and Tactical Unmanned Aerial Vehicle (TUAV) systems that are protected from CP traffic flow.

The MCS whiteboard or electronic whiteboard (also known as "Show me") equips leaders and staffs with the capability to conduct collaborative sessions. Participants at distributed locations view the same enemy and friendly COP on an MCS display and are linked with audio. The "telestration" feature of whiteboard allows each participant to use a mouse with a crayon drawing capability to

visually depict locations, graphics, and other coordination measures that can be seen on the participants' screens.

4-5 Digital Staff Estimates

Not all key information can be graphically depicted on the LSD. Such information must therefore be captured in a readily available, continuously updateable format for quick dissemination and assimilation. FM 101-5 emphasizes that each staff section should maintain a staff estimate (in narrative form at division and higher, in graphical form at brigade and battalion). In the analog CP, these graphical staff estimates correspond to wing board and map data. Digitization has eliminated the need to post information to wing boards but has created the need to organize digital data. Units must capitalize on the TACLAN web pages maintained by each staff section for organizing and posting critical mission data. By placing digital staff estimates on a web page, each staff section supports the commander's and staff's need to quickly review, update and use information for battle monitoring and planning (see Chapter 6 for detailed information on the Military Decisionmaking Process). Establishing a standard staff estimate format facilitates navigation through the estimate and cross-referencing between estimates. Staff estimates should also list available BOS overlays by name to better focus graphical review within the ABCS COP application and to focus all echelons and staff on the same, most current data. Through digitally equipped LNOs, analog units should access these digital estimates to obtain current operational data and to help synchronize their operations with digital units.

4-6 Information Management

The staff must be organized to support the information management process of filter-fuse-focus. This process will be guided by doctrine, Tactics, Techniques, and Procedures (TTPs), and unit SOPs. The staff must operate according to established procedures that specify access to common databases, common displays, and report formats. The staff must be organized to allow the vertical and horizontal flow of information. This organization should provide links between

teams within staff sections, between staff sections within a CP, and between CPs at the same, higher, and lower echelons.

Digitization enables commanders and staff to focus more on the execution of combat operations and much less on planning, coordination, and the processing of information. Commanders and staff will have much more data upon which to base their decisions. Their challenge therefore will be to manage the flow of vast amounts of data so that the right information gets to the right person at the right time. These specific challenges are:

- *Relevancy*: Determine the relevant information from among the vast amount of data available.
- *Responsibility*: Ensure that each product is the assigned responsibility of a specific staff section.
- *Accuracy and Currency*: Ensure that the data is correct and up to date.
- *Dissemination*: Ensure that information generated by the staff gets to the right personnel.
- *Evaluation*: Ensure that information is appropriately assessed.

Relevancy

Because of the large quantity of data available, it is especially important for the commander to establish information priorities in order to focus the staff during their data collection. These priorities must address the Relevant Information to the specific operation. The commander provides this focus via CCIRs which are:

- Specified by the commander and applicable only to him
- Situation dependent and linked to present and future operations
- Based on events or activities that are predictable
- Time sensitive (answers to CCIRs must be reported to the commander by the most rapid and effective means)

Table 4-1 summarizes the CCIR responsibilities.

Commander	• Establish CCIRs • Establish priorities for information collection and distribution • Assign assets to collect information • Determine display of information throughout his command during an operation
Chief of Staff/ Executive Officer	• Manage CCIRs • Establish TTPs for tracking when and how CCIRs are answered • Assign responsibility to personnel within staff sections and CPs to manage information • Supervise commander's guidance for collecting, processing, and circulating information
Staff Leaders	• Manage information within BOS • Recommend CCIRs based on analyses • Record, evaluate, analyze and report collected information to answer CCIRs
Staff Section Operators	• Monitor ABCS traffic • Know what to file, what data to display, what to name/rename files, and where to store them • Know what graphics to display • Be alert to CCIRs and know how to act on them

Table 4-1. CCIR Responsibilities

Responsibility

The diverse products produced using ABCS must each be the responsibility of specific staff sections. This responsibility will usually be obvious, being based on doctrine. Unit SOPs/TTPs must confirm these doctrinal responsibilities while ensuring that all other products are the assigned responsibilities of specific staff sections. Table 4-2 lists typical products and tasks, the ABCS tools typically used to produce them, and the staff section responsible for them.

Staff Section	Product/Task	ABCS Tool(s)
All/Misc Sections	CCIRs	Office products / file sharing / MCS Plan Manager
	Order/Plan Annexes	COP Plan / Office products / MCS Maps and Overlays
G3/S3	Timelines for Producing Orders and Plans	MS Office products / FTP
	Plans/Orders	Common Message Processor (CMP) / MS Office products / file sharing / COP Plan / OPLAN/OPORD Tool
	Specified, Implied & Essential Tasks	Derived from higher orders/plans and posted via MCS to homepage
	Higher Headquarters Graphics	via MCS or COP / COP Plan / web page
	SOPs of higher headquarters	MS Office products / FTP
	Commander's and Operations Estimates	Staff Estimate Template in MS Office products
	Time Phased Force Deployment Data	GCCS-A Commander's Force Analyzer
	Current/Planned UTOs	UTO Tool
	Commander's Guidance	MS Office products, COP
	Area of Operations	COP Operational Overlays / Maps and Overlays
	Airspace Control Measures	TAIS
	Airspace Deconfliction	TAIS

Table 4-2. Staff Products, Responsibilities, and ABCS Tools

Staff Section	Product/Task	ABCS Tool(s)
G3/S3 (Continued)	Air Traffic Services	TAIS
	Relative Combat Power	MCS COA tool - force ratio calculator
	Battle Space Overlay	COP Operational Overlays / Maps and Overlays
	Battlefield Environment Overlay	COP Operational Overlays / Maps and Overlays / COP Plan
	Time-Space Analysis	MCS Distance Rate Tool
	Wargaming	DaVinci Tool / COP Plan / COP / CMP / MCS COA Tools
	Courses of Action	COP Operational Overlays & SU / CSSCS web page / MCS Plan Manager / Force Ratio Calculator / DaVinci / MS Office products
	Synch Matrix	MCS Synch Matrix
	Decision Support Template	MS Office products
	COA Decision Matrix	MS Office products / MCS Plan Manager
G2/S2	Intelligence Estimate	Staff Estimate Template in MS Office products
	Obtain Higher Intelligence Products	Downloaded from higher headquarters' websites and shared folders
	Distribute Higher Intelligence Products	Post to unit websites and shared folders and/or send to users
	Request for Information (RFI)	CMP / COP / COP Plan / MS Office products / ASAS reachback capability
	Intelligence, Surveillance & Reconnaissance (ISR) Plan	DTSS products / COP Operational Overlays / COP Plan / MS Office products / CSSCS web page / CMP / file sharing
	Alerts	enemy target alerts via ASAS
	Automated Targeting	target nomination via ASAS
	Enemy Situation	ASAS enemy SITTEMP
	Modified Combined Obstacle Overlay (MCOO)	COP Plan / Operational Overlays / MCS Maps and Overlays
	Area of Interest	COP Operational Overlays

Table 4-2 (continued). Staff Products, Responsibilities, and ABCS Tools

Staff Section	Product/Task	ABCS Tool(s)
G2/S2 (Continued)	Order of Battle Files, Threat Records, and Threat Models	COP Operational Overlays, COP Plan, MS Office products, ASAS-RWS
	Threat Doctrinal Template	COP Operational Overlays
	Threat Capabilities Overlay	COP Operational Overlays / MS Office products / Word Templates / CMP
	High Value Target List	COP Plan / COP
	Prioritized Threat COA Lists	COP / MS Office products
	Event Template Overlay	COP / MS Office products
	Event Matrix	MS Office products
	PIR	COP / COP Plan / MS Office products
	SIR	COP / MS Office products
G1/S1	Personnel Daily Summary	CSSCS web page
	Personnel estimate	staff estimate template in MS Office products
G4/S4	Logistics estimate	staff estimate template in MS Office products
	Materiel status	CSSCS web page
	Unit status	CSSCS web page
	Supply Class Report	CSSCS web page
	Capability Report	CSSCS web page
	Supporting Assets Status	CSSCS web page
	Wargaming	CSSCS COA Tool
	Resource Requirements Forecasts	GCCS-A Logistics Analyzer
	Logistical Support Plan	COP / MS Office products
	Combat Service Support Overlay	MS Office Products / COP / COP Plan
G5/S5	Civil-Military Operations estimate	staff estimate template in MS Office products
G6/S6	Signal estimate	staff estimate template in MS Office products
	Network Analysis	ISYSCON
	COO Analysis for Signal Implications	COP Operational Overlays / DTSS Foliage Overlay / COP Tools>Radio LOS Analysis / MCS LOS Tool

Table 4-2 (continued). Staff Products, Responsibilities, and ABCS Tools

Staff Section	Product/Task	ABCS Tool(s)
Engineer Section	Digital terrain data coverage of current/future general AO and area of interest	DTSS
	Combined Obstacles Overlay (COO)	COP Operational Overlays / MCS Operational Overlays / IMETS
	Terrain Overlays	DTSS Overlay Provider / DTSS Overlays from Web Page
	Mobility Analysis	DTSS mobility analysis products
	Intervisibility Analysis	DTSS intervisibility analysis products
	Three-Dimensional Terrain Views	DTSS
	Engineer Plan	COP / MS Office Products
	Engineer Overlay	MS Office Products / COP / COP Plan
Air Defense Section	Sensor and Weapons Coverage	AMDPCS Mission Planner
	Friendly and Hostile Air tracks	AMDPCS Mission Planner
	Air Avenues of Approach and Airfields	AMDPCS Mission Planner
	COO Analysis for Air Defense Implications	COP Operational Overlays / COP
	Air Defense & Early Warning Plan	COP / MS Office Products
	Air Defense Unit Status	AMDPCS Unit Status Screen
	Weapon and Sensor Visibility	AMDPCS platform capabilities and DTSS digitized elevation data
	Air Defense Overlay	MS Office Products / COP / COP Plan
Chemical Section	COO Analysis for NBC Implications	COP Operational Overlays / COP
	WMD/Smoke Overlays	COP Operational Overlays / DTSS Overlays
	Chemical Overlay	COP / MS Office Products

Table 4-2 (continued). Staff Products, Responsibilities, and ABCS Tools

Staff Section	Product/Task	ABCS Tool(s)
FSE	Fire Support Analysis	COP Operational Overlays / DTSS Overlay
	Artillery Dead Space Overlay	COP tools > terrain analysis > indirect fire weapons
	Wargaming	AFATDS COA Tool
	Weapon-Target Pairing	Automated engagement recommendation via AFATDS
	Fire Missions	CMP with MCS, CSSCS, AMDPCS, and FBCB2
	Fire Mission Results	CMP with ASAS
	Engagement Guidance and Prioritization	AFATDS Target Management matrix
	Fire Support Planning	AFATDS decision aids and analytical tools
	Fire Support Overlay	Office Products / COP / COP Plan
SWO	Weather Data Integration	Multi-source weather data access via IMETS
	Battlefield Forecasting Model Products	IMETS
	Severe Weather Warnings	CMP via USMTF
	Weather Effects Overlay	IMETS IWEDA tool
Other Special Staff	Respective estimates on designated web page and/or shared folders	Staff estimate template in MS/Star Office products

Table 4-2 (continued). Staff Products, Responsibilities, and ABCS Tools

Accuracy and Currency

Because ABCS is automated, it allows information to flow much more quickly and accurately. However, while ABCS may be automated, not all of its information flows *automatically*. In fact, most of it does not. Only friendly position data (which supports the friendly or "blue" picture) flows automatically via EPLRS and EBC without action by operators. For all other data to enter and flow throughout ABCS, each BAS must be properly initialized and its data maintained.

Staff sections will have ready and routine access to the many products of other staffs and units at varied echelons. This outside access may take place without a staff section even knowing about it. It is therefore incumbent on staffs to ensure they continuously post their most up-to-date products and maintain them on staff web pages and/or shared folders. CP internal procedures must likewise specify routines and suspenses for producing and revising ABCS products and where they will be maintained.

Dissemination

Due to bandwidth limitations, it might not be possible to routinely send out products through email. On the other hand, it is insufficient to merely post information to a web site or shared folder and expect others to use it. With the exception of routine, scheduled postings/updates, staff must therefore proactively notify users when such changes are made. When a product is posted or revised, staff sections must notify other staff sections/units at the same, lower, and higher echelons. This notification must include instructions on precisely where to find the product and its file name. This will require units to establish SOPs that specify file naming conventions and file management procedures.

Whether forwarding products or providing notification of product postings in shared files/web pages, it is absolutely essential that the right personnel receive the right information. Correct address information using the ABCS address books and Message Handling Tables (MHTs) must be established to ensure that data will be sent to the correct BASs. Addressees must be the users employing the individual ABCS system rather than generic role names in the address book. If this is not done correctly, information on one BAS will not flow to other BASs even in the same TOC. During initialization, operators must also create and distribute databases which can be done via messages in the current version of ABCS. This will ensure that BASs are able to share the right kind of information.

Evaluation

There is a tendency to accept computer data at absolute face value because it is computer-based and therefore assumed to be always correct. Users of digital systems must resist this tendency. Error can be introduced through failures in BASs, databases, and communications systems, human error in inputting data, failing to update information in a timely manner, etc. Data must therefore be evaluated within the context provided by SU to verify that it is accurate and current. Users must follow up discrepancies to ensure they have the right information.

4-7 Digital Duties and Responsibilities

Staff functions as described in FM 101-5 will not fundamentally change in the digital CP. However, these functions will be carried out differently using the digital tools that ABCS provides. Digitization will also require personnel to perform new functions as listed below. These are a compilation of duties from Warrior-T products and from lessons learned by the digital force. These digital CP post tasks should be conducted in addition to and as a part of standard staff responsibilities.

Commander

- Provides command guidance for employing ABCS
- Provides C2 of automation resources
- Establishes automation support priorities
- Specifies the unit's COP (see Chapter 5)
- Establishes the CCIRs and ensures they are depicted in ABCS
- Ensures subordinate leaders are trained in the employment, operation, and sustainment of automation
- Trains subordinate leaders and staff to create, maintain, distribute and use the COP

Chief of Staff/Executive Officer

- Coordinates the staff to ensure ABCS integration across BAS
- Ensures the staff integrates and coordinates its ABCS activities internally, vertically (with higher headquarters and subordinate units), and horizontally (with adjacent units)
- Manages the CCIR; ensures satisfaction of the CCIR
- Directs the creation and distribution of the COP to include procedures for updating enemy and friendly SU
- Monitors the information filters, collection plans, and networks that distribute the COP
- Provides guidance for automation support
- Coordinates the staff to ensure automation support
- Coordinates procedures for inter-CP VTCs and white board sessions
- Directly supervises the main CP and headquarters cell to include displacement, protection, security, and communications
- Monitors liaison teams with analog (non-digitized) units and joint/allied forces for their contribution to the COP

G1/S1

- Responsible for personnel functions of CSSCS
- Employs CSSCS to monitor and report on personnel-related portions of Commander's Tracked Item List (CTIL)
- Manages Standard Installation/Division Personnel System (SIDPERS) interface with CSSCS

G2/S2

- Acts as staff proponent for ASAS and IMETS
- Supervises ASAS and IMETS operations and support
- Provides guidance on employment and support of ASAS and IMETS
- Supervises the information security program; evaluates security vulnerabilities
- Assists the G6/S6 in implementing and enforcing LAN security policies
- Provides software application expertise on proponent systems

G3/S3

- Acts as staff proponent for MCS, AFATDS, AMDPCS, and FBCB2
- Plans, integrates, and employs ABCS
- Develops the ABCS annex for plans and orders
- Develops ABCS annexes to the garrison and tactical SOPs
- Oversees offensive IO and defensive IO
- Provides operational and support guidance regarding network employment to subordinate units
- Is overall responsible for IDM
- Creates, maintains and displays the COP; maintains SU of all units
- Coordinates with G6/S6 for communications connectivity in support of ABCS
- Plans and monitors operator digital sustainment training
- Provides software application expertise on proponent systems.
- Assigns liaison officers and coordinates their digital support

G4/S4

- Acts as staff proponent for CSSCS
- Supervises CSSCS operations and support
- Provides guidance on employment and support of CSSCS
- Monitors and reports on the status of all automation equipment
- Provides software application expertise on proponent systems

G6/S6

- Serves as signal Subject Matter Expert (SME) to the commander; advises the commander and staff on all signal support matters
- Monitors WAN performance; integrates the CP LAN
- Is responsible for all automation information systems, automation and network management, and information security
- Ensures consistency and compatibility of automation systems
- Manages the TI; responsible for network employment, network configuration, and network status monitoring and reporting
- Receives planning worksheets with LAN/WAN requirements
- Ensures unit information network connectivity between unit and higher/lower echelons
- Plans, coordinates, and manages network terminals
- Develops, modifies, and manages network need lines, UTO, and base configuration files
- Plans, coordinates, and manages communications links to include reach-back communications

- Coordinates with higher echelon signal officers for additional communications support
- Develops and coordinates the signal digital support plan
- Determines system and retransmission requirements for the tactical situation
- Coordinates with higher, adjacent, and subordinate units in development of the signal digital support plan
- Manages the release of ABCS software within the unit
- Provides a focal point for automation support (Help Desk)
- Implements and enforces LAN security policies
- Establishes COMSEC accountability, distribution, destruction, and security procedures within the unit

Mission Application Administrator

- Helps the S6 manage the network
- Plans and coordinates the linking of BAS to the unit CP
- Supervises, installs, operates and performs unit level maintenance on multi-functional/multi-user information processing systems, peripheral equipment, and associated devices in mobile and fixed facilities
- Performs analyst functions; constructs, edits, and tests computer system programs
- Performs preliminary tasks necessary for CP LAN initialization
- Assists in troubleshooting digital systems
- Conducts data system studies and prepares documentation and specifications for proposals

- Maintains master copies of software
- Backs up data for user owned and operated automation information systems
- Assists in recovery of digital data at user level
- Operates and performs PMCS on assigned vehicles and power generators
- Monitors BAS PMCS program
- Coordinates repairs with S6 section

Battle Captain/Battle Staff NCO

- Oversees operations of assigned BAS
- Controls/directs the initialization of the BAS within the CP LAN (Battle Staff NCO)
- Ensures information flow and necessary coordination take place between and within each staff section and with higher, adjacent, and lower headquarters
- Accesses and employs information through ABCS in support of operations and planning
- Ensures key BAS products are available and current in support of the mission

BAS Operators

- Installs and operates assigned digital hardware and software
- Establishes connectivity of assigned BAS within LAN/WAN; ensures system interfaces with correct tactical communications
- Inputs operational data
- Produces reports required by commanders and staff leaders
- Performs PMCS on assigned BAS

- Isolates, identifies, and tracks digital system problems
- Maintains continuity of digital operations
- Maintains portions of the COP, as assigned
- Ensures unit-level information security

4-8 Management of Digital CP Personnel

Battle Rosters

Each section within the CP must maintain a digital battle roster listing the section operators assigned to each BAS. At a minimum, sections should plan for three operators per system: two soldiers to man a twelve-hour shift each plus one soldier to serve as a backup and to provide periodic relief. The roster should list the following:

- Personnel name and rank
- Assigned BAS
- Assigned shift
- Date of most recent training on system
- Software version of most recent training
- Estimated date of departure from unit

Operators should be managed in a manner similar to unit vehicle drivers according to the following principles:

- Depth: Have more trained operators than needed to ensure BAS coverage even when unanticipated losses occur
- Anticipate: Know when personnel are scheduled to depart the unit and train their replacements well in advance

- Leaders: Section leaders should be prepared to function as operators; in addition to providing additional coverage, this will enable section leaders to better supervise and employ the BASs they oversee
- Currency: Operators must be trained on the most current software carried on their BAS

Shift Management

Shift changes are usually scheduled at 12-hour intervals. Commanders should consider offsetting shift changes at mid-shift for key personnel. Staggering personnel in this manner will maintain a constant interface of new and old shift personnel. This will ensure that at least one individual knows what happened during the previous shift. Figure 4-4 provides an example.

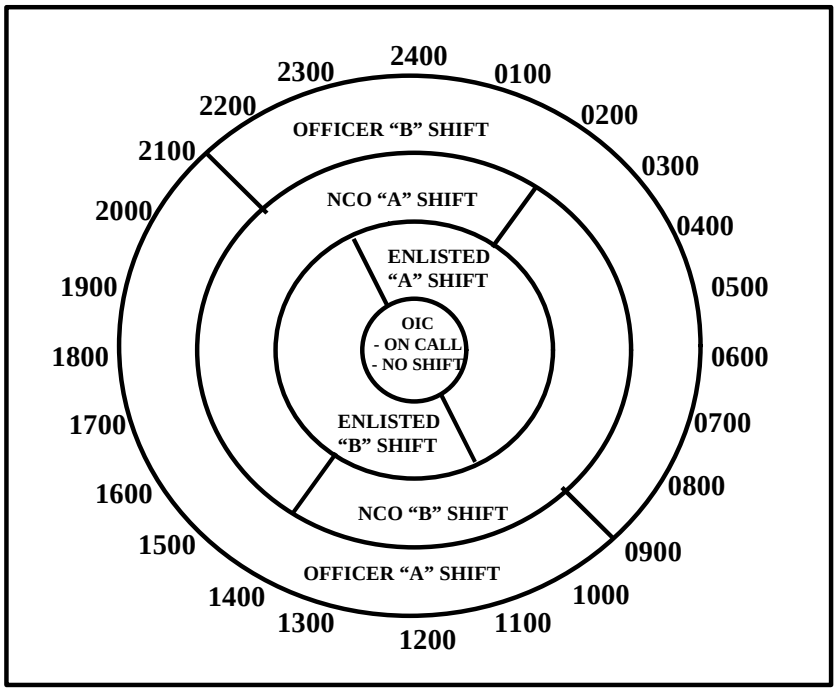


Figure 4-4. Staggered Shift Changes

Soldiers must conduct a one-on-one exchange of information with the person they are relieving. This must be followed by section-wide debriefs to ensure continuity in information flow and handoff of ongoing staff actions.

Following the individual brief, section level products and actions should be reviewed. Each staff section should accomplish the following actions:

- Review the digital journal for the past 12 hours
- Review and update any CCIRs, PIPs, and IRs
- Review the current approved overlays

- Review the current COP products
- Check files to ensure standard naming conventions are used
- Review the UTO
- Check section web products for updating and to ensure they are posted properly

A collective information exchange in the form of a shift change brief must be conducted so that the incoming shift receives a positive change of control. Annex B provides a recommended detailed checklist to use while conducting an individual/counterpart shift change brief. Personnel from different staff sections will have access to the key information produced by other sections and CPs. This means that these handover briefings will focus much less on the rote exchange of information. Rather, these briefing sessions can function to focus personnel on available information, evaluation of information, the status of the current operations, and tasks to support future operations.

Critical digital considerations should be briefed collectively within the CP. Table 4-3 provides a good example of what this brief may look like. There is presently no doctrinal guidance on this process. Units should therefore develop SOPs to address this requirement.

S3 Battle Captain	• Current higher and brigade changes to task organization • Disposition/status of units • Current and future missions • Current operations • LNO updates • Combat power status • Projected operations over next 12 hours • Current timelines
S2 / Weather	• PIR/CCIR • Current SU and location/status of all ISR assets (national to division/brigade) • RFI/RFA to higher (ARFOR or national). • Weather – next 12 hours and impact/effects on friendly and enemy systems • HVT/HPT • Battle damage assessment • Significant activities during the past 12 hours
FSE	• Organization for combat • Unit locations and status • Priority of fires • HPT/attack guidance matrix • Fire support control measures • Significant activities
ALO	• Preplanned request status • Immediate request status • In-flight reports
ADA	• Organization for combat • Current ADA warning status • Aircraft engagements • Location and status of ADA units

Table 4-3. CP Shift Change Brief Example

Engineer	• Operations since last update • Status of equipment and Class IV / V • Future engineer operations • Recommendations for the commander
Chemical	• NBC condition • Current & recommended MOPP • Enemy NBC activity • Chemical unit locations & status
S1 /S4 / Surgeon	• Equipment status • Class VIII status • Priority of support • Personnel status/health service status

Table 4-3 (continued). CP Shift Change Brief Example

4-9 Battle Rhythm

Battle rhythm is a non-doctrinal term which describes a process essential to effective and efficient battle staff operations. It is the cycle of recurring events within a CP that focuses staff members to meet information and action requirements. These recurring events include:

- Shift changes
- Targeting meetings
- Reports
- Battle updates without the commander
- Battle update briefings
- Commanders' collaborative sessions
- Battle captain collaborative sessions

The staff must achieve a battle rhythm for updating and viewing information and understand how to use it to affect operations. A well-established battle rhythm will aid the commander and staff with CP organization, information management and display, decisionmaking, and fighting the battle from the CIC and via satellite C2 systems.

Battle rhythm demands careful planning and design. There are many competing demands which must be deconflicted. Even subordinate units impact a higher echelon's battle rhythm based on their needs and unit procedures. Two key things to consider when establishing SOPs for battle rhythm are scheduled updates (both with higher and subordinate units) and bandwidth. ABCS competes for bandwidth with the commander’s digital updates or VTCs especially if the data passes over communications links between CPs. See Chapter 3 for techniques to mitigate bandwidth limitations. The MDMP can have one of the most dramatic effects on battle rhythm. The process is lengthy and detailed and must be closely coordinated with other ongoing actions (see Chapter 6). Figure 4-5 provides an example battle rhythm.

4-10 Battle Update Briefing

The purpose of this update is to provide the commander with analyzed information essential to decisionmaking and to synchronize the staff’s actions. Use of the COP expedites the battle update and makes it more current. The more information used from the COP, the more time the staff has to analyze and evaluate the information. The battle update briefing itself will center on the COP displayed in the CIC. The staff must be selective as to what other information is presented given the wealth of data and the fact that it is already available at each BAS. Unit SOPs, command guidance, and operational requirements will guide what information is briefed. Facts and capabilities may be presented in digital staff estimates for the commander to review prior to the briefing. This allows the battle update briefing to focus on by-exception information and on specific commander issues.

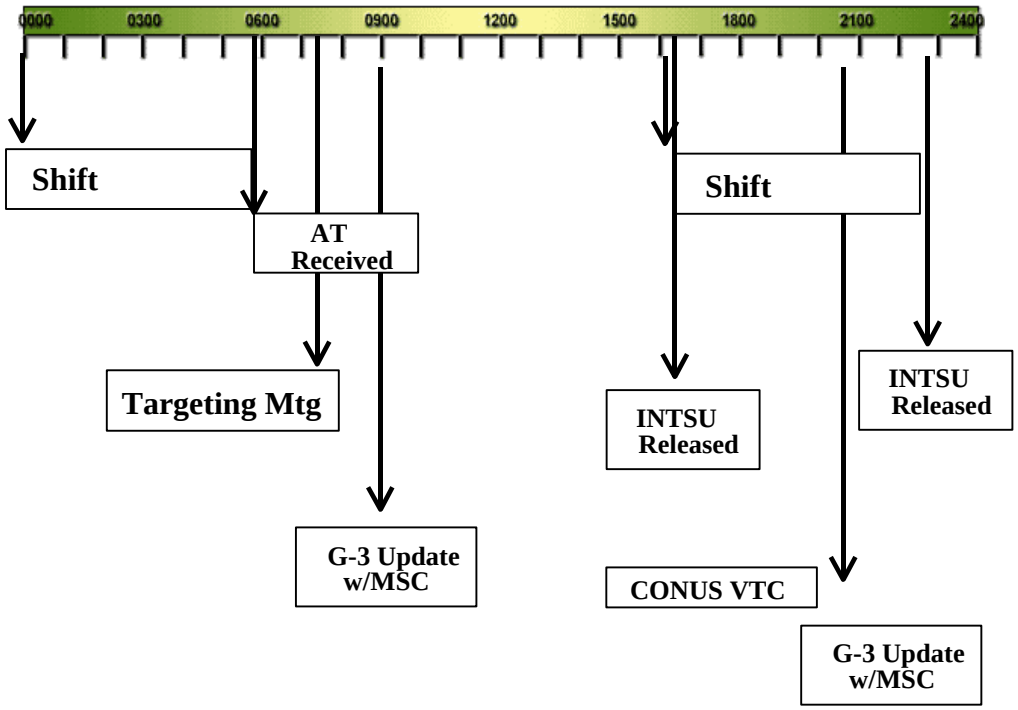


Figure 4-5. Example Battle Rhythm

Methods to update the commander depend on his location, connectivity, and the information he requires. Table 4-4 compares delivery methods.

Commander in CP	Commander not in CP
Verbal	Voice (radio, phone)
Over the shoulder of an operator	FBCB2
Commander's update page and pull-up information	MCS or access to another BAS at his location
Links to staff section pages and pull-up information	Collaborative session
Collaborative session	
Large Screen Display	

Table 4-4. Update Delivery Comparisons

Traditionally, these updates were a recounting of significant events since the last update. To build the update, the CP would establish an information cut-off ("as of") time. The focus was on maintaining SU. ABCS has altered this briefing from a staff brief to a constantly available information package focusing on the commander's needs. Table 4-5 shows how the briefing has evolved from its traditional analog form to its digital form.

Traditional	Digital
Significant events since last update	Commander accesses his own critical information needs
Current as of cut off time	Updated continuously
Periodic event	Available anytime
Current SU	Enhances SU
Staff presentations and their preparation were significant event	Staff routinely maintain information files which continues with normal operations

Table 4-5 Traditional vs. Digital Battle Update Briefings

Battle update briefs should maximize the use of information from BASs to aid in understanding the COP. Cutting and pasting information to non-ABCS briefing slides focuses on fact finding and less on analysis. The traditional form also consumes considerable time: 1+ hour to build/transmit slides; 1 hour to present (at brigade level); and 1 additional hour to present (at the division level). By the time slides are briefed, their information is outdated and inconsistent with the much more current COP.

4-11 Reduced Functionality

Reduced digital functionality will occur, for example, when one or more BASs are not working properly. In turn, this will degrade the contribution of the respective BOSs to C2. The realities and rigors of combat and field operations require digital personnel to be prepared to use ABCS with reduced functionality. They must develop a continuity of OPLAN that details establishing redundant, alternate, and archive information sources. Each of these sources should be prioritized and defined in the CP's Tactical Standard Operating Procedure (TACSOP). Likewise TACSOPs should include troubleshooting techniques and digital CP reboot drills to minimize the down time experienced for reboot operations. In its most degraded mode, the digital CP will revert back to analog operations.

Loss of functionality will require the digital staff to respond with the utmost urgency to restore normal capability. This may require a staff section or entire CP to simultaneously employ a double shift: one shift to restore functionality, the other to perform analog C2 for the current, ongoing operation. Lost data will have to be recovered (see below) while analog data will have to be entered into ABCS once functionality is recovered. Loss of functionality will vary by degree, and each situation will require varied corrective actions by the staff as outlined below.

Routine Procedures

- Each system will save information in ABCS COP overlay format for critical BOS items. ABCS COP SU overlays may periodically need to be saved as operations overlays to facilitate manual updates for digital graphics and unit icons. SU graphics and icons may not be available if the JCDB is inaccessible.
- Each system will utilize the ABCS common Snapshot Tool software to screen capture critical BOS information per an established battle rhythm to archive information.
- Each system should collaborate and share COP information vertically to aid retrieving critical information from same, higher, and subordinate systems.

Single BAS on LAN Crashes

- Note the Date Time Group (DTG) of last saved digital overlay in the ABCS COP application (JCDB) depicting the system information and assess need to take non-optimal actions.
- Employ other redundant systems within the CP or Future Operations cell to maintain data if reboot is extended.
- Request feeds from same/higher/subordinate systems if possible to update information.
- Manually manipulate operations overlay digital data through other ABCS systems with web page, CMP, or verbal input.
- Recall archived system BOS snapshot and continue tracking via non-ABCS application.
- Manually update system archive printout.
- Reproduce information on acetate overlay and post to analog map.

LAN Server Crashes

The MCS system is best oriented and constructed to act as the server. When the MCS crashes, the first ASAS or other MCS system to request information (ping) from the down server will attempt to become the server (an ASAS or another MCS may perform as server at the expense of degraded operations to its intended BOS use). Depending on the mission, the system should be brought down and rebooted to reestablish the server and subsequent IP address allocations. CPs need a battle drill for startup and reestablishment of the CP network that controls system boot up in a logical sequence that is repeated the same way each time the LAN is reestablished. This procedure significantly shortens the time necessary to reestablish the LAN. The server assigns IP addresses each time in the same order. The order should be prioritized by COP reestablishment, typically as MCS, ASAS, AFATDS, AMDPCS, and DTSS. Because it takes about an hour to reboot the system and reestablish operations, the CP should report its status to higher, adjacent, and subordinate units to ensure reports are sent via alternate means until the network is operational.

- Note the DTG of last saved digital overlays by BOS in the ABCS COP application (JCDB) depicting the system information and assess need to take non-optimal actions during server or LAN troubleshooting.
- Continue manual tracking of digital information within the ABCS COP and stovepipe applications with TACLAN overlay feeds if possible from higher and subordinate systems.
- Review the status of the CP secondary server or LAN and other LAN capabilities within the Future Operations cell, TAC, or Administrative and Logistical Operations Center (ALOC) to maintain data until a reboot is possible.
- Request information tracking from higher/subordinate systems if possible to maintain critical information.
- Manipulate operations overlay data with web page or verbal input.

- Recall archived system BOS snapshots and continue tracking via non-ABCS applications such as MS Paint or MS PowerPoint.
- Manually update system archive printouts.
- Reproduce critical BOS information on acetate overlays and post to analog maps.

Other Uses for Archival Information

Hardcopy JPEG snapshots (screen captures) of the COP and BOS COP screens have the following uses:

- Provide off-screen clarification or support "what if" analysis.
- May be sent to/received from other echelons to confirm the COP among CPs.
- Can be used in a white board collaboration (secondary to an actual ABCS COP application overlay) to discuss branch and sequel operations between BAS systems.
- Hardcopy printouts may be used as an interim update during COP build times.
- Snapshots also support After Action Reviews (AARs) and the historical tracking of battle information.
- Snapshots may be used in briefings or in OPORDs to illustrate narratives and to increase understanding of relational ABCS information formats.
- May be used to pass information to non-digital units via the TACLAN or LNOs to keep them apprised of the COP.

4-12 Analog Unit Interaction

Digitized units must be prepared to operate with non-digital units that do not have the technology to access the digital COP. Liaison parties will almost always be necessary to ensure full exchange of information between digitized and non-digitized units. The primary tasks of digital LNO teams are:

- Receipt and transmission of orders, graphics, and intelligence data via BAS
- Provision of friendly and enemy SU to the analog unit using its BAS
- Manual creation of the analog unit friendly and enemy SU and its transmission back to the parent organization
- Fire support and coordination

Procedures for supporting this interaction are discussed below.

Planning

It is essential for a digitized unit to exchange liaison teams with non-digitized units early and consistently throughout the planning process. Non-digitized units must strive to conduct parallel planning but will be at a disadvantage without digital staff tools. Parallel planning requires rapid exchange of information with analog units during the planning process. Involving higher, adjacent, and lower staff elements early in the planning process allows the entire staff to "see" both current and future operations and to identify known or potential problem areas. MDMP in a digitized setting is discussed in detail in Chapter 6.

Liaison Teams

Digital liaison teams may be sent to the analog unit's CP. This will provide at least some digital capability to analog units. These teams will support SU for both the digital and non-digital unit, the issue of orders, and informal information exchange. The number of liaison teams is limited, and these alone cannot solve the C2 challenges of analog units which are without digitally based SU. Liaison teams may be needed to escort elements of the analog unit, even down to single vehicles if necessary. This latter option will provide SU for these analog elements but is only practical if the digital unit forms additional liaison elements.

Equipment Requirements

The equipment and skills required of the liaison teams are a function of the type of operation being conducted and the force with which the team is coordinating. There are three basic forms of liaison which affect the task organization of liaison teams:

- Digital unit to digital unit: This requires the least equipment and personnel because information is easily shared in near-real time. Critical SU is maintained in each unit's knowledge base.
- Digital unit to analog unit: This may occur when conducting operations with some Active Component units, most Reserve Component units, and coalition forces. These teams require a full suite of digital systems to maintain the parent unit's COP and to provide SU of the non-digitized force back to the digital headquarters. Representation from each staff section may be required on the team.
- Digital unit to non-military forces/agencies: Same as for analog units, but augmented with additional specialties such as the S5/G5.

Notes

Notes

CHAPTER 5
COMMON OPERATIONAL PICTURE

Overview: This chapter describes the common operational picture (COP), the role of each BAS in the COP, the COP's components, some recommended COP procedures, and the COP's contribution to the operations process.

5-1 Definitions

Common Operational Picture (COP): An operational picture tailored to the user's requirements, based on common data and information shared by more than one command. The COP facilitates collaborative planning and assists all echelons to achieve situational understanding.

Operational Picture (OP): A single display of Relevant Information (RI) within a commander's area of interest. By collaborating and sharing RI, and tailoring it to their needs, separate echelons create a COP.

Relevant Information: All information of importance to the commander and staff in the exercise of C2.

Situational Understanding (SU): Knowledge and understanding of the relationship between forces which identify opportunities, threats, and gaps in information. It is the product of applying analysis and judgement to the common operational picture to determine relationships among the factors of METT-TC.

5-2 Composition of the COP

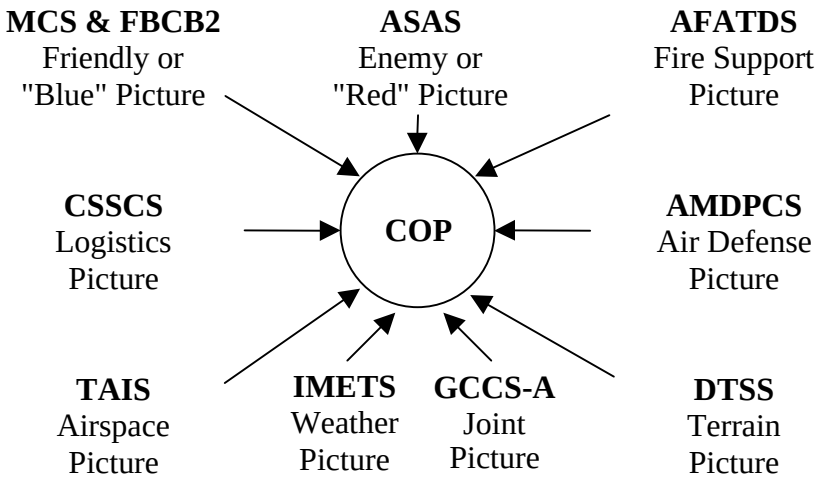


Figure 5-1. BAS Picture Contribution to COP

Each BAS provides its own unique view or "picture" of the battlespace which, taken together, comprise the COP (See Figure 5-1). The commander can tailor the components of the COP to fit the tactical situation, key features of the battlespace, and his own requirements for C2. The COP is dynamically updated; as data changes throughout the network, the COP reflects those changes. This enables personnel to "see" the battlespace more accurately and in near real time. Personnel can quickly access and display on one screen the critical, time-sensitive information, intelligence, and data drawn from the other BASs within the CP or from higher and lower echelons. Further details on the input from each BAS are provided on the following page.

BAS Input to COP:

GCCS-A: Political boundaries with countries differentiated by color; friendly and enemy ground units, naval vessels, obstacles, and military installations

MCS: Friendly unit locations; graphic control measures; orders; task organization

ASAS: Enemy unit locations, parentage, & status; enemy equipment, facilities, and individuals

AFATDS: Fire unit and radar range fans; Fire Support Coordination Measures (FSCM); preplanned fires; final protective fires; active fire support missions

AMDPCS: Air defense weapon and sensor coverage; location, speed and flight direction of aircraft; tactical ballistic missile launch and impact point, current track, and launch/impact point pairing line

CSSCS: Supply status by class of supply for units, facilities, and transportation features; supply and maintenance points and supply routes

FBCB2: Individual vehicle icons of platforms equipped with FBCB2

TAIS: Multi-dimensional display of ACOs and ACMs

IMETS: Standard weather symbology depicting current weather conditions, forecasts, and severe weather warnings; weather contour overlays to show 30+ different weather conditions (e.g., cloud cover, wind, precipitation, temperature)

DTSS: mobility, trafficability; line-of-sight tactical decision aids and background images

The remainder of this chapter provides further details on the components and construction of the COP. In addition, paragraph 5-13 provides further detail on the operational enhancements gained through the COP.

5-3 COP Components and Supporting Functions

ABCS supports the components comprising the COP as shown at Table 5-1.

COP Components	
COP Application	This is the software that combines various visual products to build and maintain the COP. These products consist of friendly and enemy forces data, operational graphics, and terrain and weather data. The COP interfaces with the JCDB and Joint Mapping Tool Kit (JMTK).
System Window	This acts as the digital map board (situation map). The System Window automatically loads on the screen through the JMTK. The System Window includes the Overlay Explorer Window.
Overlay Explorer Window	This is the Graphic User Interface (GUI) that manages the chart tabs, overlays, map objects (known as "children"), and various symbology tools (MilSym Manager). It is the graphical interface the user employs to select units and overlays from the JCDB, to filter them using modifiable criteria, and to display them on map backgrounds provided by the JMTK. This manages the overlays, objects, and information applied to the System Window (the digital map board)
Chart Tabs	These serve as the digital mapboards that contain static (notional) and CP (dynamic) overlays which are created by the various staff sections and units for planning and execution. The chart tabs are functionally like analog mapboards that use grease pencils and acetate and are posted around the various staff sections in a CP. The chart tabs are displayed in the System Window and are listed in the Overlay Explorer Window.
Map Areas	These allow the commander and staff to establish pre-set map views in an active chart tab. The map area is set to a certain scale, zoom, and map center. When a map area is recalled, it displays that pre-set map view which facilitates tracking the battle and disposition of forces without having to toggle to different chart tabs in the System Window.

Table 5-1. ABCS Support to COP Components and Functions

COP Components	
Static (Notional) Overlays	These are overlays that are particularly useful for planning and execution. They contain battlefield geometry, graphics, and planned or templated unit locations. The static (notional) overlays can be thought of as the analog acetate drops that can be overlaid together on a map. These overlays appear on active chart tabs along with that particular overlay's objects (symbols).
CP Picture	This is the "container' consisting of CP Overlays and CP filters.
CP Overlay	This is a dynamic overlay that receives updated or current live feeds and geometry. It includes CP filters and is posted to an active chart tab. The CP overlay is the companion overlay to the static (notional) overlay
CP Filters	These are associated with either a CP overlay or chart tab. The filters allow the operator to query the database for specific map objects. Those map objects are seen in a choice of filter types that include: unit information, enemy information, enemy unit information, enemy facility information, enemy equipment information, and battlefield geometry.
Supporting Functions	
JCDB	The COP application displays information from a shared database called the JCDB. It is the master database that contains information shared across BAS and supporting systems to include individual unit information. The JCDB is "invisible" to the user and need not be directly accessed by the user to build the COP.
JMTK	This is the graphical interface by which the user receives the desired map(s). It acts as the digital mapboard.

Table 5-1 (continued). ABCS Support to COP Components and Functions

5-4 Tailoring the COP

The COP application enables the commander to tailor the wealth of information into specified BOS COP views. Even though the information is functionally managed and updated by various systems throughout the TI, the Data Distribution Architecture ensures the availability of critical, time-sensitive information to the commander and staff.

The COP can be established and/or modified through the map areas and chart tabs. This can be done by manipulating their respective variables as listed at Table 5-2 according to unit SOP and command guidance.

Establish/Modify	Variables	By Manipulating
Map Areas	Map Settings	Scale Zoom Map Center
Chart Tabs	Overlays	CP Overlays Notional Overlays
	CP Filters	Friendly (blue) Enemy (red) Geometry

Table 5-2. Methods for Tailoring the COP

Map Areas: Map areas display portions of the map and allow the operator to switch between specified areas quickly. Map areas are set by specifying scale, zoom, and map center. The user can quickly switch between the specified Map Areas with different Center Grid coordinates and zoom scales of the battlefield without switching the Map Set.

Recommended map areas for inclusion in the COP are shown at Table 5-3:

Unit/Echelon	Map Area
Higher	map area for the next echelon above one's own
Own	map area for one's own echelon
Lower1 Lower2 Lower3 etc.	map area(s) for subordinate units at the next lower echelon from one's own (one map area per unit)
Adjacent1 Adjacent2 Adjacent3 etc.	map area(s) for adjacent elements

Table 5-3. Recommended Map Areas for COP

The center grid used on each map should also be specified.

While the requirements of a particular operation may demand some variation, ordinarily, the following maps scales should be used for the echelons indicated:

Echelon	Map Scale
Division	1:200,000
Brigade	1:100,000
Task Force	1:50,000

Filters: The operator builds a CP filter based on what his supervisor specifically directs him to display in the CP overlay or chart tab. The tools the operator uses to build the CP filter include filter attributes, filter values, and "operators" (-, +, <, >, =).

CP Filter Example: *An operator is directed to create an overlay with CP filters that only show current company units loaded into the database. The operator would create a CP filter overlay from the Overlay Explorer Window File menu pulldown and set the CP filter active to an active CP Overlay listed in the Overlay Explorer Window. From the Edit Window, the*

operator selects the desired filter type, which in this example would be unit information. From the Available Attributes Window, the operator selects Echelon and selects the company size value, then adds it to the Query Criteria panel in the Edit Window. The operator runs the database query from the "run query" icon in the toolbar of the Edit Window, and the operator finally selects the File menu pulldown of the Edit Window and selects "Update." The objects (company units) populate the Overlay Explorer Window and the objects appear on the map view.

5-5 Chart Tabs

Chart tabs consist of set map areas, static (notional) overlays, and CP (dynamic) overlays with associated CP filters. Live feeds display on active chart tabs. It is recommended that the number of chart tabs be kept to four because of current software limitations. Table 7-4 provides an example set of chart tabs for the brigade echelon and their corresponding overlays.

Chart Tab	Function	Overlays	Composition
OPNS	track & fight current battle	BDE MVR ENG_OBSTACTUAL	live feeds bde current operations
RECON	track & fight recon/counter -recon battle	ISR SITTEMP ENG_OBSTACTUAL	live feeds recon current operations counter-recon operations
CLR_FIRES	clear artillery fires	BDE MVR FS_FSCM FS_TARGETS FS_RNGFAN MVR_ACM	live feeds current fires current FSCM current ACM
REAR	track & fight activity in rear area	BDE MVR CSS_RTS CSS_POINTS	live feeds current MSRs current supply activities

Note: The "System" chart tab should be renamed to one of the four recommended above.

Table 5-4. Example Chart Tabs for Brigade Echelon

5-6 Overlays

COP Overlays are static (notional) or dynamic (CP). COP overlays contain battlefield geometry, graphics, planned or templated unit locations, and live feeds. Staff use static overlays for planning and execution. Dynamic overlays populate the JCDB from BOS legacy databases and are rendered to the COP by a CP filter, overlay, and picture definitions. Dynamic overlays are changing and current whereas the static overlays present a snapshot of time or disposition. The combination of static and dynamic overlays is used to synchronize and track the battle by the commander, staff, and battle captain.

5-7 Static (Notional) Overlays

The list at Table 5-5 is a sample of notional overlays that may be produced by the various staff sections of the battle staff. The Overlay ID column to the left is used in the overlay naming convention that is discussed further below. Example components for each overlay are also provided.

Overlay IDs	*Staff Section	Overlay Components
INTEL_R/S	S2	Named areas of interest, target areas of interest, observers
INTEL_MCOO	S2	Enemy air avenues of approach
INTEL_SITTEMP	S2	templated enemy maneuver platforms within security zone, templated enemy maneuver platoons beyond security zone, templated enemy obstacles
INTEL_OBST	S2	Known enemy obstacles
INTEL_WEATHER	S2	IMETS Weather Effects Overlay
MVR_DIV	S3	Division maneuver graphics
MVR_BDE	S3	Brigade maneuver graphics
MVR_TF	S3	Task force maneuver graphics; separate overlay for each battalion/task force

Table 5-5. Sample Notional Overlays

Overlay IDs	*Staff Section	Overlay Components
MVR_CO	S3	Company maneuver graphics; separate overlay for each company/team
MVR_DST	S3	Enemy most likely course of action, named areas of interest, possible target areas of interest, decision points, time phase lines, objective, boundaries, forward line own troops
MVR_ACM	S3 Air/ ADA	ACOs
FS_TARGETS	FSE	Active priority targets
FS_FSCM	FSE	Fire support coordination measures currently in effect
ENG_OBSTPLAN	Engr	Planned obstacles
ENG_OBSTEXEC	Engr	Executed obstacles
ENG_SURVPLAN	Engr	Planned survivability construction
ENG_SURVEXE	Engr	Executed survivability construction
DTSS (doporsh1)	Engr	DTSS Overlay Provider
CSS_ROUTES	S4	All supply routes
CSS_POINTS	S4	Ammunition supply points, ammunition transfer points, aid stations, Ambulance Exchange Points (AXP), unit maintenance collection points, logistics release points, refuel on the move locations, forward arming and refueling points, enemy prisoner of war collection points, refugee collection points, engineer supply points, supply points (Class I, III, V, VII, VIII, IX)
CSS_SPTAREAS	S4	task force support areas, brigade support area, division support area
NBC_DECON/AREAS	CHEMO	Decontamination sites, NBC contaminated areas,

* Or comparable staff section at division/corps/EAC

Table 5-5 (continued). Sample Notional Overlays

5-8 Naming Convention for Static (Notional) Overlays

The COP includes a large number of notional overlays developed by different individuals and staff sections. Moreover, they must be updated frequently in order to keep the COP current and useful. This means that careful management of these many overlays and their many changes is absolutely critical. A naming convention is therefore required for labeling each overlay and update. Procedures

for notifying COP users of these changes are also required. The naming convention should be stated in unit SOPs. An example system for labeling overlays is provided at Figure 5-2 and further explained at Table 5-6.

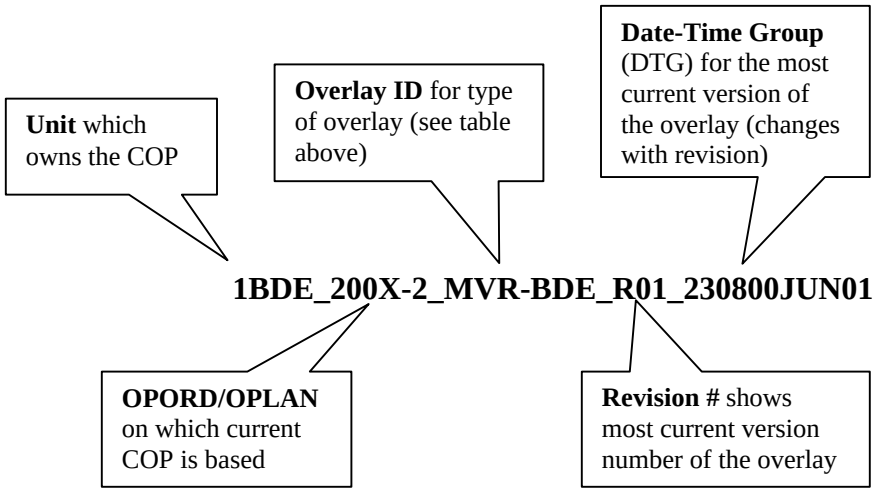


Figure 5-2. Naming Convention Example

Name Field	Field Example	Field Explanation
Unit	1BDE	This field shows the unit that owns the COP being developed. The unit name used must be the same for all overlays in the COP. This unit name should be established by unit SOP.
Order/ Plan/ Phase	200X-2	Show in this field is the name of the order or plan on which the current COP is based. The order/plan will be named in accordance with unit SOP. See OPORD/FRAGO/OPLAN for naming. This field can also describe the phase of operation (i.e., MTA or PH2).

Table 5-6. Naming Convention Explanation

Overlay ID	MVR_BDE	Identify here the type of overlay being named. Examples for the ID are found in the above table under the Overlay IDs column.
Revision #	R01	This field shows the most current version of the overlay. The initial version of the overlay is labeled "R01." Every time the overlay is revised, assign the next number (e.g., R02, R03).
DTG	230800JUN01	This field contains the date-time group (DTG) for the most current version of the overlay. When the Revision # (see above) is changed, the DTG of the overlay must be changed. Use the same time zone used in the operation (or the local time zone if an OPLAN).

Table 5-6 (continued). Naming Convention Explanation

5-9 Color Convention for Static (Notional) Overlays

As with overlay names, the composite picture formed by combined notional overlays from different sources will be confusing unless color is used in an orderly, consistent fashion. The unit must therefore institute standard usage of colors within the COP. Recommended and default colors for various graphics are provided below. These colors are consistent with Military Standard 2525B, page 40, Table XII and are supplemented where the default color is not sufficient for ready discrimination.

Recommended Colors
Division Graphics - Black
Brigade Graphics - Blue
Task Force Graphics - Light Blue
Airspace Control Orders - Light Blue
Signal Control Measures - Orange
Chemical - Yellow
FSCM - Same color as echelon graphics

Default Colors
Hostile Graphics - Red
Weapons Range Fan Graphics - Green
Sensor Range Fan Graphics - Blue
Obstacle Graphics - Green

5-10 Dynamic (CP) Overlays

The current CP picture provides the dynamic unit locations to the COP in near real time. The types and echelons of units depicted are determined by the filters selected by the operator in accordance with the commander's guidance. At Table 5-7 are examples of possible CP overlays. Each example lists the CP Picture name, the staff section responsible for preparing the overlay, and the units/echelons depicted in the overlay.

CP Picture	*Staff Section	**Picture Components
MVR	S3	Armor, infantry, and mortar platforms/units; task forces
AVN	S3	Rotary platforms/units
FS	FSE	Artillery units, fixed wing aircraft, MLRS platoons, counterfire radar, counterfire radar fan
ADA	ADO	ADA weapon platforms/units, ADA sensors, ADA sensor coverage
ENG	Engr	Engineer units
CHEM	N/A	(no element contained in COP Template at present)
MP	N/A	(no element contained in COP Template at present)
ENE_INTEL	S2	Known enemy maneuver platforms/units within security zone; known enemy maneuver units beyond security zone, artillery units
INTEL	S2	Scout platforms/units
SIG	S6	Signal nodes
CSS	S4	Ambulances
C2	S3	Division CPs, brigade CPs, battalion CPs, company CPs
Note: The Declutter Tool must be used in order to filter out units by echelon from the selected chart tab.		

* Or comparable staff section at division/corps/EAC
** Echelons depicted depend on CP echelon and tactical requirements

Table 5-7. Example CP Overlays

5-11 Distribution of Overlays

Through MCS, the S3 staff section is responsible for the management of the COP. This is done as described below.

To distribute *static* overlays *within* a CP, the MCS operator transmits a FTM, requesting that the staff forward their static overlays to the S3's MCS workstation. Each staff section completes the static overlay and distributes it back to the MCS using the Plan Manager application. Dynamic overlays are distributed among ATCCS BAS (i.e., MCS, ASAS, AFATDS, AMDPCS, and CSSCS) by Situational Awareness/Replication (S/R), Informix Enterprise Replicator (I-ER), and WDS (database replicator). Both static and dynamic overlays then enter each system JCDB.

To distribute *static* overlays *between* CPs, the MCS operator sends the overlay through the Web Based Plan Manager. For CP overlays, the overlay is sent via I-ER. The distributed overlay enters the other CP's MCS JCDB which is then posted to the Available Map Objects panel in the Overlay Explorer window in COP.

5-12 Detailed Input to COP

Table 5-8 on the next page describes in detail the types of information that comprise and contribute to the COP. The chart lists the information elements and those BAS with the capability to exchange (send/receive) those elements. While only a guideline, the listed information is likely to be highly relevant to the commander and staff in forming the COP. These inputs to the COP are of two types:

- Overlays and data displayed within the COP
- Reports that contribute to the display of information in the COP

Information Name	Applicable BAS	Description
Position Report	GCCS-A, FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A report that provides friendly unit location data, preferably by automatic data exchange.
Operations Overlay	GCCS-A, FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A graphical depiction of the OPORD showing units, boundaries, control measures, and so forth, in a digital color map display or analog overlay.
Enemy Overlay	GCCS-A, FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A graphical depiction of the location, size, and activity (past, current, or planned) of enemy units.
Obstacle Overlay	GCCS-A, FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A graphical depiction of locations of friendly and enemy obstacles, including information on key terrain, status of friendly obstacles or barriers (completed, executed, planned, prepared), enemy obstacles, enemy ground avenues of approach, and effective times of the obstacles if known.
Combined Obstacle Overlay	GCCS-A, FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A graphical depiction of terrain under dry, normal, or wet conditions that depicts mobility and cross-country movement rates for use in avenue of approach analysis. The overlay integrates all obstacles into a single display, greatly simplifying further avenue of approach and mobility corridor analyses.

Table 5-8. Information Comprising and Contributing to COP

Information Name	Applicable BAS	Description
Modified Combined Obstacle Overlay (MCOO)	GCCS-A, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A graphical depiction of the analysis results of the battlefield's effects on military operations. Based on a product depicting all obstacles to mobility, modified to also depict the following which is not prescriptive or inclusive: cross-country mobility classifications, objectives, and mobility corridors, likely locations of counter-mobility obstacle systems, defensible terrain, likely engagement areas and key terrain.
Fire Support Overlay	GCCS-A, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A graphical depiction of FS coordinating measure text and graphics, locations of friendly artillery, mortar, and FS assets, areas that can be supported by FS weapons, areas that can be covered by FS sensors, radar, or observers, and ammunition supply points.
Air Space Coordination Overlay	GCCS-A, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A graphical depiction of the lateral boundaries of the airspace control area, low-level transit routes, high-density airspace control zones, aircraft checkpoints, and standard Army aircraft flight zones.
CSS Overlay	GCCS-A, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A map overlay that shows the current location of and mission information about CSS operations. It can include information such as logistics release points, supply points, operational times, supply routes, and operational graphics necessary to identify unit boundaries or other important control measures to include support area unit and facility locations, Combat Trains Command Post (CTCP) locations, locations of forward supply points for classes III, V, and IX, locations of Unit Maintenance Collection Points (UMCPs), locations of Maintenance Support Teams (MSTs), locations of current and projected Medical Transfer Facility (MTF), AXPs, and Casualty Collection Points (CCPs), locations of field services such as laundry,

Table 5-8 (continued). Information Comprising and Contributing to COP

Information Name	Applicable BAS	Description
CSS Overlay (continued)		bath, or graves registration, locations of major supply routes (MSRs) and Alternate Supply Routes (ASRs), and Standard Army Aviation Flight Routes (SAAFR).
Fire Plan Overlay	GCCS-A, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A graphical depiction of information used to control and integrate direct and indirect fires at company level and below. It depicts the location of planned targets; target reference points; dead space; final protective fires; engagement areas; sectors of fire; and primary, alternate, and subsequent firing positions.
Range Card	FBCB2, MCS	A graphical depiction of a range card that is normally developed for each defensive fighting position and includes: the left and right firing limits, dead zones (areas that cannot be engaged by the weapons in the fighting position), ranges to likely points that the enemy may use, best grazing fire lines, the final protective fire line. The range cards typically feed the platoon fire plan overlay.
Sector ID Overlay	FBCB2, MCS	A graphical depiction of defensive operations at company level and below to show division of responsibilities.
Traffic Control Overlay	GCCS-A, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A graphical depiction of the routes, locations, and size of depicted units. Visually depicts the physical relationships of units (represented by the overlay) and terrain (represented by the map).
NBC Overlay	GCCS-A, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A graphical depiction of the location of decontamination sites, reconnaissance sites and smoke operation lines.

Table 5-8 (continued). Information Comprising and Contributing to COP

Information Name	Applicable BAS	Description
Sensor Data	FBCB2, AFATDS, ASAS, AMDPCS	Intelligence obtained from information collected by sensors regarding enemy movements/activities and to support estimates of enemy capabilities and intentions. Used primarily for Joint Surveillance Attack Radar System (JSTARS) Moving Target Indicators (MTI)/Fixed Target Indicators (FTI), and secondary imagery.
NBC Reports	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	NBC 1 though NBC 6 reports. NBC attack data-initial (NBC 1). The NBC 1 report contains information provided by the observing unit that gives basic initial and follow-up data about an NBC attack. NBC evaluated data (NBC 2). The NBC 2 report contains information based on two or more NBC 1 reports to provide evaluated NBC data to units. NBC contamination-predicted (NBC 3). The NBC 3 report contains information provided to units detailing the predicted location and extent of NBC contamination. NBC-reconnaissance, monitoring, and survey (NBC 4). When a unit detects NBC hazards through monitoring, survey, or reconnaissance, this information is reported as an NBC 4 report. NBC-report of areas of contamination (NBC 5). Once NBC 4 reports are posted on the situation map, an NBC 5 report is prepared to show the contaminated area. NBC 5 reports are usually map overlays. NBC attack data-detailed (NBC 6). An NBC 6 report summarizes the results of an NBC attack.
Threat Warning	GCCS-A, FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A message notifying units, commanders, and personnel of an imminent ballistic missile, aircraft, or NBC attack.

Table 5-8 (continued). Information Comprising and Contributing to COP

Information Name	Applicable BAS	Description
Spot Report	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	The standard verbal or digital report giving information about known or suspected enemy activity, including observer designation and Size, Activity, Location, Unit, Time, and Equipment (SALUTE) data.
Obstacle Report	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A report giving obstacle type, location, impact on movement, bypass locations, safe corridors, and enemy activity near the obstacle. Platform through brigade levels
Minefield Report	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	Location and type of minefields employed by friendly forces. For minefields with automatic destruction capabilities, the time of destruction is also included.
Bridge Report	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A report that includes bridge, overpass, culvert, underpass, and tunnel data; location; entrance; exit; type; overall length; width of roadway; height restrictions; number of spans; length of spans; computed classification; bypass locations; and bypass conditions in the area of operations. It also reports or confirms the description and condition of a bridge to support trafficability or destruction.
SITREP	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	An informal report submitted by subordinate units on request or their own initiative to their higher HQ and adjacent units as necessary to report and define tactical situations and status.

Table 5-8 (continued). Information Comprising and Contributing to COP

Information Name	Applicable BAS	Description
Basic Weather Report	IMETS, MCS, AFATDS, ASAS, AMDPCS	The basic weather (WX) report provides current weather observations and forecasts at predetermined intervals. It includes the forecast weather conditions and light data for the next 24 and 48 hours. Specific information that will be included are: End Evening Nautical Twilight (EENT), Beginning of Morning Nautical Twilight (BMNT), sunrise time, sunset time, percent of illumination, moonrise, moonset, wind speed, wind direction, visibility, precipitation, temperature, ceiling, and barometric pressure, Chemical Downwind Message/Report (CDM/CDR), Effective Downwind Message/Downwind Report (EDM/EDR), and Basic Downwind Report (BDR)

Table 5-8 (continued). Information Comprising and Contributing to COP

5-13 The COP and the Operations Process

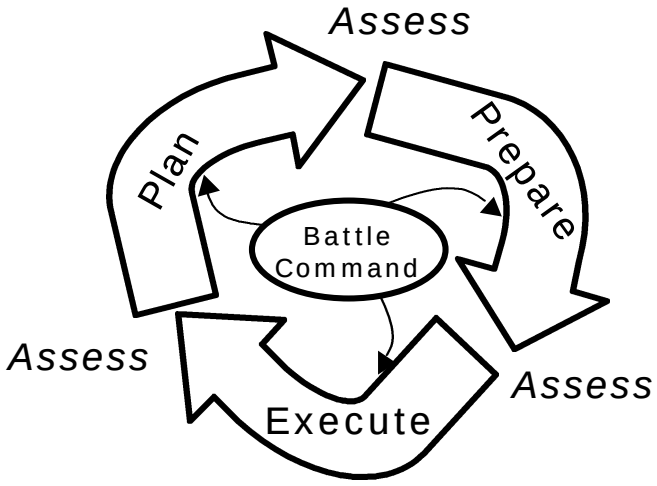


Figure 5-3. The Operations Process

By providing a clear, accurate, and common view of the battlespace in near real time, the COP is key to each step of the operations process - plan, prepare, execute, and assess (see Figure 5-3) - as summarized below.

Plan

- *Intent and Planning Guidance:* The commander can more readily impart his intent and issue planning guidance. The COP also helps to ensure a subordinate commander is himself planning within the intent and concept of operations of his own superior commander.

- *Relevant Information:* A commander can use the COP to depict his operational picture. This will help his staff and subordinate leaders focus on the relevant information for the operation. This will facilitate the planning process, resulting in more rapid planning and more precise understanding of and adherence to the commander's intent. SU of friendly forces is automatically fed into the COP. However, all other data must first be manually inputted into ABCS BASs before being automatically displayed, in turn, in the COP.
- *Collaboration:* Because leaders at different locations can simultaneously view the battlespace in an identical manner, collaboration is significantly enhanced, thereby facilitating planning, directing, and brief-backs. Staffs can use the same graphics and overlays (both active and notional) concurrently from different ABCS systems.
- *Parallel Planning:* The COP will help subordinate units conduct their own planning concurrent with the development of their parent headquarters' plans. See Chapter 6 for more information on this aspect of the COP.
- *Branches and Sequels:* Different configurations of the COP can be developed to match anticipated branches and sequels of an operation. As the tactical situation evolves, revisions to the original plan can be rapidly disseminated such as changed operational graphics.
- *Reduced Control Measures:* The increased SU attained through the COP might possibly reduce the need for extensive control measures to coordinate maneuver and to avoid friendly-on-friendly engagements. The will allow units to function more effectively should the battle become fluid and/or non-linear. This must be balanced, however, with the fact that you will never have perfect SU.

Prepare

- *Brief-backs:* Using the common framework provided by the COP, subordinate leader are better able to conform to the commander's intent and concept of operations. This common framework will also assist the subordinate in conveying his own plans during the brief-back.
- *Plan Updates*: Units can monitor the current tactical situation even as they ready themselves for an operation. Tactical plans and staff estimates can be revised as necessary to meet changes in the battlespace as seen through the COP. This is especially critical in a highly fluid tactical situation.
- *Rules of Engagement (ROE):* The COP can be used to depict certain parts of the ROE. This will help to ensure the ROE are disseminated uniformly down to the lowest echelons.

Execute

- *Adaptability:* Units can respond rapidly to the dictates of the evolving tactical situation during an operation. The shared SU increases the ability of commanders at all levels to quickly make the right decisions, synchronize their forces and fires, and increase the operational tempo.
- *Initiative:* Armed with the commander's intent and superior SU, subordinate leader's are better able to seize and retain the initiative within their respective tactical spheres. Units therefore will be better able to dictate the terms of combat in order to build momentum quickly and to win decisively.
- *Risk Management:* The commander will be better able to assess risk using the SU gained via the COP. This will enable him to act more aggressively while simultaneously enhancing the protection of his force.
- *Friendly-on-Friendly Engagements:* The enhanced SU gained through the COP combined with other C4ISR enhancements and improved optics will offer the opportunity to reduce the chance that friendly forces will become engaged with one another. This will contribute to force protection, rapid

engagement, and aggressive maneuver. This is, of course, contingent on the premise that all friendly forces involved have a full suite of fully operational ABCS.

- *Changes to Operations:* Using the COP, the commander can rapidly communicate changes to an ongoing operation. This might entail following a branch or sequel, changes to control measures, or even a new line of operations.

Assess

- *Monitoring Operations (or Battle Tracking):* The COP helps leaders to measure, analyze, and report unit performance during an operation. In turn, this enables them to compute or otherwise identify variance from the plan or its assumptions and to forecast change. Using the COP, staff sections can employ their respective BAS to monitor operations according to a common baseline to assess unit performance.
- A commander can help to satisfy his CCIRs by ensuring his requirements are depicted within the COP, as applicable. This will ensure staff and subordinates key on this information during an operation.
- *COP Maintenance:* The COP is not static but, instead, requires, continuous monitoring and revision, where appropriate. Factors that might indicate such changes include: success on the battlefield; changes in task organization; significant alteration to the enemy picture; change in mission; significant friendly losses; change in concept of operation; movement to a new phase of the joint campaign; and/or environmental changes or shifts (e.g., weather, civil disturbances, etc.). Such changes may be anticipated and, therefore, preplanned.

Notes

Notes

CHAPTER 6
MILITARY DECISIONMAKING PROCESS

Overview: This chapter describes the role of ABCS in supporting the Military Decisionmaking Process (MDMP). It addresses how to use digital systems and collaborative tools to develop plans in a time-constrained environment.

6-1 MDMP and Digitized Operations

In the digital environment, the MDMP will continue to form the basis for planning operations. The major steps of this process are listed at Table 6-1 along with an additional final step, Disseminate Orders. This step has been added because ABCS has a variety of tools to accomplish this task, thereby warranting special discussion.

MDMP Phases	Remarks
1. Mission Receipt	Issue commander's initial guidance and warning order
2. Mission Analysis	Approve restated mission. State commander's intent. Approve CCIR. Issue commander's guidance. Issue warning order.
3. COA Development	
4. COA Analysis	Wargaming
5. COA Comparison	
6. COA Approval	Specify type of order and rehearsal. Refine commander's intent. Issue warning order.
7. Produce Orders	Approve order
8. Disseminate Orders	(Added, non-doctrinal step to MDMP)

Table 6-1. Steps of the Military Decisionmaking Process

The MDMP was developed in large part to support the production of the detailed plans needed for C2 of complex organizations. In the past, detailed control measures were used to compensate for the "fog of war" about both the enemy and friendly situation. Friendly control measures, such as phase lines and checkpoints, were used to control and track the location of friendly units and their progress. Through ABCS, the commander is able to gain a high degree of SU. Friendly locations can be tracked down to the platform level with great accuracy. If a unit's ABCS is fully operational, the unit should be able to develop and issue orders containing fewer details given the decrease in uncertainly and associated risk within the battlespace. However, if ABCS is less than fully operational, it may be necessary to revert to analog procedures to include detailed orders. Using simple mission and intent orders can save valuable planning time, increase unit agility, and allow units more time to prepare. Soldiers at every level, however, will have to assess the picture that ABCS provides against their own SU. For example, a BAS or a signal node could stop working, causing inaccuracies in the picture of the battlespace. Personnel therefore must continuously confirm that this picture is accurate and, if necessary, employ analog systems to ensure an accurate view of the battlespace.

ABCS can also reduce planning time because of its ability to share information rapidly and accurately. Staff sections, especially planners, will have ready access to the latest situation information needed to conduct planning. However, C2 will transition from a plans focus to an execution focus with decisions being made on the move, throughout the battlespace, and in real and near real time. Knowing the commander’s intent is critical for success in such execution-focused operations.

While planning will continue in the same sequence, it may be conducted simultaneously at different stages at different echelons. In an analog environment, this was partially done through the issue of WARNOs which enabled subordinate units to anticipate and prepare for the mission. However, units were nevertheless highly dependent on their receipt of the final order.

ABCS will allow units to employ a distributed parallel planning process as shown at Figure 6-1.

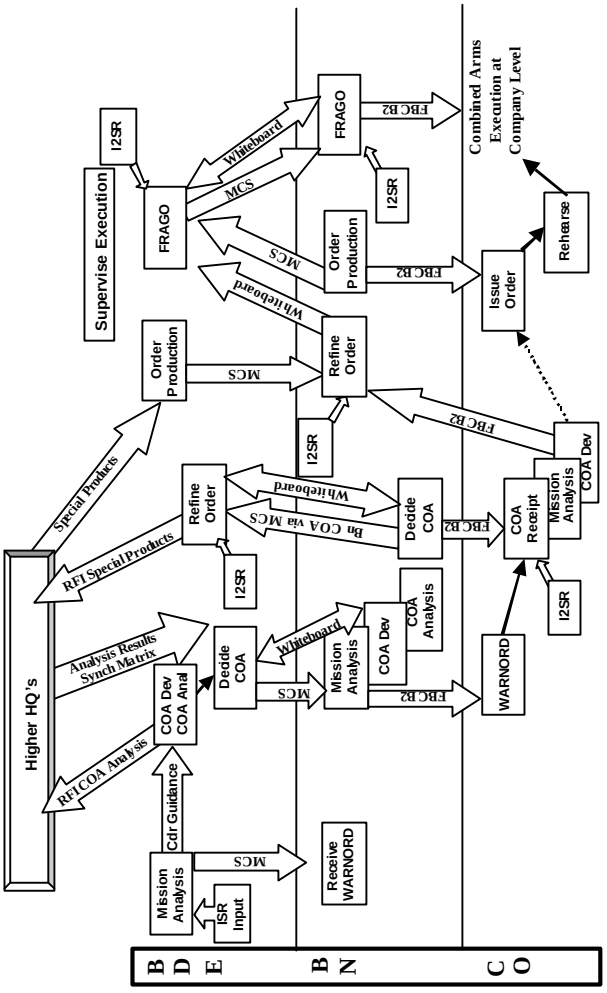


Figure 6-1. Distributed Parallel Planning Process

6-2 Collaborative Tools

The entire MDMP should be collaborative to best support the commander as he makes his decision. There are times, however, when a higher headquarters commander may not want to involve subordinate commanders if they are heavily engaged in an operation. Many different individuals and sections are involved in the MDMP, sharing information and ideas to develop the final products. The distributed parallel planning process is feasible because of ABCS' collaborative tools that enable commanders and staff at different echelons to closely coordinate their planning efforts. ABCS adds to the conventional modes of collaboration via telephone, radio, paper documents, or face-to-face using the tools listed at Table 6-2.

Collaborative Tool	Description
Large Screen Display (LSD)	When available, the LSD can be used to display SITTEMPs, COAs, and other graphics to help planners visualize the plan. Provides a common display for staff members to refer to during a discussion.
ABCS SunForum Tools	Used to collaborate between sections or CPs that are separated by some distance. The SunForum package also enables the ATTCS user to share an application with another station in a conference. When sharing in this fashion, one station can observe the application being used while the other station retains control. This feature is useful when necessary to show a specific screen to the commander or another staff member during a discussion
Web Pages	For posting information and data often needed by other individuals and staff sections. If terrain or weather data is needed, for example, first check the DTSS Maneuver Support Section or IMETS web page. Such web resources enable staff sections to collaborate without having to respond to specific requests for information.

Table 6-2. Tools Supporting Digital Collaboration

Collaborative Tool	Description
BVTC	Battlefield Video Teleconferencing (BVTC) is very useful for collaboration when available to the CP.
Chat	System users taking part in a chat can carry on a "conversation" in real time using text. All participants can read the messages posted by other participants.
FBCB2	This BAS can be used to show simple graphics for discussion. It allows the collaborating individuals to conduct a discussion while viewing the same display on their systems. However, complex graphics and long text messages are not easily passed from one BAS to another, especially if one of them is FBCB2.

Table 6-2 (continued). Tools Supporting Digital Collaboration

6-3 BAS Input to MDMP

Individual BASs of ABCS provide input to the MDMP in the major areas listed at Table 6-3. This includes key inputs to the JCDB. ISYSCON is also key in order to manage the network effectively. The BAS' role in the MDMP is described in further detail in subsequent sections.

BAS	Products for MDMP
GCCS-A	Higher headquarters products
MCS	Plans and orders, UTOs, reports
ASAS	Enemy overlays and IPB, secondary imagery, intelligence summary, enemy locations, enemy geometries
AFATDS	Fire support overlays, fire unit locations, range fans, target locations, radar and observer locations
AMDPCS	ADA overlays, sensor coverage, weapon coverage, air picture

Table 6-3. BAS Products Supporting MDMP

BAS	Products for MDMP
CSSCS	Logistics and personnel overlays, BRIL/CTIL, CSSCS Status Report, CSSCS Capability Report
FBCB2	SU, orders, and reports
TAIS	Airspace control measures
DTSS	Terrain overlays, local terrain, trafficability
IMETS	Weather overlays, weather effects matrix, battle scale forecast model
ISYSCON	Network management

Table 6-3 (continued). BAS Products Supporting MDMP

6-4 Mission Receipt

MDMP begins with the receipt or anticipation of a new mission as outlined at Table 6-4. Each step during Receive the Mission is supported by ABCS as shown at this table.

Steps in Phase	ABCS BAS	Collaboration
1. Receive or Anticipate/Deduce Mission	Receive: MCS orders and products Anticipate/Deduce: COP	Mission receipt (COP, whiteboard, chat, BVTC)
2. Issue a Warning Order to Staff Personnel	Internal: voice External: MCS/FBCB2 WARNO to rear CP and others	Mission clarification Warning order to subordinate and supporting units

Table 6-4. ABCS Support to Receive the Mission

Steps in Phase	ABCS BAS	Collaboration
3. Gather the Tools Needed to Do the Mission Analysis	MS Office/Star Office products: update/complete templates for staff estimates ASAS: download higher intelligence products DTSS & IMETS: initiate analysis	
4. Determine Initial Timelines	MCS: record timeline Homepages: post timeline	
5. Issue Initial Commander's Guidance	MCS: record & send to rear CP Homepages: post guidance summary	
6. Issue a Warning Order to Subordinate and Supporting Units	MCS/CMP/FBCB2: post and/or send WARNO ASAS: post and/or send higher intelligence products DTSS: post and/or send digital terrain data of AO IMETS: post and/or send meteorological data for duration of mission	

Table 6-4 (continued). ABCS Support to Receive the Mission

Step 1 - Receive or Anticipate/Deduce Mission: The receipt may be the result of an order from a higher headquarters or the identification of an unanticipated opportunity or challenge on the battlefield. Some new missions will arrive as

messages. This will typically be preceded by a series of WARNOs. The message may direct the unit to download or "pull" an OPORD or FRAGO from an FTP site. It may even be a voice message issuing a WARNO from the next higher headquarters. A WARNO, FRAGO, or OPORD will normally cause the staff to assess the mission and begin planning. If a unit is directed to download an order, it must also be told the file's exact name and location on the higher headquarters' server. Graphics and text can usually and readily be downloaded down to battalion level. Only relatively simple graphics and limited text can be pushed to the company level due to the limitations of FBCB2 as described in Chapter 3. The staff or the commander may also discern from their SU and/or the COP a situation that necessitates a change to the current plan or operation. The change represents a new mission.

Step 2 - Issue a Warning Order to Staff Personnel: Next, a WARNO is issued to the staff alerting everyone of the initiation of MDMP. Within the CP, this alert is by voice. Other elements (such as the rear CP and key planning personnel) need to be recalled or placed in a collaborative planning role. This can be done via radio or MCS and/or FBCB2 messages.

Step 3 - Gather the Tools Needed to Do the Mission Analysis: At this step, the staff prepares by gathering the tools needed for mission analysis. This may include updating estimates, pulling products from higher headquarters, and initiating analyses using DTSS and IMETS. Staff estimates, found on the section web pages, should be immediately updated (however, these already should be relatively current as they should constantly be maintained so that current data is always available). Unit status reports can be pulled from subordinates, although this may not be necessary depending on the time since the last report. DTSS will frequently be one of the first accessed systems to ensure availability of map coverage for the area of operations. DTSS also gives access to data to support focused IPB. Intelligence personnel will check IPB products and start updating them as needed. If necessary, specialized information such as satellite imagery may be accessed from other sources. It may be possible to access the IPB

products from the higher headquarters that were used to produce their order. The signal officer and his network planners will also initiate network planning using ISYSCON.

Steps 4 - Determine Initial Timelines/Step 5 - Issue Initial Commander's Guidance: MCS can be used to record and the Commander's Homepage to post this information. This is essential during distributed planning (i.e., when it is performed in more than one location as will normally be the case).

Step 6 - Issue a Warning Order to Subordinate and Supporting Units: In this final step, the WARNO is prepared and sent primarily using MCS. However, the CMP on any system can also be used. The WARNO should be posted to the homepage along with any initial products available to facilitate planning by subordinates.

Collaboration: The mission receipt steps above are not aligned with the collaboration tools since collaboration needs will vary significantly every time MDMP takes place. Likely tools are listed. Moreover, some missions will be received during collaborative sessions. There may be some occasions when a commander or staff officer will need to clarify a point related to an order. Under these circumstances, the receiving staff may initiate a chat or other collaborative session. The WARNO may be disseminated using normal messaging capabilities or in a collaborative session. Using a collaborative session enables the staff to receive immediate input from subordinate and supporting units.

6-4 Mission Analysis

As the staff gathers information to aid in the planning process, it begins the process of mission analysis to identify the implications of the new mission as shown at Table 6-5.

Steps in Phase	ABCS BAS	Collaboration
1. Analyze Higher Order	Review MS/Star Office products and CTP operational and SU overlays	
2. Conduct Initial IPB	ASAS: develop IPB DTSS: provide IPB products IMETS: provide IPB products Intelligence reachback: data mining	Mission analysis briefing Commander's guidance Initial intelligence collection plan IPB product distribution
3. Determine Specified, Implied & Essential Tasks	MCS: record - post to homepage	
4. Review Available Assets	MCS: review UTO & CSSCS assets CSSCS: forecast personnel/logistics	WARNO to subordinate and supporting units
5. Determine Constraints	ISYSCON: determine signal constraints MCS: record - post to homepage TAIS: ACM display	
6. Identify Critical Facts & Assumptions	MCS: record - post to homepage	
7. Conduct Risk Assessment	MCS: record - post to homepage	
8. Determine Initial CCIR	MCS: Plan Manager; Information Tracker: record - post to homepage MS Office/Star: review products	
9. Prepare Initial Recon Annex	ASAS: develop annex MCS: ISR taskings	

Table 6-5. ABCS Support to Mission Analysis

Steps in Phase	ABCS BAS	Collaboration
10. Plan Use of Available Time	MCS: record - post to homepage	
11. Write the Restated Mission	MCS: record - post to homepage MCS: OPLAN/OPORD Tool	
12. Mission Analysis Briefing	MCS: UTO, operational overlays CSSCS: web page DTSS: products MS/Star Office: products CTP: Operational overlay LSD: update briefing	
13. Approve Restated Mission	MCS: record - post to homepage	
14. Develop the Initial Commander's Intent	MCS: record - post to homepage	
15. Issue Commander's Guidance	MCS: record - post to homepage	
16. Issue Warning Order	MCS/CMP: issue WARNO - post to homepage	
17. Review Facts and Assumptions	MCS: record - post to homepage	

Table 6-5 (continued). ABCS Support to Mission Analysis

Step 1 - Analyze Higher Order: In Step 1, BAS retrieve products from higher headquarter's home pages to assist the analysis. The electronic review capabilities of Microsoft Office products assist the analysis using features such as word search and highlighting.

Step 2 - Conduct Initial IPB: Intelligence will use ASAS, DTSS, IMETS, and reachback capability. For example, an updated MCOO can be obtained from the DTSS at the brigade main CP. DTSS can provide terrain data including trafficability, slope analysis, intervisibility lines, and GO-NO GO analysis. Weather forecasts, including the operational impacts of the weather in the area of operations, can be obtained from the IMETS which is also supporting the brigade. Terrain analysis can include the anticipated effects of forecasted rain using data from DTSS and IMETS. These products can be posted on web pages by the staff section, making them available to commanders and staff sections with browser capability and access to the network.

Step 3 - Determine Specified, Implied & Essential Tasks/Step 4 - Review Available Assets: ABCS provides much information to support this step. The status of personnel and equipment can be drawn from the unit status reports. The critical items of equipment are automatically tracked based on the CTIL, and the CSSCS can provide their status. The UTO tool can show what forces are available. The results of each step can be recorded on MCS and posted to home pages.

Step 5 - Determine Constraints/Step 6 - Identify Critical Facts & Assumptions/Step 7 ¾ Conduct Risk Assessment: In these steps, information is used that was gathered in earlier steps. Constraints on operations imposed by existing/planned ACMs should also be identified using TAIS. In most instances, the information can be recorded in MCS and posted to the home page.

Step 8 - Determine Initial CCIR: During this step, the higher commander's CCIR is analyzed while developing the initial CCIR to be recommended to the commander. The initial CCIR recommendations can be recorded in MCS and posted to the home page.

Step 9 - Prepare Initial Recon Annex: The S2 and S3 will use ASAS and MCS to develop the initial recon annex. With the commander's approval, collectors may be retasked or ground reconnaissance elements tasked to immediately begin

intelligence collection for the new mission. The full power of ASAS, MCS, and DTSS will be used as required to complete this step.

Step 10 - Plan Use of Available Time/Step 11 - Write the Restated Mission: In these steps, results are recorded in MCS and posted on the unit's home page. Time can be saved by inputting the restated mission into the draft order using the OPLAN/OPORD Tool.

Step 12 - Mission Analysis Briefing: During this briefing, all of the ABCS tools will be used that are normally employed for an update briefing. However, it is possible that these tools may instead be required for C2, battle tracking, and reporting. When such conflicts occur, tool priorities must be established. This might result in the mission analysis briefing being conducted with reduced capabilities such as using any ABCS BAS instead of the LSD.

Step 13 - Approve Restated Mission/Step 14 - Develop the Initial Commander's Intent/Step 15 - Issue Commander's Guidance/Step 16 - Issue Warning Order/Step 17 - Review Facts and Assumptions: These final five steps primarily are for recording and posting information to the unit home page. The major exception is Step 16 which is the S3's responsibility supported by other staff elements, as required.

Collaboration: Frequently, the commander will be out of the CP when a mission is being analyzed. The collaborative tools in ABCS permit the staff to provide updates and obtain the commander’s guidance at almost any time or location. For example, the mission analysis briefing can be conducted using a whiteboard or shared application session in conjunction with FM radio to provide voice communications. Similarly, the commander can issue guidance to the staff in a collaborative session. The WARNO can be transmitted electronically and can contain or be linked to many of the intelligence and supporting products used already. For example, IPB products can be posted for use by subordinates to assist in updating their own IPB. Terrain and weather data must also be provided through the DTSS and IMETS.

6-5 Course of Action Development

After the commander has issued his guidance, the planners begin to develop COAs for analysis and comparison as summarized at Table 6-6.

Steps in Phase	ABCS BAS	Collaboration
1. Analyze Relative Combat Power	MCS: COA tool - force ratio calculator ASAS: SITTEMP CSSCS: Unit status	RFI to higher headquarters
2. Generate Options	MCS: COA tool DTSS/IMETS: analysis tools	
3. Array Forces	MCS: COA tool, notional overlay, Plan Manager, force ratio calculator CSSCS: web page MS Office: PowerPoint (or Star Office conversion of PowerPoint)	Targeting inputs
4. Develop Scheme of Maneuver	MCS: COA tool, notional overlay TAIS: ACM display MS Office: PowerPoint (or Star Office conversion of PowerPoint)	COA briefing to commander
5. Assign Headquarters	MCS: UTO, COA tool, notional overlay MS Office: PowerPoint (or Star Office conversion of PowerPoint)	Commander's guidance
6. Prepare COA Statement & Sketch	MCS: COA tool, notional overlay MS/Star Office: products (including Star Office conversion of PowerPoint) ISYSCON: analyze COA for signal supportability	

Table 6-6. ABCS Support to Course of Action Development

Step 1 - Analyze Relative Combat Power: The tools shown above provide the capabilities to assist in determining relative combat power. The enemy data comes from ASAS, and much of the current friendly strength can be extracted from CSSCS. MCS provides the force ratio calculator.

Step 2 - Generate Options/Step 3 - Array Forces/Step 4 - Develop Scheme of Maneuver/Step 5 - Assign Headquarters/Step 6 - Prepare COA Statement and Sketch: For these steps, planners can use MCS to produce notional overlays (see Chapter 7) and to sketch out the COAs described by the commander. The S3 section can place information in the Plan Manager to hold the work as it progresses and to make the data available to other sections and elements conducting parallel planning. While not the optimal tool, PowerPoint can be used to develop COAs as a last resort. While ISYSCON will be used throughout the MDMP, analyses using this system will be critical in assessing whether a COA can be supported by signal assets. In Step 4, TAIS should be used to identify ACMs which will impact the scheme of maneuver.

Collaboration: Planners will be collaborating, discussing options, and getting ideas and inputs from many other sections and staff members. Additional Requests for Information (RFIs) may be sent to higher headquarters, especially for additional intelligence. The planning team will collaborate with the sections that do not have regular members on the team. The commander may receive the COA brief and provide his guidance using a collaborative session if he is not already present in the CP.

6-6 Course of Action Analysis

The next step in the planning process is to analyze each COA leading to the selection of one for execution per the summary at Table 6-7.

Steps in Phase	ABCS BAS	Collaboration
1. Gather the Tools		RFIs Post COAs to web for subordinate review/input
2. List Friendly Forces	MCS: UTO CSSCS: Status and CTIL	
3. Assumptions	MCS: record	
4. Critical Events and Decision Points	MCS: information Tracker	
5. Evaluation Criteria	MCS: record	
6. Select Wargame Method	MCS: record	
7. Select Recording Method	MCS: record	
8. Wargame	MCS: COA Tool CSSCS: COA Tool AFATDS: COA Tool MCS: record ISYSCON: network analysis tools	
9. Assess Results	MCS: modify and record	

Table 6-7. ABCS Support to Course of Action Analysis

Step 1 - Gather the Tools/Step 2 - List Friendly Forces/Step 3 - Assumptions/Step 4 - Critical Events and Decision Points/Step 5 - Evaluation Criteria/Step 6 - Select Wargame Method/Step 7 - Select Recording Method:

While the COA analysis sub-steps are primarily conceptual tasks, several digital tools are available to assist in the process to include recording results in MCS.

Step 8 - Wargame/Step 9 - Assess Results: In addition to using the maps, overlays, and COA statements to visualize the COA, there are CSSCS and AFATDS COA tools. The CSSCS COA analysis tool forecasts the ammunition and the major equipment status of the unit for up to a five-day period for up to three COAs. AFATDS can analyze and compare multiple COAs and determine approximate expenditure requirements based on the numbers and types of anticipated targets, level of destruction desired, and availability of systems. ISYSCON is used to conduct network analysis for each COA. It is during the analysis step that the evaluation criteria are determined. These criteria are used to measure the effectiveness and efficiency of one COA relative to another. It is critical that all sections use the same criteria in making their evaluations. This consistency enables the analysis results to be compared in a later step. The COA tool is intended to assist in the wargaming by enabling the planners to animate the COAs and wargame them in order to gain insight into the possible moves and countermoves of each side. PowerPoint may be used to support this step when it is the only option.

Collaboration: This part of the MDMP entails little collaboration between CPs. However, there will be exceptions requiring collaboration capabilities to solve problems through sharing of information and ideas. Collaboration that may occur during this step may involve sending RFIs, receiving responses and, in discussion between sections, clarifying portions of the COA. This can be facilitated by posting the COA sketches to the S3 website or to a shared folder that each section can then access and provide feedback.

6-7 Course of Action Comparison

There are only a few tools specifically designed to assist the staff in making their judgments of the relative strengths and weakness of the COAs under comparison. Those applicable are as shown at Table 6-8.

Steps in Phase	ABCS BAS	Collaboration
1. Post Criteria Matrix	MCS: record	Consolidated decision matrix ISYSCON
2. Weight Criteria	MCS: record - post to homepage	
3. Evaluate COA Strengths & Weaknesses	MCS: record - post to homepage CSSCS: Compare COA	
4. Consider Staff Estimates	MCS: retrieve/review operations estimate ASAS: retrieve/review intelligence estimate CSSCS: retrieve/review personnel and logistics estimates	

Table 6-8. ABCS Support to Course of Action Comparison

Step 1 - Post Criteria Matrix/Step 2 - Weight Criteria/Step 3 - Evaluate COA Strengths & Weaknesses/Step 4 - Consider Staff Estimates: The CSSCS COA tool can compare up to three COAs developed during COA analysis in terms of logistics supportability. The S3 may prepare a comparison matrix shell for each staff section to use. This shell can be placed in a shared file or on the section web page to ensure all sections use the same criteria. For example, an Excel spreadsheet from the included office package would enable the staff to rapidly enter data from their own analyses and for that data to be consolidated. This method provides consistency and ease of consolidation. It does require some time to build the shell and to enter the criteria. For each step, MCS is available to record information that is posted on the home page.

Collaboration: Collaboration is possible at this step by using the ability to share files such as a consolidated decision matrix. Additionally, if questions arise

concerning the input from a section, a chat or some other type of collaborative session can be arranged to resolve the issue.

6-8 Course of Action Approval

Applicable digital tools for this part of the MDMP are at Table 6-9.

Steps in Phase	ABCS BAS	Collaboration
1. Commander's Decision Briefing	MCS: maps and overlays CSSCS: web page MS/Star Office: products (including Star Office conversion of PowerPoint)	Approval briefing to commander Commander's guidance Post draft plan, overlay, & subordinate unit tasks to web LSD: briefing system
2. Refine Commander's Intent	MCS: record - post to homepage	
3. Specify Type of Rehearsals	MCS: record - post to homepage	
4. Specify Type of Order	MCS: record - post to homepage	
5. Issue Warning Order	MCS/CMP/FBCB2: develop and send WARNO	Whiteboard/shared application with subordinates WARNO to subordinates

Table 6-9. ABCS Support to Course of Action Approval

Step 1 - Commander's Decision Briefing: COA approval begins with the decision briefing to the commander. All the tools used for update briefings and the mission analysis briefing are available.

Step 2 - Refine Commander's Intent/Step 3 - Specify Type of Rehearsals/Step 4 - Specify Type of Order: In these steps, the main action is the recording of the commander's decisions. MCS serves to perform this function and to post the information on the homepage. Regarding Step 3, collaborative tools might be used in conducting digital rehearsals. For example, the S2 and ISR cells could conduct a Reconnaissance and Surveillance (R&S) plan rehearsal using the whiteboard and chat capabilities.

Step 5 - Issue Warning Order: The final step is the development and issuance of another WARNO that announces the commander's decision. This order provides significant details that allow subordinate leaders to continue detailed planning before receipt of the order.

Collaboration: The collaborative capabilities of ABCS enable the commander to receive this briefing even in remote locations. Although the bandwidth may not support the capability to transmit animations, the briefing can be conducted sending the file(s) to the commander, then using a voice system or chat to discuss key points. The commander can provide revised guidance or necessary adjustments to the COA using the same methods. If possible, subordinate commanders or their CPs may be linked into this "briefing" to receive early guidance from the commander to assist in refining or finalizing their own plans. If it is not possible or desirable to bring all the subordinate elements into collaboration for the approval briefing, it is still possible to use collaborative tools to disseminate the results. The staff can post the approved COA sketch and description on the Commander's Update Page for access by the staff and subordinate units. The commander may choose to host a collaborative whiteboard session with subordinate commanders to explain his intent and vision of the battlefield. The staff prepares and disseminates another WARNO to subordinates and supporting elements to enable them to refine and complete their own plans.

6-9 Produce Orders

Once the commander has approved the COA and issued his final guidance, the staff completes the plan and prepares to issue the order using the tools shown at Table 6-10.

Steps in Phase	ABCS BAS	Collaboration
Develop Order, Annexes, and Products	MCS: OPLAN/OPORD Tool - develop base order and overlays BAS: develop annexes and overlays MS/Star Office: products	Commander's Update Page Whiteboard session with subordinates

Table 6-10. ABCS Support to Produce Orders

Develop Order, Annexes, and Products: ABCS offers significant capability to accomplish this part of the MDMP. Desktop publishing functions and access to templates and electronic references during the orders production process are significant advances over analogue methods. The primary tools are the OPLAN/OPORD Tool in MCS and the Microsoft Office products on all systems. Additionally, once the order, annexes, overlays, and products are finished and approved, they are posted to the home page. An order in its final form must never be posted until approved by the commander.

Collaboration: Limited collaboration may occur while the S3 is producing the order in its final form. During this time, the S3 may access the Commander's Update Page of subordinate units to check their current status and staff estimates. Also, an S3 section may check its superior unit's update page for additional information to assist in parallel planning. While the staff is preparing the final version of the order for dissemination, subordinates are refining their own plans

based on the latest guidance received from the commander. Throughout the process, the S3 receives feedback from subordinates relative to their own plans and ideas. When appropriate, a whiteboard session can be initiated to clarify the commander's intent or to review subordinate plans and ideas.

6-10 Disseminate Orders

While this is not a formal step in MDMP, it is an essential one. The dissemination of orders is supported by ABCS as per Table 6-11.

Steps in Phase	ABCS BAS	Collaboration
Disseminate Order *(not a doctrinal step, but critical to ABCS)*	MCS: Plan Manager; post order, overlays, and products to homepage / send order, overlays, and products - notify units that the order has been posted to homepage Commander's Update Page: post order, overlays, and products FBCB2: Transmit order and overlays MS/Star Office: products	Receipt verification Subordinate unit briefbacks Whiteboard session with subordinates ISYSCON

Table 6-11. ABCS Support to Disseminate Orders

Disseminate Order: The unit will send sending messages and post products to its home page so that superior and subordinate units can access the order. Superior/subordinate units must also be notified that the order has been sent and posted to the unit web page. This notification will ordinarily take place via FM radio.

Orders can be disseminated using either a “PUSH” and “PULL” procedure. PUSH refers to when the CP sends the order to another element by positive action. For example, the operator has actually packaged the order and told the system to send it to the other station. The PUSH system is the only way for orders information to reach elements equipped with the FBCB2. The PULL system means that the elements receiving the order are notified that the order is available and where it could be found (what file). It is then the responsibility of that element to download the order. This system can be used between brigade and battalion headquarters because they have the browsers needed to locate the files. The battalion can access the brigade files and download the files containing the brigade orders and overlays, simplifying the job of producing their subsequent orders.

Subordinate units also may be able to pull information and orders from the Commander’s Update Page of the higher headquarters. Where an order has been disseminated but is awaiting an order to execute, the execution order may be sent verbally. Alternatively, it may be sent by message using the CMP. Any orders sent via or to FBCB2 must be kept simple to prevent overloading the device. FBCB2 cannot PULL information from a site because it does not have a browser capability.

Collaboration: Collaboration as it relates to orders dissemination normally is limited to ensuring the unit has received the complete order in an understandable form. In cases where the whiteboard is used to create and disseminate a FRAGO, there is little need to verify receipt. However, a follow-up written FRAGO to confirm the whiteboard discussion must be disseminated and its receipt acknowledged. There are three main methods for this acknowledgement:

- Machine Acknowledge (MA) - The receiving system transmits an automatic response to the sending system when the message is received.
- Operator Acknowledge (OA) - The receiving system transmits an automatic response to the sending system when the message is opened.

- Operator Response (OR) - The operator is required to indicate compliance and give a short written response. The message cannot be closed and the operator cannot go to another screen until he has sent a response back.

SOPs must specify how orders are to be disseminated and acknowledged to ensure all headquarters receive the needed information.

Backbriefs are another form of collaboration. Part of the purpose of a backbrief is to verify receipt and understanding. The subordinate unit can use the whiteboard to backbrief its superior unit on the plan.

The last collaboration tool is ISYSCON. Signal personnel use ISYSCON to pass and coordinate signal orders and network management guidance.

Notes

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CHAPTER 7
ABCS TRAINING MANAGEMENT AND RESOURCES PROCESS

Overview: This chapter provides the commander with a Digital Training Strategy for battalion and brigade.

7-1 Digital Training Principles

- Adherence to Field Manual 25-100 and 25-101
- Battle staff training can no longer be assumed or conducted in the background. It must be prescriptive in nature
- Digital unit commanders must continue to commit to being personally involved in the preparation, conduct, and evaluation of all training
- Commanders must conduct their assessment of training level on digital systems, relying on feedback from staff members and "digital master gunners"
- Long range planning must take into consideration the incorporation of new ABCS-related software drops and the need for delta training
- Short range planning must define in greater detail the broad guidance in the long-range plan. Continuous liaison with the PEO C(T)3 community is imperative to stay abreast of technological changes that will affect training plans in the digital environment
- Leader training up front with a stabilized leadership team
- Modular training to create flexibility (short and near-term training)

- Phased training to facilitate doctrine development, equipment arrival, and training support (incorporate into long and short range training plans)
- Start training when equipment is delivered and when it can be integrated into the unit training schedule
- Build on developmental training
- Include sustainment training in leader skills, special skills, and digital skills
- Practice with higher, lower, and adjacent C2 links
- Use of final coordinating drafts of skill manuals and Mission Training Plans (MTPs)
- The use of training meetings is critical due to unforeseen ABCS hardware and software changes. These events will cause a ripple in the short and near term plans
- AARs as stated in FM 25-101, Appendix G, are essential to linking digital lessons learned to subsequent training
- Live training in the digital unit remains the cornerstone, but commanders must enhance it by the use of distance learning products, and virtual and constructive training

7-2 Digital Training Strategy

A unit training concept follows the model recommended by TRADOC. This model consists of five progressive training levels as described at Table 7-1:

Level	Description
Level I	Individual Training
Level II	Section/Cell Staff Team Training
Level III	Battle Staff Training
Level IV	Functional CP Training
Level V	Full CP Training

Table 7-1 Training Levels

7-3 Categories of Individual Training

Most personnel will receive some form of ABCS/C4ISR training appropriate to their duty position. This requires the unit to identify, train, employ and, where possible, stabilize key operators, leaders, and trainers. This is where the soldier learns the basic software functionality, capabilities and limitations. This training includes all individual tasks that can be taught in a classroom environment without communication or simulation support. Soldiers and leaders are expected to master software functionality and the application of ABCS to CP operations during this phase so that the time required for ABCS NET on the tactical systems can be significantly reduced. This training forms the baseline for all soldiers whose duty assignments are affected by the ABCS systems and is tailored to show the "big picture" of how all systems work together to attain information dominance. Individual ABCS application training is provided in a classroom environment supported with commercial surrogate computers. This training is supported by instructors provided by Program Managers (PMs), proponents, established New Equipment Training Teams (NETTs), and/or by trained Instructors and Key Personnel (IKPs).

ABCS Overview and Individual ABCS Application training corresponds to Level I (Table 7-1) training of the TRADOC Digital Training Model. This enables soldiers to better employ their own applications by understanding how their systems function and how they support ABCS, command and staff operations, and warfighting.

This training falls into five categories:

- Awareness
- System Operator
- ABCS Information Integrator
- Battle Command Decision-Maker
- Signal and Maintainer

This training structure is depicted at Figure 7-2.

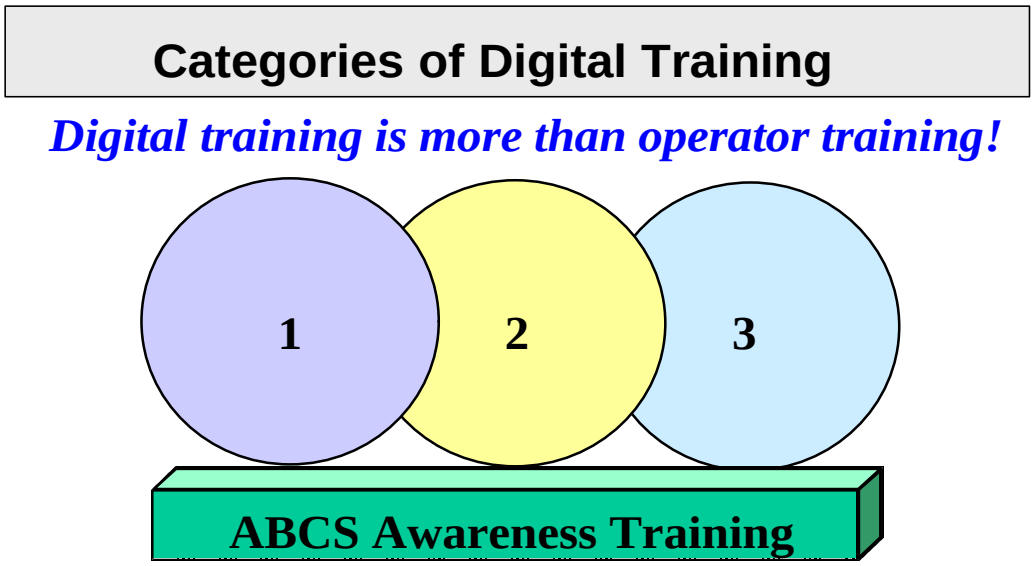

Figure 7-2. Categories of Digital Training

ABCS Awareness Training

This gives users a very general knowledge of ABCS. Awareness reflects the need for individuals to have enough knowledge of ABCS that allow him or her to understand how the system is used to connect with the other systems. After awareness training, all individuals should be familiar with:

- The systems that support the battle command system
- What the information is and how it is provided to them
- How the information is entered into, used, and passed through command channels

System Operator

An operator is a soldier who employs the specific software functionality of one of the battle command systems. Duties typically include data entry, display control, and system operation to accomplish specific assigned tasks. Skills include keyboarding, pointing/clicking, and navigating in and through a common user interface for Command, Control, Communications, Computers, and Intelligence (C4I) application programs. This category of personnel also includes support personnel requiring operator level skills.

Operator training focuses on the operation of the individual's assigned system. This requires the operator to acquire expertise in all data entry and output control functions for that system. Operators must be able to place their systems into operation, access all software functions, and maintain and configure their hardware. While this training will focus on a specific system, operators must also receive instruction to enable them to understand how their assigned system functions as part of the ABCS system of systems.

ABCS Information Integrator

The information integrator equates to the battle captain and battle staff NCO. The information integrator uses the information from the ABCS systems (and applicable non-ABCS digital systems) within the CP to assist planning, monitor the battle, and support the commander's decisionmaking. There are two conceptual types of information integrators - those who focus their activities around a single ABCS component system and those who integrate information across multiple systems. For example, the fire support NCO supervising an

AFATDS operator uses the system's capabilities to carry out his specific fire support function. On the other hand, the operations battle captain for instance is frequently required to integrate the information flowing from multiple systems within the CP.

Requisite training equates to battle staff training for NCOs and officers. Both types of integrators must have a working knowledge of the information-processing capabilities of the primary system supporting their staff section. They must also know how to access and integrate information from several systems in the CP into a coherent picture. This requires information integrators to understand fully the ABCS systems of systems and how they work together to support decisionmaking.

ABCS Battle Command Decisionmaker

This category of user includes senior NCOs, staff officers, and commanders who exercise analystic skills and whose focus spans the entire unit with all its capabilities and functions. The decisionmaker's sphere of interest and responsibility increases with rank and echelon and is also influenced by changing roles. He maximizes the operational capabilities of ABCS and optimizes bandwidth to meet his command and control and informational needs.

Training for decisionmakers is necessarily highly conceptual and retains a collective focus. The decisionmaker must be familiar with the general capabilities of the ABCS and supporting systems and understand how they fit together to give him information and to exercise command and control. Additionally, skills and experience with a system and across systems will give a decisionmaker the ability to intuitively sense whether data sets (and the conclusions based on it) meet the test of reasonableness. Decisionmakers must also develop an understanding of digital technology and its limitations. A commander who does not understand the essential technology underlying his digital systems. For example, if a decisionmaker does not understand ABCS' nnectivity requirements, he may issue orders that are not feasible to execute or are even counterproductive. Moreover, a

commander with minimal technical knowledge may find it difficult to manage the transition from analog to digital operations.

Maintainer Training
This category of training applies to the signal support personnel maintaining the C4ISR systems.

7-4 Commonly Used Digital Training Terms

Instructor and Key Personnel (IKP)
As NET is intended only to support the initial fielding of ABCS withina unit, it is essential for the unit to establish its own organic instructional capability using personnel skilled in digital instruction and training management. In turn, these digital "master gunners" will constitute the unit digital cadre, serving as SMEs for training other personnel directly, advising other trainers, and helping to develop and maintain the unit's digital training capability.

New Personnel
Reassignment of personnel into, within, and from the unit will necessitate changes to the digital battle roster. This turbulence requires the unit to closely monitor personnel and their training status in order to maintain unit digital proficiency on all BASs. Schedule new personnel for ongoing NET whenever possible. Alternatively, IKPs should conduct this training within units using NET instructional materials (lesson plans, programs of instruction [POIs], practical exercises, etc.).

New Equipment Training
This training begins with the introduction of a new or modified tactical digital system into the unit. PMs provide NET to the unit on their respective BAS. Training integration teams will support this training as required. Following NET, digital training responsibility passes to the unit. This requires the unit to train the right IKPs and overcome unit turbulence in order to create an organic

instructional capability following NET. NET provides the basis for sustainment and institutional training. NETProducts will be developed IAW TRADOC standards before handed off to the unit.

NET will terminate:

- After the NET has provided the MACOM with an acceptable training capability, as coordinated with HQ TRADOC and approved by HQDA (DAMO-TR)
- When sufficient school trained personnel are provided to the MACOM to enable it to operate and maintain the modernized equipment

Delta Training

Delta training is training required by changes in software that call for skills not trained during NET. The development of the Objective Force concept, rapid evolution of information technology, and the spiral development of ABCS will frequently necessitate delta training. The unit schedules delta training, and the PMs are responsible for this training on their respective BASs, as required. This training may be provided for all users in a classroom or field environment (in the case of major changes) or for unit-designated instructor and key personnel (for less significant changes). It may also be provided in conjunction with updates to, and distribution of, software user's manuals or Techical Manuals (TMs). Once completed, delta training provides the basis for sustainment training for that version of software.

Sustainment Training

This is a joint effort by the MACOM, combat/training developer, material developer or provider. Upon completion of initial training, it is the commander's responsibility to sustain individual and unit training. This training is conducted to reinforce previous training, sustains proficiency, and/or regains eroded skills. PMs will support refresher training by providing copies of their instructional materials to the individual, to the unit, and to the proponent to provide a baseline

for training products. Integrating ABCS into routine garrison operations effectively accomplishes refresher training. Consider daily use of digital systems for administrative duties. Using CSSCS through FBCB2 is a great way to accomplish routine duties yet sustain digital skills. Daily personnel reports, supply requests, maintenance request, etc., can be done on the appropriate system. Once a week, consider requiring units to submit tactical reports. Briefings and routine reports can be prepared on the "Office Suite" within the systems. Trainers must think of creative means to continue to sustain these highly perishable skills. One routine to establish may be to use the office products daily and to train on common applications weekly; a multi-echelon, focused digital training event should be planned at least quarterly.

Digital Battle Rosters

Central to ABCS training and readiness is the digital battle roster. This roster assigns personnel by name to specific operator workstations to enable continuous unit digital operations. It is recommended that units identify a minimum of three operators per workstation: one on day shift, one on night shift, and one swing operator as backup. It is strongly recommended that units maintain such a roster, which lists duty positions, assigned shift and BAS, projected reassignment, and training status (or date of last training).

7-5 Training Products

Individual Training Products

Individual training products are modified as required by proponents in accordance with this strategy and the unique requirements of the unit. NET should follow a logical, progressive Program of Instruction (POI) and include comprehensive, leave-behind TSPs for use by IKPs to conduct refresher and new personnel training in their units. Diagnostics are an important part of these TSPs to ensure effective and efficient training. These products are the responsibility of the PMs. There is a computer/web based ABCS Awareness Training package for use in the institutions and field. This training is not task based and provides the user a

general overview of the ABCS and supporting systems. It provides an introduction to the TI and the various message formats available in the system.

Collective Training Products

A set of TSPs exists that support the digital training strategy described in this chapter. The TSPs involve unit instructor preparation. These products can be modified to the unit itself to support BAS and staff training. Collective TSPs address all required and available training support requirements so units can conduct training with limited preparation and coordination of external support.

ABCS Executive Overview CD-ROM

To supplement the face-to-face instruction of the executive overview described above, the PEOC3(T) community has produced a CD-ROM. This CD has stand-alone use as a leave-behind instructional package for units, for senior leader training, and in lieu of face-to-face instruction. The material covered in the overview should be incorporated into early phases of training to ensure all trainees are aware of the full scope of ABCS, its supporting systems, and their functionality.

ABCS Job Aids

Warrior T has produced several useful job aids that are integrated into the individual and collective TSPs. For a complete review of their training products, go to http://fioasat.hood.army.mil. To access Warrior-T Products Such as Job Aids, Smart Books, Mixed TTP and Digital Command and Control Rehearsal (DC2R) use “User ID: battle staff” and Password: “wttaskmap.” To access the Graphical Viewer (which provides a method to view collective-individual task linkage across BOS for battle staff tasks) use "User ID: wtguest" and "Password: betatest."

7-6 Training Execution

There are numerous proven digital training execution strategies. The method described below was developed over the course of years by representatives of all

TRADOC schools, ATSC, TPIO-ABCS, digital training SME's from the CTSF, Fort Hood, TX, and the Brigade Coordination Cell (BCC), Fort Lewis, WA. It provides a logical and progressive sequence complementing the TRADOC Digital Training Strategy.

Digital Company/Troop SIMEX

This is training designed to create conditions in which the company commander and his personnel can learn how to apply the functions of FBCB2 in the planning and execution of tactical missions. The training occurs in the Mission Support Training Facility (MSTF) and is supported by constructive simulations to create operational conditions. There is a classroom and simulation component to this training. The digital company lane training is required for infantry companies and reconnaissance troops. The training objective will be for the units to understand and practice commanding and controlling the company and synchronizing unit Critical Training Task List (CTTL) tasks and missions with FBCB2 in preparation for live training and battalion Command Post Exercises (CPXs).

Battalion/Brigade Staff Section and Battle Staff Training

This phase corresponds to Levels II and III of the TRADOC Digital Training Model (Table 7-1). Each battalion and the brigade staff conducts staff section and staff training. These exercises train the commander and the staff on how to employ digital systems during CP operations. This training initially includes a classroom environment where the concepts and technical aspects of collective tasks are explained. Training then progresses to demonstrations and a walkthrough of critical tasks, culminating in fully developed operational scenarios supported by constructive simulation. The TSPs for this training include diagnostic and AAR tools to ensure training is conducted according to standard.

Focused Multi-Echelon Training

This phase corresponds to Levels IV and V of the TRADOC Digital Training Model (Table 7-1). These training exercises are designed to isolate critical

command and staff functions to enable the unit to achieve a higher level of proficiency. The four focused multiechelon events are:

- Establish the network and COP
- Conduct collaborative and parallel planning
- Plan and manage lethal and non-lethal fires and effects
- Plan, support and manage brigade logistics operations

These training events span from platform level to all echelons of the brigade to ensure the unit can distribute and manage information in support of critical command and staff tasks. These events are based on TSPs similar to those for staff training.

CP Exercises

This phase corresponds to Level V of the TRADOC Digital Training Model (Table 7-1). The brigade and each task-organized infantry battalion conduct CPXs that stress multi-functional command and staff functions at a realistic OPTEMPO. These multi-echelon training events enable the brigade and its battalions to practice and execute automated CP operations and to refine operating procedures.

NET

NET begins when unit sets of tactical systems are available for issue to the unit and is the overall responsibility of PEOs, PMs and Army Materiel Command (AMC). This equipment fielding and training should take place in consolidated battalion-level unit sets.

Training Support

While the a unit is to be self-sufficient for digital training, the evolution of hardware and software will necessitate delta training. To the maximum extent possible, this will be the unit's responsibility. However, AMC, PMs, other PEOs

and PEO C3(T) have field offices throughout the Army. Their mission is to coordinate, assist, and monitor PMs' plans, preparations and execution of their NET and the fielding and issue of equipment to the unit. The particular emphasis of this organization is presentation of training on interoperability with the systems and integration with other systems. This field office closely coordinates unit ABCS overview and integration training with training personnel and supporting PMs.

Notes

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ANNEX A
ABCS v6.2 CAPABILITIES & v4.3 to v6.2 INTEROPERABILITY

Overview: This annexr provides a description of the capabilities of ABCS version (v) 6.2 software and compares current capabilities with planned enhancements to v6.2. Additionally, it provides a short insight into interoperability between v4.3 and 6.2.

A-1 Capabilities

The following list is a recapitulation of the capabilities of ABCS v6.2. Personnel with experience in previous versions of ABCS will notice considerable enhancements in this version.

- Initial TI monitoring at brigade and below
- Brigade VTC capability between brigade and above CPs
- Information Assurance (IA) capabilities on ABCS workstations
- Compatibility with FBCB2 v3.3.3
- Collaborative planning using:
    - NetMeeting between the light boxes (MCS and ASAS)
    - SunForum between the ABCS workstation for brigade and battalion

    - Internet Workstation (IWS) for division and above to support joint collaboration
- Common UTO tool for all BAS
- Addition of MCS-L systems (NT-based laptops) to the ABCS architecture
- Additional USMTF and JVMF messaging capability
- Additional BOS information written to the JCDB (AFATDS target information and fire support geometries, ASAS overlay information)
- Blue feed from EBC with improved filtering and rendering performance and right click capability
- MCS, ASAS, CSSCS, AFATDS, and AMDPCS can view the COP
- Additional overlap providers for displaying IMETS, DTSS, TAIS, and JSTARS information on the COP
- Man Machine Interface (MMI) enhancements to the depiction of the operational picture.

A-2 ABCS v4.3 to v6.2 Interoperability

ABCS 6.2 as a system-of-systems was not designed to be "backwards" compatible with ABCS 4.3. However, each BAS system has its own level of "stovepipe" compatibility with previous versions of that BAS. Table A-1 lists compatibilities and shortfalls between versions of each BAS. Note that known shortfalls are being addressed.

DTSS	MCS	GCCS-A	AFATDS
Compatibilities			
• Software upgrade for III Corps (v4.3 to v6.2)	• MCS incompatible between v4.3 and v6.2	N/A (by Jul/Aug 2001 all corps-level units to have v6.2 with delivery #3	• Available but limited under Package 11 Fire Support Automated Test System (FSATS) Vertical only
Shortfalls			
• None, if III Corps fielded prior to "Everything in Place Date"	• Requires "swivel-chair" workaround to send/receive between versions. • No COP available	N/A	• Man-in the-loop required for communications interface • No automated FSCM coordination • No message exchange based on A99 functions

Table A-1. BAS Compatibilities and Shortfalls

IMETS	CSSCS	FBCB2	TAIS
Compatibilities			
• Can pass vertically between IMETS & horizontally between ABCS	NONE	NONE	N/A (TAIS is in v6.2 fielding only)
Shortfalls			
• Not fielded in all ABCS units	• Not fielded in all ABCS units	• Ability to pass graphics, messages, and data is limited	• Not fielded in all ABCS units

ASAS	AMDPCS
Compatibilities	
• External Data Coordination (EDC) message • FTP • Imagery exchanged via USMTF messages using Simple Mail Transfer Protocol (SMTP)	• "Air breathing" tracks and data
Shortfalls	
• Cannot exchange graphics/overlays with consistency	• No ADA mission planning data exchanged • Does not share tactical ballistic missile data

Table A-1. BAS Compatibilities and Shortfalls

Notes

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ANNEX B
SHIFT CHANGE CHECKLIST

This annex provides a consolidated checklist for conducting shift changes. The information was taken from the IBCT series of TSPs.

BAS Operators	
1. Receive/review current section relevant COP products. Verify Map sheets. Verify critical priority information display requirements for CIC.	
2. Brief/review changes to filter settings and why.	
3. Brief/review changes to address book and why. Verify current operations mission #s, verify UTOs, cross check UTO with MCS and S6 FBCB2 system administrators. Check to see if standard naming conventions are being used.	
4. Brief/review file management. Perform before operations maintenance as necessary.	
5. Brief/review status of BAS - stable, crashed, or whatever - and corrective action taken.	
6. Conduct data base backups per SOP.	
7. Brief/review digital products created/updated during last shift and where they are archived. Delete/dispose of irrelevant data/file/msg/log.	
8. Brief/review any works in progress: (special notes below for CSSCS) CTIL adjustments reports from internal and supported unit BAS operator Supply point status/location and DTG for appropriate classes of supply reported by your CSSCS or ABCS BAS. Verify mobile container exchange point status/ locations. Verify MTS elements at current operation (Distribution Management Center [DMC] TRANS MTS Control Station) Verify Computer Remote Computer (CRT) locations, crosscheck with MCS operator. Verify MC levels I-IV message/reports during last 12 hrs, (Medical Operations) Verify data communications with supporting logistic operations BASs operators via GCCS by sending unicast FTM.	
9. Brief/review Officer In Charge (OIC) RFIs and changes of digital guidance.	

BAS Operators (continued)	
10. Review message logs (in and out).	
11. Review and clear Queues and Logs, as necessary.	
12. Report to Non-Commissioned Officer-in-Charge (NCOIC) that BASs before operations checks are completed.	
Engineer/MSC	
1. Ensure digital equipment database and message queues and logs are updated and current.	
2. Review journal entries from past 12 hours.	
3. Review filter settings - change as necessary based on current operations or as operations change.	
4. Current CCIR - note changes in last 12 hours.	
5. Current operational graphics - note changes in last 12 hours.	
6. Update staff estimate with outgoing shift counterpart.	
7. Review current active overlays.	
8. Review section inputs to the COP for currency.	
9. Review UTO within BAS to ensure it is current and synchronized.	
10. Check section web products to ensure current and correctly posted.	
Surgeon Section	
1. Ensure digital equipment database and message queues and logs are updated and current.	
2. Update staff estimate with outgoing shift counterpart.	
3. Review journal entries from past 12 hours.	
BOLT Section	
1. Review journal entries from past 12 hours.	
2. Update staff estimate with outgoing shift counterpart.	
PMO Section	
1. Review journal entries from past 12 hours.	
2. Update staff estimate with outgoing shift counterpart.	

UMT	
1. Review journal entries from past 12 hours.	
2. Update staff estimate with outgoing shift counterpart.	
Individual/Counterpart	
1. Review and verify any works in progress (staff estimates, overlays, orders, FRAGOs, etc.), where they are located, and their disposition.	
2. Review and verify all products (digital - overlays, individual graphic control measures, etc., and analog) during the past 12 hours.	
3. Review CCIR, PIR, Information Requirements (IR), Friendly Forces Information Requirements (FFIR), and changes in digital guidance.	
4. Review and verify all filter settings for familiarization and identify any changes during the past 12 hours. Check individual settings to ensure they correspond to the TACSOP standard setting or verify what authority approved the change and reason why the change is in effect.	
5. Review message logs, both in and out.	
6. Review and clear Queues and Logs as necessary.	
7. Review any network or digital system technical problems and their status.	
8. Review any significant events during the past 12 hours such as UTO changes, address list changes, etc.	
9. Review MHTs for any changes.	
10. Review current individual products posted on the web.	
11. Oncoming shift must ask questions, clarify answers, and end the discussion with a comfortable feeling about what has gone on over the past 12-hour shift.	
Battle Captain/Battle Staff NCO	
1. Review journal entries from past 12 hours.	
2. Review FRAGOs issued in last 12 hours.	
3. Current CCIR - note changes in last 12 hours.	
4. Review COP displays.	
5. Current operational graphics - note changes in last 12 hours.	
6. Review FRAGOs issued to the unit in the last 12 hours (note changes or updates to unit mission).	
7. Review changes or updates to commander's current guidance and intent.	
8. Review current unit status.	

Battle Captain/Battle Staff NCO (continued)	
9. Review status of C2 systems.	
10. Review current digital wing board data.	
S1/S4 Section	
1. Ensure digital equipment database and message queues and logs are updated and current.	
2. Review journal entries from past 12 hours.	
3. Review filter settings - change as necessary based on current operations or as operations change.	
4. Current CCIR - note changes in last 12 hours.	
5. Review current and future operations and CSS synchronization matrices. Compare current operation against both matrices, inquire as required.	
6. Review current logistics and personnel staff estimates. Update staff estimate with outgoing shift counterpart.	
7. Review UTO in CSSCS, MCS, and FBCB2. Synchronize as required. Ensure CSSCS database is updated.	
8. Recalculate reports.	
9. Review gumball status, peelback as required.	
10. Review Class II and VII losses, inquire as required.	
11. Review casualties, BAS, and evacuation status, inquire as required.	
12. Review current and scheduled Logistical Package (LOGPAC) status, inquire as required.	
13. Review other movements, inquire as required.	
14. Review current and scheduled Logistical Situation Reports (LOGSITREPs), inquire as required.	
15. Review current and scheduled PDS, inquire as required.	
16. Review current and scheduled personnel transactions.	
17. Review CCIR – change as required.	
18. Complete developing and submit updates to logistics and personnel estimates.	
S2 Section	
1. Ensure digital equipment database and message queues and logs are updated and current.	
2. Review journal entries from past 12 hours.	

S2 Section (continued)	
3. Review filter settings - change as necessary based on current operations or as operations change.	
4. Current CCIR - note changes in last 12 hours.	
5. Review current SU.	
6. Update staff estimate with outgoing shift counterpart.	
7. Review current active overlays.	
8. Review section inputs to the COP for currency.	
9. Review UTO within BAS to ensure it is current and synchronized.	
10. Check section web products to ensure current and correctly posted.	
S3 Section	
1. Ensure digital equipment database and message queues and logs are updated and current.	
2. Review journal entries from past 12 hours.	
3. Review filter settings - change as necessary based on current operations or as operations change.	
4. Current CCIR - note changes in last 12 hours.	
5. Current operational graphics - note changes in last 12 hours.	
6. Update staff estimate with outgoing shift counterpart.	
7. Review current active overlays.	
8. Review section inputs to the COP for currency.	
9. Review UTO within BAS to ensure it is current and synchronized.	
10. Check section web products to ensure current and correctly posted.	
Chemical Section	
1. Review journal entries from past 12 hours.	
2. Update staff estimate with outgoing shift counterpart.	
3. Review current SA and input to COP.	
SPO/DMC	
1. Ensure ABCS database and message queues and logs are updated and current.	
2. Review journal entries from past 12 hours.	
3. Review filter settings - change as necessary based on current operations or as operations change. Ensure subordinate CPs, supply points, CRTs and all other mobile elements acknowledge and confirm proper settings. “Police up the data litter” from FBCB2 C2 and SU; think bandwidth conservation.	
4. Current CCIR - note changes in last 12 hours. Note Weather forecast.	

SPO/DMC (continued)	
5. Current operational graphics - note changes in last 12 hours.	
6. Update staff Logistics/Personnel/Medical Operations estimates with outgoing shift counterpart.	
7. Review current mapsheet, supported missions, and active overlays.	
8. Discuss/review/update section inputs to the COP for currency: • Assume responsibility for the following actions: supply point status and location, resource data, MC4 status, MTS control station, CTIL, most recent commander SITREPs. • Collaborate with supporting base operations GCCS station OIC.	
9. Review UTO within BAS to ensure it is current and synchronized with current operation mission number; crosscheck with S6 TI manager.	
10. Check section web products for support of current planned missions; collaborate with webmaster to dispose irrelevant data.	
S6 SECTION	
1. Ensure digital equipment database and message queues and logs are updated and current.	
2. Review journal entries from past 12 hours.	
3. Review filter settings - change as necessary based on current operations or as operations change.	
4. Current CCIR - note changes in last 12 hours.	
5. Current operational graphics - note changes in last 12 hours.	
6. Update staff estimate with outgoing shift counterpart.	
7. Review current active overlays.	
8. Review section inputs to the COP for currency.	
9. Review UTO within BAS to ensure it is current and synchronized.	
10. Check section web products to ensure current and correctly posted.	
FECC/FSE/FDC	
1. Ensure digital equipment database and message queues and logs are updated and current.	
2. Review journal entries from past shift. Note required actions to be continued or completed during oncoming shift.	

FECC/FSE/FDC (continued)	
3. Review filter settings - change as necessary based on current operations or as operations change.	
4. Review current commander's criteria for processing targets and conduct of missions.	
5. Review current CCIR - note changes in last shift.	
6. FSCM - note changes in last shift/planned changes for upcoming shift.	
7. Review/update staff estimate with outgoing shift counterpart.	
8. Review current active missions.	
9. Review section inputs/overlays to the COP for currency.	
10. Review BDA reports from last shift and reports pending.	
11. Review UTO within BAS to ensure it is current and synchronized.	
12. Check section web products to ensure current and correctly posted.	
ADAM/ADACC/ADE	
1. Ensure digital equipment database and message queues and logs are updated and current.	
2. Review journal entries from past 12 hours.	
3. Review filter settings - change as necessary based on current operations or as operations change.	
4. Current CCIR - note changes in last 12 hours.	
5. Current operational graphics - note changes in last 12 hours.	
6. Update staff estimate with outgoing shift counterpart.	
7. Review current active overlays.	
8. Review section inputs to the COP for currency.	
9. Review UTO within BAS to ensure it is current and synchronized.	
10. Check section web products to ensure current and correctly posted.	

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ANNEX C
SYSTEM INITIALIZATION

Overview: This Annex outlines how the user brings up each system safely. Often, there are multiple user log-ins, multiple choices presented to the operator for correct role/affiliation, and different ways to handle proper shutdown depending on the cause of the problem. For detailed information on how to execute these functions, you should tell the operator to consult the most current operator's manual. The information in this chapter is a composite of checklists developed by the CTSF, Fort Hood, the IBCT ABCS TSPs and Training Division, TPIO-ABCS.

C-1 Introduction

Initialization is a complex process requiring proficient operators and knowledgeable, involved leaders. This chapter assumes the ABCS architecture of the CP is on hand and operational and that each system is loaded with the current software. If time and circumstances permit, you can initialize prior to deployment. Pre-deployment initialization also allows units easier access to external technical support. This provides you full interconnectivity as you enter the area of operations. Units, however, must nevertheless be technically self-sufficient to perform initialization tasks within theater following deployment. Prior to deployment, determine the following:

- Who are you (role name)?
- Who do you need to know (address book requirements)?
- Where are you (CP network address)?
- What version of software? (BAS compatibility/functionality)?

Having good SOP and TTPs helps ensure you have a good plan.

The CP server should *always* be first up and usually last down. The CP Server provides:

- Information processing services to applicable clients within the CP
- Forwarding capabilities for C2 uni-cast messages originating from the TI
- The CP entry and exit point for SU data coming from and going to the TI.

The CP server components are:

- Services
    - Network Time Protocol
    - Netscape Web Service
    - C2 Registry
    - Distributed Computer Environment (DCE)
    - Dynamic Host Configuration Protocol (DHCP)
    - Domain Name Server (DNS)
    - CP Boot Control
    - Defense Information Infrastructure Common Operating Environment Kernel (DII COE KERNEL)
    - Solaris Operating System (OS)

- C2
  - Communications server

  - SU
    - COP (Modules)
    - Live Feed
    - Blue Agent
    - EBC

- Other Components
  - COP
  - CMP
  - Common Look and Feel
  - Wireless Distribution System (WDS), Send and Receive [SR] and Omni-Cast)
  - Security
  - JCDB
  - Alerts
  - JMTK/COP

C-2 Deployment Preparation

To place each ABCS system in a state of readiness as per unit SOP in preparation for deployment, complete the steps listed in Table C-1.

Actions	Complete
CMP	
Set up address books per unit SOP. Each address book should contain VMF and USMTF distribution lists	
Clean out all old messages in the main message menu	
Clean out all old messages in the message log	
Verify the header defaults in the configuration menu	
Using the JVMF free text and USMTF genadmin messages, develop the standard color reports that are used on a daily basis. Save each message	
COP	
Develop the following map areas for Kosovo and save them. Use the following information to develop these areas: Center: 34TCL7848877861, Scale: 1:C00,000, Name: Xhafzotaj_1-C00 Center: 34TDM1774106960, Scale: 1:2C0,000, Name: Burrel_1-2C0 Center: 34TDM778C773C64, Scale: 1:2C0,000, Name: Prizren_1-2C0	
Develop the required chart tabs per unit SOP; place a map type on each tab and save the tabs.	
Develop any new graphical or unit pallets that are needed per SOP.	

Table C-1. Deployment Preparation Tasks

Actions	Complete
COP (continued)	
Develop any blank notional overlays that will be used during an operation. These should be developed per unit SOP. (At this time these overlays are blank and portions of the naming convention will be blank. Once information is placed on these overlays, they can be renamed to reflect the current operation.) Save each overlay.	
Develop a CP Picture with at least two CP Overlays that will display friendly blue unit centers of mass from the JCDB for your unit. This should be a unit SOP item.	
Develop another CP Picture that will display friendly blue unit centers of mass from the JCDB that need to be tracked by your unit.	
Develop a CP filter to display the correlated red picture from the JCDB.	
Develop locations in the above map areas using the Gazetteer.	
Set the declutter tool to display only company and higher units for the live blue feed.	
Plan Manager	
Delete all old orders, overlays and UTOs from the plan manager.	
Map the network drive to plan manager	

Table C-1 (continued). Deployment Preparation Tasks

Actions	Complete
UTO	
Construct the base line UTO	
MCS-L	
Perform the CMP tasks	
Perform as many of the CTP/COP tasks as possible.	
Perform the Plan Manager tasks.	
ASAS-L	
Perform those tasks that can be accomplished on the ASAS	
Perform all the CTP/COP tasks.	

Table C-1 (continued). Deployment Preparation Tasks

C-3 ABCS Initialization

Figure C-1 provides a graphical depiction of this process. The remainder of this chapter provides the necessary checks for leaders to ensure proper initialization of the system.

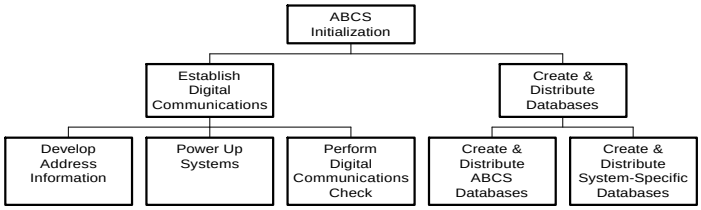

Figure C- 1. Initialization Process

To establish digital communications, you must develop address information, power up the ABCS, and perform digital communication checks between systems. The initialization process is divided into two steps:

1. Establish Digital Communications
    - Develop Address Information (Paragraph C-4)
    - Power Up Systems (Paragraph C-5)
    - Perform Digital Communications Checks (Paragraph C-6)

2. Create and Distribute Databases
    - Create and Distribute ABCS Databases (Paragraph C-7)
    - Create and Distribute System Specific Databases (Paragraph C-8).

Table C-2 provides a checklist of preliminary tasks required to continue the process.

Preliminary Tasks	Complete
Task: Verify ATCCS system capability for achieving an operational state	
System hardware correctly assembled.	
CP LAN connections established.	
Communication systems in place.	
External power established.	
Task: Determine Battle Staff ATCCS system start sequence for CP operations	
Identify CP/cell server.	
Identify any unique ATCCS client start considerations for correct integrated CP operations.	
Task: Correctly initiate/complete ATCCS start sequence	
Initiate system start. Correctly make all required operator input to aid system initialization process.	
Log ATCCS system onto CP LAN.	
Task: Prepare ATCCS system to initiate/conduct operations	
Verify system operational capability.	
Verify minimum network connectivity achieved for operational requirements.	

Table C-2. Initialization Preliminary Tasks

C-4 Develop Address Information

To develop address information, each system in the network must be identified. In turn, it must be determined which systems must communicate with one another and by what means. To communicate within your CP, you must make sure your router is configured with the correct IP addresses used in your address book for

your cell nodes. You can use the MCS DCE cell organization tool to see others with whom you can communicate outside your CP.

The UTO specified in the OPLAN is the start point for determining address information. Using the UTO and the MTOEs for the listed units, each ABCS system is located and identified by function and unit. In turn, this defines the types and numbers of workstations, their users, and their locations. This defines the ABCS architecture.

The UTOs, MTOEs, and the ABCS architecture diagram are together used to develop the Tactical Communications Diagram (TCD). The TCD is developed by the S6/G6 and is a schematic depicting the workstations and their interconnections (e.g., via jump boxes or routers). Jump boxes are used when two workstations are collocated and information is routinely transferred between them for continuous processing and distribution (e.g., between an FBCB2 and MCS workstation). The TCD helps to define the flow of information and to develop the table of addressees. A unit's previous versions of its TCD are useful in developing the TCD for the current OPLAN.

The CP Architecture Diagram (developed by the S6/G6) is developed from the TCD. The CP Architecture Diagram shows a CP's hardware and connections to include routers, LENs, and SENs. As with the TCD, previous versions of a unit's CP Architecture Diagram are useful when developing the diagram for the current OPLAN.

The Horse Blanket is a product developed under the auspices of Director of Information Systems for Command, Control, Communications and Computers (DISC4). The S6/G6 provides input about his unit’s net/sub-net structure information in the development of the Horse Blanket. It merges all the TCDs and CP Architecture Diagrams of a unit to show the full picture. It depicts a unit's entire ABCS capability by showing its every workstation and the communications systems that interconnect them. As with other diagrams, previous Horse

Blankets, TCDs, and CP Architecture Diagrams can be used to develop the Horse Blanket for the current OPLAN.

The Information Exchange Plan (IXP), established by the S6/G6, shows the routine flow of information among CPs. In essence, it describes who is to communicate with whom. It also shows what messages and reports must be sent to ensure timely distribution of critical information. The IXP is developed using the Horse Blanket and the TCD.

The development of address information should culminate in the Address Book. The Address Book lists each ABCS machine within the unit's architecture along with the information shown below. Information from the IXP, TCD, and Horse Blanket plus previous Address Books are used to develop the Address Book for a current OPLAN. When adding a new Address Book, always first delete the dan_resume file (do not reinitialize the system). Address Book information contains:

- ABCS machine
- IP address
- Unit Identity Code (UIC)
- Unit name
- Role
- Host name
- Machine name
- Cell name

C-5 Power Up Systems

The next step in Establishing Digital Communications is to power up the ABCS systems. This step involves two actions, preparing the ABCS system and powering it up. Preparing to power up the ABCS involves the preparation of these items:

- Vehicles
- Power Source
- Cables
- Other Equipment
- Power Setup
- SICPS Shelters
- Information Displays

Vehicles must be placed into position, and their antennas must also be correctly connected. All grounding wires should be tightly bound to their grounding stakes, and the stakes themselves firmly placed in the ground. Identify the electrical power source. If generators are used, they should be properly connected and grounded. Power cables should not be broken or frayed. Generator voltage and phase settings must be correct, and sufficient fuel must be on hand to ensure continuous power.

The SICPS must be correctly set up to support ABCS power up. Verify the required AC and DC circuit breakers and switches are on. Every Uninterruptible Power Supply (UPS) must be turned on and working properly, and router indicator lights should show proper activity. The Environment Control Unit (ECU) should be operating and set to the desired function, whether circulation, heat, or air- conditioning. The particulate filter should be activated, if required. Ensure hard drives are seated and locked into place and that the ABCS computers

are plugged into the UPS; however, never plug a printer into the UPS. LAN "T" connectors and terminators should be properly installed as well as LAN cables.

Key information should be on hand or identified. This includes the CP Architectural Diagram. Ensure servers have been identified for the DCE cell and each BAS. Also check to verify each computer has key information such as its IP address, host name, Originator/Recipient (O/R) name, and role.

After these preparations, ABCS and its supporting systems are ready for power up. The power up sequence is critical and must be carefully executed and supervised. Check to ensure all communications equipment is functioning.

Preparing to power up ABCS involves the preparation of the items listed at Table C-3. Use this table as a template for tracking preparatory procedures.

	Complete
Vehicles	
Vehicles are in position	
Antennas are properly connected	
Vehicles are properly grounded	
Generators/Commercial Power Source	
Power source is properly located	
Power source is properly connected	
Generators are grounded	
Adequate Class III is on hand to fuel the generators	
Cabling	
LAN "T" connectors and terminators are properly installed	
LAN cables are properly installed and not broken or frayed	
Other Equipment	
Monitors are properly connected	
Keyboards are properly connected	
UPSs are properly connected	

Table C-3. Prepare To Power Up

	Complete
Verify Power Setup	
Power cables are properly installed and not broken or frayed	
Generators are operating	
Voltage and phase settings are correct	
Standardized Integrated Command Post System (SICPS) Shelters	
Required AC circuit breakers and switches are on	
Required DC circuit breakers and switches are on	
UPSs are on and working properly	
ECU is set for desired function (circulation, heat, or A/C) and is working properly	
Particulate filter is activated, if required	
Router indicator lights show proper activity	
Verify LAN diagram is on-hand and accurate	
Verify DCE cell server is properly identified	
Verify BOS servers are properly identified	
Verify each computer has necessary key information (IP address, host name, O/R name, role)	

Table C-3 (continued). Prepare To Power Up ABCS

Use Table C-4 on the next page as a checklist for tracking power-up procedures.

Power Up the ABCS	
NOTE! • The power-up sequence is critical and must be carefully supervised and performed. • All ABCS computers on the LAN must be set to the same time (+/- 3 minutes of each other)	
Equipment	**Complete**
Communications Equipment	
SINCGARS	
SINCGARS (SIP) with INC (start before FBCB2)	
EPLRS	
AN/PSC-7	
AN/GRC-193	
AN/GRC-213	
Frequency Hopping Multiplexer (FH MUX)	
Precision Lightweight GPS Receiver (PLGR)	
Intercom, MESHNET, VIC-3, or VIICS x/VNR	
Criterion Decision Plus (CDP) Modem	
GBS BADD	
MSE	
MSE telephones	
Commercial telephones	
LAN router	
Tactical End to End Encryption Device (TEED)	
Wireless LAN	
FAX	

Table C-4. Power Up the ABCS

Equipment	Complete
Communications Equipment (continued)	
Video switch	
CNN receiver	
Other Equipment	
ATM/VTC	
Printer	
Large Screen Display	
ABCS Computers	
DCE Cell server*	
BOS servers	
BOS clients	

Table C-4 (continued). Power Up the ABCS

C-6 Perform Digital Communications Checks

The final step in establishing digital communications is to perform a digital communications check with required hosts. The operator should attempt to contact or "ping" each host on the LAN. If there is a ping failure, contact the LAN manager and troubleshoot the problem. Next, verify connectivity within the WAN by pinging a small number of hosts in other sections. If you get a failure, contact the WAN manager. If you cannot communicate from one BAS to another (e.g. from ASAS to MCS), check the following:

- Host name
- ATCCS Alias (must be an *exact* match)
- IP Address.

Use Table C-5 as a checklist for tracking connectivity procedures.

Action	Complete
Ping all hosts within the LAN	
Troubleshoot LAN ping failures (contact the LAN manager)	
Ping from multiple hosts on the LAN to identify malfunctioning host	
Verify connections and LAN terminator plug on suspect host	
Use LAN analyzer to locate fault	
Ping a minimum number of hosts in other cells to verify WAN connectivity	
Troubleshoot WAN ping failures (contact the manager)	

Table C-5. Establish Digital Communications

C-7 Create and Distribute ABCS Databases

The next step is to create and distribute the required databases. These include ABCS common databases and those required by individual systems. The ABCS common databases are those shared across the BASs. The information depicted in the COP will vary according to the unit's needs as determined by the commander. The COP is normally established on an MCS machine in the CP. See Chapter 5 for information that is typically incorporated into the COP. Use the Table C-6 as a checklist for tracking database distribution procedures:

Action	Complete
MCS	
Each MCS system administrator enters appropriate Auto-Send Rule	

Table C-6. Create and Distribute ABCS Databases

Action	Complete
MCS (continued)	
Each MCS system administrator enters appropriate Auto-Forward Rule	
AFATDS	
The Master Unit List (MUL) is built	
The AFATDS unit name and ID is added to the MUL	
The current situation database is built	
The communications database is built	
Databases are distributed appropriately	
CSSCS	
Corps G4 operator inputs UTO and distributes	
Corps G4 inputs and distributes status on the following:	
Class V	
Class VII	
Class IX	
Personnel	
Maintenance	
Network configuration table is defined	
Media selection table is defined	
Media selection table is defined	
CSSCS	
MHTs defined	
Named distribution list is defined	
Continuous Operations (CONOPS) table is defined	

Table C-6 (continued). Create and Distribute ABCS Databases

Action	Complete
ASAS	
All operators create the aliases and normalization (Dante) table	
All operators perform UIC/URN mapping	
All operators perform map symbol mapping	
All operators create the GeoReference table	
AMDPCS	
Operators at every level enter appropriate ADA asset locations	
Operators at every level enter appropriate AD control measures	
All operators create distribution lists for the following reports:	
E500 - Air Early Warning Message	
S201 - Support Battlefield Geometry	
S507L - Resource Report (Location)	
S507R - Resource Report (Resources)	

Table C-6 (continued). Create and Distribute ABCS Databases

Action	Complete
FBCB2	
Operators perform UIC/URN mapping	
Unit personnel input status and forward up chain of command on the following:	
Class I	
Class II Clothing Equipment	
Class II Supplies	
Class III Bulk	
DaVinci (Replacement for BPV)	
Friendly information is entered:	
Friendly UTO	
Unit UICs, name, echelon, subordination and location	
Number and type of weapon systems	
Range of weapon systems	
Comparative combat effectiveness values	
Number of dismounted infantrymen or engineers	
Number of vehicles/trailers by type	
Enemy information is entered:	
Enemy UTO	
Number and type of weapon systems	
Range of weapon systems	
Comparative combat effectiveness values	
Number of dismounted infantrymen/engineers	
Number of vehicles/trailers by type	

Table C-6 (continued). Create and Distribute ABCS Databases

Action	Complete
Barrier/mobility materiel status is entered:	
Quantity of mines by type	
Amount of concertina	
Quantity of Mine-Clearing Line Charge (MICLICs)	

Table C-6 (continued). Create and Distribute ABCS Databases

Commander's Tracked Item List (CTIL)**:**

- Enables the commander and staff to stay informed on the status of key information
- Commander develops CTIL from the Baseline Resource List (BRL)
- CTIL is transmitted from CSSCS to company level via FBCB2 using the K07.06 message (see Annex D)
- Typically, the company first sergeant or executive officer will forward the unit CTIL via FBCB2 to battalion CSSCS which, in turn, forwards it up the chain to the CTIL originator (usually brigade)

Friendly Unit Locations:

- Generated at the lowest level
- Automatically entered from the platform level into FBCB2 and transmitted up the chain through EBC which provides a continuous live feed to the JCDB
- At each MCS server, it is consolidated and automatically fed to all client MCSs

- Each echelon consolidates the information and sends it to higher, lower, and adjacent units
- Friendly unit locations will change every time a FBCB2 platform moves more than 100 meters, or every 10 minutes if it remains stationary, or every time the handset on a SINCGARS radio is keyed
- If operating with an analog unit, that unit's information must be entered manually

C-8 Distribute System-Specific Databases

The final step in initialization is creating and distributing databases specific to each system.

MCS operators input the Auto-Send and Auto Forward Time Rule Name (TRN) information. This enables MCS to automatically create USMTF messages to those they designate. To develop the list, use the DCE cell's organization tool.

AFATDS operators must build the MUL. They add the AFATDS unit name and identification to the MUL. Operators must also build the Current Situation and Communications Databases.

CSSCS operators must be provided the following information from their supervisor (who can obtain it from the S6/S3 section) and enter:

- Network Configuration Table
- Media Selection Table
- MHTs
- Named Distribution List
- CONOPS Table

The CSSCS operator at Corps G4 receives the MCS UTO and inputs the data. The UTO is then distributed via CSSCS channels throughout the corps. Table C-7 shows CSSCS Database Items and their means and source for updating:

CSSCS Database Items	Update Method/Source
Class I	Manual, FBCB2
Class II Clothing/Equipment	Manual, FBCB2
Class II Supplies	Manual, FBCB2
Class III	Manual, FBCB2
Class V	Automated SARSS, manual, FBCB2
Class IX	Automated SARSS, manual, FBCB2
Personnel	Automated SIDPERS, manual, FBCB2
Maintenance	Automated SIDPERS, manual, FBCB2
Medical	Manual, feed from TEMS
Transportation	TC ASCII

Table C-7. CSSCS Database Items and Updates/Source

ASAS operators at every level must create:

- Aliases and Normalization (Dante) Table
- Geo-Reference Table
- Perform UIC to URN mapping and map symbol mapping
- FBCB2 operators must complete UIC/URN mappings

AMDPCS operators are responsible for:

- Populating the database with ADA asset locations
- Air defense control measures
- Distribution of this information by the appropriate messages

DaVinci (if fielded) is used at division and corps to assist in COA analysis and wargaming. The DaVinci must be loaded with the following:

- US, allied, enemy, and neutral forces
- UICs, name, echelon, subordination, and current location
- Number, types, and ranges of weapon systems
    - Comparative values for unit combat effectiveness
    - Number of dismounted infantrymen and engineers
    - Number of vehicles and trailers by type
- Barrier/Mobility Material
    - Quantity of mines by type
    - Amount of concertina
    - Quantity of mine clearing line charges.
- Army CMP
- CMP is a messaging (USMTF, JVMF) engine used by ABCS
- Messages are generated from the database or from templates
- Using the MHT, the system administrator and/or operator determine how messages will be actioned, whether by the user or automatically by the system
- The operator can create a Name Distribution List (NDL) for dissemination of messages to multiple addressees.

Notes

Notes

ANNEX D
MESSAGES

Overview: ABCS employs USMTF messages to exchange information between the BOSs and supporting systems. This message format is currently undergoing revision to a Variable Message Format (VMF).

D-1 USMTF Messages

ABCS operates as an integrated system in garrison and field environments, developed and undeveloped theaters, fixed and semi-fixed installations, and in mobile networks. The objective ABCS will achieve fully automated interoperability with other Department of Defense (DoD) C4I systems. This will be accomplished by employing secure combined LANs and WANs, standard DoD worldwide commercial and military communications, and standard DoD architectures and protocols in accordance with current DoD policy. The objective ABCS will functionally link strategic, operational and tactical headquarters and interoperate with theater, joint and combined C2 systems across the full range of BOS functions. This will accomplish the user community goal of direct data exchange as the primary method of information exchange. The employment of standard message formats supports these aims.

The USMTF, designed for non-real-time exchange, is based on a character oriented message format and is the standard for man-readable and machine-processable information exchange. Table D-1 provides a list of the current ABCS

intersystem message interfaces for ABCS v6.2. If the box has an X in it, the two systems will interface with one another. Table D-2 provides you nine tables of USMTF messages. This information is extracted from the Internal Interface Specification for the ABCS, dated 9 March 2001, specifically version ACCS-A3-400-013.

INTERSYSTEM MESSAGE INTERFACES FOR ABCS 6.2

	AFATDS	ASAS	MCS	CSSCS	AMDPCS	GCCS-A	FBCB2	ISYSCON	DTSS	IMETS	TAIS
AFATDS		X	X	X	X		X	X		X	X
ASAS	X		X	X	X	X	X	X	X	X	X
MCS	X	X		X	X	X	X	X	X	X	X
CSSCS	X	X	X		X		X	X		X	X
AMDPCS	X	X	X	X			X	X	X	X	X
GCCS-A		X	X							X	
FBCB2	X	X	X	X	X				X		X
ISYSCON	X	X	X	X	X					X	X
DTSS		X	X		X		X			X	
IMETS	X	X	X	X	X	X		X	X		X
TAIS	X	X	X	X	X		X	X		X	

Table D-1. ABCS 6.2 Intersystem Message Interfaces

ABCS 6.2 United States Message Text Format (USMTF) Exchange Matrix

MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		GCCS-A		IMETS		ISYSCON		MCS				TAIS	
A423	Order	MCS	T	MCS	T	MCS GCC	T T	MCS	B	MCS	T	ASA MCS	R B	MCS	T	MCS	T	AFA ASA CSS AMD DTS ISY IME GCC TAI	R R B R R R R B R			MCS	T
A426	Electronic Warfare Requesting/Tasking Message					MCS	T											ASA	R				
A656	Sortie Allotment					MCS	T	MCS	T									ASA CSS	R R				
A659	Air Tasking Order			TAI	T													TAI	B			AMD MCS	R B
A690	Tactical Operational Data			MCS	T	MCS	T											ASA AMD	R R				
A804	Administrative/Logistics Order			CSS	T			MCS AMD TAI	R R B									CSS	T			CSS	B
C002	Message Correction or Cancellation			ISY CSS ASA TAI MCS	B B B B B	ISY AMD IME CSS MCS	B B B B B	ISY AMD ASA MCS	B B B B					ASA MCS	B B	AMD ASA CSS MCS	B B B B	ASA AMD CSS IME ISY TAI	B B B B B B			AMD MCS	B B
C110	Intelligence Report			ASA	T	MCS CSS AMD	R R R	ASA	T									ASA	T				
C111	Tactical Report			ASA	R-AP	MCS AMD	R T											ASA	T				

NOTES

1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills. Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON; MCS = Maneuver Control System; TAI = TAIS.

Table D-2 (part 1 of 9). ABCS 6.2 USMTF Exchange Matrix

MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		GCCS-A		IMETS		ISYSCON		MCS				TAIS	
C120	Meaconing, Intrusion, Jamming and Interference Feeder Report	ISY	B	MCS ISY	R R	MCS	T	ISY MCS	R B							MCS AMD AFA CSS	B T B T	ASA ISY AMD CSS	R B T B				
C121	Tactical ELINT Report			ASA	T	AMD	R																
C133	Sensor Tactical Contact Report					MCS	T											ASA	R				
C203	Graphical Report–Overlay Message			MCS TAI ASA	B B B-APF	MCS GCC TAI DTS CSS AMD IME	B B B B-APF B B B	MCS ASA TAI	B B-APF B	MCS ASA	B B-APF	ASA MCS	B-APF B	MCS ASA	B B-APF	MCS	T	ASA CSS AMD DTS IME GCC ISY TAI	B-APF B B B-APF B B R B			ASA AMD MCS CSS	B-APF B B B
C241	Ammunition Fire Unit – Mission Fired Report	ASA CSS MCS AMD	B-APF R R R	AFA	T-AF	AFA	B-APF	AFA	T-AF									AFA	T-AF				
C281	Artillery Target Intelligence – Artillery Target Report	ASA MCS	B-APF B			AFA	B-APF											AFA	B-APF				
C400	Commander's Situation Report	MCS ASA CSS AMD	B B B B	MCS CSS AFA	B B B	MCS GCC AFA	R R B	MCS AMD AFA	B B B			MCS ASA	T T					AFA ASA CSS AMD GCC TAI	B T B B R B			MCS	B

NOTES:
1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON; MCS = Maneuver Control System; TAI = TAIS.

Table D-2 (part 2 of 9). ABCS 6.2 USMTF Exchange Matrix

MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		GCCS-A		IMETS		ISYSCON		MCS				TAIS	
C443	NBC 3 Report	MCS	B	MCS	B	MCS	B	MCS	B			MCS	B	MCS	T	MCS	B	AFA ASA CSS AMD GCC ISY TAI IME	B B B B B B B R			MCS	B
C447	NBC 4 Report	MCS	R	MCS	B	MCS	B	MCS	B			MCS	B	MCS	T	MCS	B	AFA ASA CSS AMD GCC ISY TAI IME	T B B B B B B R			MCS	B
C488	NBC 1 Report	MCS	B	MCS	B	MCS	B	MCS	B			MCS	B	MCS	T	MCS	B	AFA ASA CSS AMD GCC ISY TAI IME	B B B B B B B R			MCS	B
C501	NBC 5 Report	MCS	B	MCS	B	MCS	B	MCS	B			MCS	B	MCS	T	MCS	B	AFA ASA CSS AMD GCC ISY TAI IME	B B B B B B B R			MCS	B

NOTES:

1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills
   Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON;
   MCS = Maneuver Control System; TAI = TAIS.

Table D-2 (part 3 of 9). ABCS 6.2 USMTF Exchange Matrix

MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		GCCS-A		IMETS		ISYSCON		MCS				TAIS	
C503	NBC Effective Downwind Report	MCS	T	MCS	B	MCS	T	MCS	T					MCS	T			ASA CSS AMD TAI AFA IME	R R B R R R			MCS	T
C504	Friendly Chemical Strike Warning	MCS	T	MCS	T	GCC	T	MCS	T			ASA MCS	R T	MCS	T	MCS	T	AMD ISY GCC TAI AFA CSS IME	R R R R R R R			MCS	T
C505	Friendly Nuclear Strike Warning	MCS	T	MCS	T	MCS GCC	T T	MCS	T			ASA MCS	R T	MCS	T	MCS	T	ASA CSS AMD ISY GCC TAI AFA IME	R R R R R R R R			MCS	T
C506	NBC 6 Report	MCS	B	MCS	B	MCS	B	MCS	B			MCS	R	MCS	T	MCS	B	AFA ASA CSS AMD GCC ISY TAI IME	B B B B T B R R			MCS	T
C507	NBC Chemical Downwind Report	MCS	T	MCS	T	MCS	T	MCS	T					MCS	R			AFA ASA CSS AMD IME TAI	R R R R T R			MCS	T

NOTES:
1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills
Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON;
MCS = Maneuver Control System; TAI = TAIS.

Table D-2 (part 4 of 9). ABCS 6.2 USMTF Exchange Matrix

MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		GCCS-A		IMETS		ISYSCON		MCS				TAIS	
C508	NBC Basic Wind Report	MCS	T	MCS	T			MCS	T					MCS	R			AMD IME TAI AFA CSS	R T R R R			MCS	T
C520	Weather Observation	IME	T	IME	T	IME	T			IME	T			ASA DTS MCS TAI AFA AMD	R R R R R R			IME	T			IME	T
C521	Weather Forecast	IME	T	IME	T	IME	T	IME	T	IME	T	IME	T	MCS ASA AMD CSS DTS ISY GCC TAI AFA	R R R R R R R R R	IME	T	IME	T			IME	T
C523	Severe Weather Warning	IME	T	IME	T	IME	T	IME	T	IME	T	IME	T	MCS ASA AMD CSS DTS ISY GCC TAI AFA	R R R R R R R R R	IME	T	IME	T			IME	T
D114	SIGINT/EA Planning/Coordination Message					MCS	B											ASA	B				

NOTES:

1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON; MCS = Maneuver Control System; TAI = TAIS.

Table D-2 (part 5 of 9). ABCS 6.2 USMTF Exchange Matrix

MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		GCCS-A		IMETS		ISYSCON		MCS				TAIS	
D210	Fire Mission – Call for Fire	CSS AMD MCS	T T-AF T	AFA	R-AP			AFA	R-AP									AFA	R-AP				
D281	Artillery Target Intelligence – Target Criteria	ASA	R-AP			AFA	T																
D630	Airlift Request			MCS	R			MCS TAI	R R									CSS AMD	T T			CSS	T
D675	Stop Jamming Message					ISY GCC MCS	T T T					ASA	R			ASA	R	ASA	R				
D851	Air Evacuation Request							MCS TAI	R R									CSS	T			CSS	T
E400	Operations Plan and/or Order Change	MCS CSS	R B	MCS	T	MCS	R	MCS AFA	B B	MCS	T			MCS	T	MCS	T	AFA ASA CSS AMD ISY DTS IME TAI	T T B R R R R R			MCS	T
E500	Air Early Warning Message	AMD	T-AF	CSS ASA AFA MCS ISY DTS GCC IME TAI	R R R R-AP R R R R R	AMD	T-AF	AMD	T-AF	AMD	T-AF	AMD	T-AF	AMD	T-AF	AMD	T-AF	AMD	T-AF			AMD	T-AF

NOTES:

1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills
   Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON;
   MCS = Maneuver Control System; TAI = TAIS.

Table D-2 (part 6 of 9). ABCS 6.2 USMTF Exchange Matrix

MSG NO.	MESSAGE TITLE	AFATDS	AMDWS	ASAS	CSSCS	DTSS	GCCS-A	IMETS	ISYSCON	MCS		TAIS
F002	General Administration Message	*All ABCS systems will be capable of transmitting and receiving these messages in accordance with MIL-STD-6040. (Reference: CJCSM 6120.05, Enclosure C, Section B, "Common Information Exchanges" and JIEO Circular 9153).*										
F014	Request for Information											
F015	Response to Request For Information											
F401	Electronic Warfare Employment Message			MCS R ISY R					ASA T	ASA T		
F402	Electronic Warfare Frequency Deconfliction Message			ISY T GCC B			ASA B		ASA R			
F541	Acknowledge Message	*All ABCS systems will be capable of transmitting and receiving this message in accordance with MIL-STD-6040. (Reference: CJCSM 6120.05, Enclosure C, Section B, "Common Information Exchanges" and JIEO Circular 9153).*										
F631	Airlift Mission Schedule				MCS T TAI R					CSS R		CSS T
F658	Airspace Control Means Request		MCS B-AP TAI B-AP							TAI B AMD B-AF		MCS B AMD B-AF
F756	Airspace Control Order		MCS B-AP TAI B-AP							TAI B AMD B-AP		MCS B AMD B-AP
G131	Intelligence Summary	ASA T	ASA T	MCS R AFA R CSS R AMD R GCC R	ASA T		ASA T			ASA T		
G424	Electronic Warfare Mission Summary			MCS R ISY R					ASA T	ASA T		

NOTES:

1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills. Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON; MCS = Maneuver Control System; TAI = TAIS.

Table D-2 (part 7 of 9). ABCS 6.2 USMTF Exchange Matrix

MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		GCCS-A		IMETS		ISYSCON		MCS				TAIS	
G489	NBC 2 Report	MCS	B	MCS	B	MCS	B	MCS	T			MCS	T			MCS	B	CSS ASA AFA AMD ISY GCC TAI	R B B B B R R			MCS	T
G880	Personnel Status Report			CSS	R			MCS AMD	R T-AF									CSS	T				
S102	Enemy Activity/Weapons			ASA	B	AMD MCS	B R											ASA	T				
S104	Special Operations					MCS	B											ASA	B				
S106	Engineer Support Request			MCS	R													AMD	T				
S109	Unit Tasking Order Linkage					GCC CSS MCS	T T T	ASA	R			ASA MCS	R T			MCS	T	ISY ASA GCC	R R R				
S201 (note 3)	Support Battlefield Geometry	MCS ASA CSS AMD TAI	B-APF B-APF B-APF B-APF B-APF	CSS ASA AFA MCS TAI	B-APF R-AP B-APF B-APF B-APF	MCS AFA CSS AMD GCC DTS IME TAI	B-APF B-APF B-APF B-APF B-APF R-AP R-AP B-APF	MCS AFA AMD ASA TAI	B-APF B-APF B-APF B-APF B-APF	MCS ASA	T-AF T-AF	ASA MCS	T-AF T-AF	ASA	T-AF	MCS	T-AF	CSS ASA AFA ISY AMD DTS GCC TAI	B-APF B-APF B-APF R-AP B-APF R-AP R-AP B-APF			AFA AMD ASA CSS MCS	B-APF B-APF B-APF B-APF B-APF
S202	Fire Planning – Artillery Target List	MCS	R															AFA	T-AF				
S301	Multiple Assets Effectiveness Report					MCS	R											ASA	T				

NOTES:

1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills
Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON;
MCS = Maneuver Control System; TAI = TAIS.
3. Special implementation requirements for the S201 message are defined in Paragraph 100.1.1.3

Table D-2 (part 8 of 9). ABCS 6.2 USMTF Exchange Matrix

MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		GCCS-A		IMETS		ISYSCON		MCS				TAIS	
S303	Enemy Observation Report			MCS ASA	R R-AP	ISY CSS MCS AMD	T T T T	ASA	R-AP							ASA	R-AP	AMD ASA	T R-AP				
S305	Target Intelligence Data Message	ASA	T-AF			AFA	R-AP																
S308	Artillery Target Intelligence – IEW Target Coordination Message	ASA	B			AFA	B-APF																
S309	Enemy Situational Awareness Message	ASA	T-AF	ASA	T-AF	MCS AMD AFA GCC ISY CSS	R R R-AP R-AP R R	ASA	T-AF			ASA	T			ASA	T-AF	ASA	T-AF				
S401	Air Defense Artillery Battle Report			ASA MCS	R R	AMD	T											AMD	T				
S507	Resource Report	MCS CSS	B-APF B	MCS CSS	B-APF B	MCS GCC	T-AF T	MCS AMD AFA TAI	B-APF B-APF B-APF B			ASA MCS	R-AP B-APF			MCS	B-APF	CSS ASA AFA ISY AMD GCC TAI	B-APF R-AP B-APF B-AP B-APF B B			CSS MCS	B B-APF
S508	Supply Constraints	CSS	T	CSS	T			AFA AMD	R R														
S509	Commander's Tracked Item List	CSS	T	CSS	T			MCS AMD AFA	R R-AP R			MCS	R					CSS GCC	T T				

NOTES:
1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills
Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON;
MCS = Maneuver Control System; TAI = TAIS.

Table D-2 (part 9 of 9). ABCS 6.2 USMTF Exchange Matrix

D-2 JVMF Messages

The Joint Variable Message Format (JVMF) is designed as a common means of exchanging digital data across a joint interface between combat units at varied echelons. It provides an extremely flexible message standard – only information required at the time is sent. Its use was directed by the Army as the solution to the challenges of battlefield digitization interoperability and bandwidth. It is variable because both the information and address portions can be selectively adapted to suit the operational situation. Data fields can be selected or omitted from a message as required, and it accommodates all data types (bit- and character-oriented). Table D-3 provides three tables depicting the exchange of ABCS 6.2 JVMF messages.

Core Msg	MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		FBCB2		GCCS-A		IMETS		ISYSCON		MCS		TAIS	
*	K01.1	Free Text	FBC	B	FBC	B	FBC	B	FBC	B	FBC	B	AFA AMD ASA DTS MCS TAI CSS	B B B B B B B							FBC	B	FBC	B
*	K01.2	Unit Reference Query/Response																						
*	K02.1	Check Fire	FBC	T									AFA	R										
*	K02.4	Call for Fire	FBC	T			FBC	T					AFA ASA	R R										
*	K02.6	Observer Mission Update	FBC	R									AFA	T										
*	K02.12	On Call Fire Command	FBC	T									AFA	R										
*	K02.14	Message to Observer	FBC	R									AFA	T										
*	K02.15	Fire Support Coord. Message											MCS	R							FBC	T		
*	K02.16	End of Mission and Surveillance	FBC	T									AFA	R										
*	K02.22	Subsequent Adjust	FBC	T									AFA	R										
*	K04.1	Spot/Salute Report					FBC	T					ASA MCS	R B							FBC	B		
*	K04.2	Land Route Report					FBC	B			FBC	B	DTS MCS ASA	B B B							FBC	B		
*	K04.3	Obstacle Report					FBC	B			FBC	B	DTS MCS ASA	B B B							FBC	B		

NOTES:
1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills
   Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON; MCS = Maneuver Control System; TAI = TAIS.

Table D-3 (part 1 of 3). ABCS 6.2 JVMF Exchange Matrix

Core Msg	MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		FBCB2		GCCS-A		IMETS		ISYSCON		MCS		TAIS	
*	K04.9	Bridge Report					FBC	B			FBC	B	DTS MCS ASA	B B B							FBC	B		
*	K05.1	Position Report			FBC	T							MCS AMD	B R							FBC	B		
*	K05.2	Nuclear, Biological, Chemical Report One											MCS TAI	B B							FBC	B	FBC	B
*	K05.4	Nuclear, Biological, Chemical Report Three											MCS	R							FBC	T		
*	K05.5	Nuclear, Biological, Chemical Report Four											MCS	B							FBC	B		
*	K05.9	Chemical Downwind Report											MCS	R							FBC	T		
*	K05.10	Effective Downwind Report											MCS	R							FBC	T		
*	K05.12	REDCON											MCS	B							FBC	B		
*	K05.13	Threat Warning Message			FBC	R	FBC	R					AMD ASA MCS	T T B							FBC	B		
*	K05.14	Situation Report					FBC	T					MCS ASA	B R							FBC	B		
*	K05.15	Field Orders					FBC	B					MCS ASA	B-APF B							FBC	B		
*	K05.16	Land Minefield Laying Report					FBC	B					MCS ASA	B B							FBC	B		
*	K05.17	Overlay Message					FBC	B			FBC	B	ASA DTS MCS TAI	B B-APF B-APF B							FBC	B	FBC	B

NOTES:
1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills
Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
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Table D-3 (part 2 of 3). ABCS 6.2 JVMF Exchange Matrix

Core Msg	MSG NO.	MESSAGE TITLE	AFATDS		AMDWS		ASAS		CSSCS		DTSS		FBCB2		GCCS-A		IMETS		ISYSCON		MCS		TAIS	
*	K05.18	MOPP											MCS	B							FBC	B		
	K05.19	Entity Data Information					FBC	B					ASA	B										
	K05.20	Execution Matrix																						
*	K07.1	Medical Evacuation Request							FBC	T			CSS	R										
*	K07.3	Logistics Report							FBC	T			CSS	R										
*	K07.4	Personnel Status							FBC	T			CSS	R										
	K07.6	CTIL/BRIL							FBC	R			CSS	T										
*	K07.9	Supply Point Status Report							FBC	B			CSS	B										
*	K07.12	Task Management																						

NOTES:
1. MESSAGE TRANSFERS: T = Transmits to above system, R = Receives from above system, B = Two-way exchange; -AP = Autopost; -AF = Autofill; -APF = Receiver Autoposts & Transmitter Autofills
   Messages not identified as AP, AF, or APF are manually processed using a template contained within the Common Message Processor (CMP).
2. SYSTEM IDENTIFIERS: AFA = AFATDS; AMD = AMDPCS; ASA = ASAS (Intel Fusion); CSS = CSSCS; DTS = DTSS; FBC = FBCB2; GCC = GCCS-A; IME = IMETS; ISY = ISYSCON; MCS = Maneuver Control System; TAI = TAIS.

Table D-3 (part 3 of 3). ABCS 6.2 JVMF Exchange Matrix

D-3 Information Sources

Table D-4 provides a quick reference to various categories of information, their source, and what they are.

Information Name	Applicable BAS	Definition
Sensor Data	FBCB2, AFATDS, ASAS, AMDPCS	Intelligence obtained from information collected by sensors regarding enemy movements/activities and to support estimates of enemy capabilities and intentions. Used primarily for imagery (Joint Surveillance and Target Attack Radar System [JSTARS], MTI/FTI, and secondary imagery).
Threat Warning	GCCS-A, FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS, ISYSCON	A message notifying units, commanders, and personnel of an imminent ballistic missile, aircraft, or NBC attack.
Spot Report	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	The standard verbal or digital report giving information about known or suspected enemy activity, including observer designation and SALUTE data.
Obstacle Report	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A report giving obstacle type, location, and impact on movement, bypass locations, safe corridors, and enemy activity near the obstacle. Platform through brigade levels

Table D-4. Information Categories

Information Name	Applicable BAS	Definition
Mine Field Report	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	Location and type of minefields employed by friendly forces. For minefields with automatic destruction capabilities; the time of destruction is also included.
Bridge Report	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	A report that includes: bridge, overpass, culvert, underpass, and tunnel data; location; entrance; exit; type; overall length; width of roadway; height restrictions; number of spans; length of spans; computed classification; bypass locations; and bypass conditions in the area of operations (AO). It also reports or confirms the description and condition of a bridge to support trafficability or destruction.
SITREP	FBCB2, MCS, AFATDS, ASAS, CSSCS, AMDPCS, TAIS	An informal report submitted by subordinate units on request or their own initiative to their higher HQ and adjacent units as necessary to report and define tactical situations and status.

Table D-4 (continued). Information Categories

Information Name	Applicable BAS	Definition
Basic Weather Report	IMETS, MCS, AFATDS, ASAS	The basic weather (WX) report provides current weather observations and forecasts at predetermined intervals. It includes the forecast weather conditions and light data for the next 24 and 48 hours. Specific information that will be included are EENT, Beginning of Morning Nautical Twilight (BMNT), sunrise time, sunset time, percent of illumination, moonrise, moonset, wind speed, wind direction, visibility, precipitation, temperature, ceiling, and barometric pressure. Chemical Downwind Message/Report (CDM/CDR), Effective Downwind Message/Downwind Report (EDM/EDR), and Basic Downwind Report (BDR)

Table D-4 (continued). Information Categories

Notes

Notes

ANNEX E
DIGITAL COMMAND AND CONTROL REHEARSAL

Overview: This annex provides a series of spreadsheets/checklists developed by each ABCS TRADOC System Manager (TSM). They provide a formal structure for a simulation or communications exercise prior to other exercises or a deployment to a Combat Training Center.

E-1 Introduction

Based on the lessons learned from DCX I and DCX II I, it is critical to conduct these actions and re-do the checks if systems fail or are added to the network.

E-2 Description

The Digital Command and Control Rehearsal (DC2R) is an assessment of C2 digital systems with the following key features and objectives:

- A phased operation that tests every message thread and ABCS collaborative functionality
- Ensures the simulation driver is properly passing SU messages to ABCS
- Ensures that the player unit gets a proper combination of live-feed, simulated feed, and wrap around to create the COP

- ABCS must ensure it is able to successfully merge both live and simulated unit data
- The DC2R is a deliberate test of the entire system architecture, both top down and bottom up
- The DC2R helps units understand ABCS and what it can do

The DC2R must be the main effort of the unit leadership. An exercise order and synchronization matrix must be published. Trainers should plan for an exercise of four to seven days duration (based on unit digital proficiency).

E-3 DC2R Phases

Table E-1 summarizes the DC2R Phases:

Phase	Description	Remarks
0	Pre-Deployment Activities	Main effort by unit leadership in planning for a 4 to 7 day exercise.
I	Digital Equipment Inspection	Consists of inspecting digital equipment to ensure all needed pieces are on hand
II	Intra-CP & Tactical Internet	Concentrates on ensuring the ABCS network is operating correctly
III	Inter-CP and Tactical Internet	Begins with the Simulation/Stimulation (sim/stim) load and continues with ABCS network validation
IV	Simulation/ Stimulation	The network is fully loaded from the simulation to verify unit icons (both live and simulated) are displayed in support of SU. This phase also ensures the simulation properly feeds messages into ABCS

Table E-1. DC2R Phase Summary

Phase 0 – Pre-deployment Objectives:

- Verify digital vehicle load plans for required equipment to operate systems at the port of debarkation (POD) (i.e., digital systems, antennas, radios, COMSEC, cables, PLGRs)
- Identify the correct unit SMEs and equipment to perform the required Pre-Combat Inspections (PCIs) upon arrival
- Coordinate with the simulation center for pre-exercise sim/stim
- Develop the UTO for the digital rehearsal
- Develop the communications plan to support the UTO and digital concept of operation
- Load communications and networking equipment with configuration scripts (Management Information Base [MIB]); additionally, assign and distribute frequencies and IP addresses
- Share assignment and configuration information between network management platforms.

Phase I – Digital Inspection Objectives (see Table E-2 below):

- Conduct vehicle PCIs to include antennas mounted, radios installed, cables connected, COMSEC fills loaded, batteries on hand, and voice communications checked
- Conduct vehicle and equipment inspection to verify operability and functionality before movement into the assembly area
- Load backup hard drives (i.e., "burn backup bricks") for the primary and backup server for each CP as a minimum and each ABCS terminal (if available)
- Initialize the LAN (CP router) and ensure it is ready to accept users for intra- and inter-CP communications

- Ensure the Tactical Internet Manager (TIM) is operational and checking intra-CP LAN as ABCS systems are connected; once connected, commence intra-CP message threads
- Verify that the NTDR network is operational from a radio frequency using the NTDR Management Terminal (NMT)
- Check for inter-CP connectivity using the TIM; once the TIM has verified radio connectivity to other CPs, commence testing inter-CP message threads

Phase II – Intra-CP & TI Objectives:

- Initiate Phase II message threads. See Annex D, Tables D-1 through D-3
- Commence TI checks in accordance with unit SOP
- Pass messages, orders, and overlays within each BFA and CP
- Verify the ability to display SA on the CIC within each CP

Phase III – Inter-CP & Lower TI Objectives:

- Initiate Phase III with messages and orders; migrate to overlays and CSS input by working top/down, bottom/up, then horizontally
- Conduct FBCB2 C2 messaging and TI verifications
- Exchange point-to-point whiteboarding at brigade and subordinate battalions
- Conduct BVTC between division and brigade
- Systematically employ sim/stim: Blue SU lower; Red SU lower; Red SU higher; Blue SU wrap around
- Continue to monitor network status; provide updates as appropriate

Phase IV – Full Network Load Objectives:

- Begin sim/stim full load to include the wrap around
- Integrate GCCS-A into feed if a joint scenario exists
- Maintain digital connectivity throughout the remainder of the exercise
- Continue to monitor network status and provide updates as appropriate

Phase IV stresses the system through a sim/stim feed to ensure the network can merge live and simulation feeds into a seamless picture of the battlefield in the CIC.

At the completion of all phases, all systems are operational and fully interconnected with the ABCS architecture. C2 processes are fully rehearsed and procedures validated. All ABCS message threads and functionalities are also fully rehearsed, and combined SU between live and simulated units is validated.

An important part of the execution of the DC2R is a daily meeting to assess the digital status of the systems, what was accomplished so far, and what must be accomplished the next day. This meeting is called a Technical Assessment Meeting (TAM). During this meeting, key personnel brief their digital assessment and status. The TAM must be timely enough to impact the next day's events.

E-4 Phase I Checklist

Table E-2 provides an example checklist to assist units in conducting inspection of equipment in preparation for a DC2R using ABCS v 6.2. This checklist is provided only as an illustration. For additional lists, refer to the Warrior-T site at ftp://150.114.141.248/

Veh #	HQ 213			
EPLRS	+			
ANT	NU			
INC				
ASIP				
PLGR	+			
Drop				
Cables	PLGR Cable			
DU	+			
KB	+			
CPU	+			
Unit				
Additional Problems or Comments	PLGR cable broken			

Key: + = Good. NU = Not Up. NP = No Power. PCT = Passed Connectivity Test.
5B = New Map Drop

Table E-2. Phase I ¾ Digital Equipment Inspection Checklist

Notes

Notes

Glossary

A2C2	Army Airspace Command and Control
A2C2S	Army Airborne Command and Control System
AAR	After Action Review
ABCS	Army Battle Command System
AC	Alternating Current
ACE	Analysis and Control Element
ACM	Airspace Control Measure
ACMNAME	Airspace Control Measure Name
ACO	Airspace Control Order
ACT	Analysis and Control Team
ACUS	Area Common User System
ADA	Air Defense Artillery
ADACC	Air Defense Airspace Coordination Cell
ADAM	Air Defense and Airspace Management
ADE	Assistant Division Engineer
AFATDS	Advanced Field Artillery Tactical Data System
ALOC	Administrative and Logistical Operations Center
AMC	Army Materiel Command
AMDPCS	Air and Missile Defense Planning and Control System

ARFOR	Army Forces
ASAS	All Source Analysis System
ASAS-L	All Source Analysis System - Light
ASI	Additional Skill Identifier
ASIP	Advanced System Improvement Program
ASR	Alternate Supply Route
ATCCS	Army Tactical Command and Control System
ATM	Asynchronous Transfer Mode
ATO	Air Tasking Order
AWE	Advanced Warfighting Experiment
AXP	Ambulance Exchange Point
BADD	Battlefield Awareness Data Dissemination
BAS	Battlefield Automation System
BCC	Brigade Coordination Cell (Fort Lewis)
BDA	Battle Damage Assessment
BFM	Battlescale Forecast Model
BLOS	Beyond Line-of-Sight
BMNT	Beginning (of) Morning Nautical Twilight
BOLT	Brigade Operations Legal Team
BOS	Battlefield Operating System
BRL	Baseline Resource List
BRSS	Brigade Remote Subscriber Services

BSN	Brigade Subscriber Node
BVTC	Battlefield Video Teleconferencing
C2	Command and Control
C4I	Command, Control, Communications, Computers, and Intelligence
C4ISI	CSS Automation-Information Systems Interface
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CADRG	Compressed ARC Digitized Raster Graphics
CCP	Casualty Collection Point
CCIR	Commander's Critical Information Requirement
CDP	Criterion Decision Plus
CGS	Common Ground Station
CI&I	Counter Intelligence and Information
CIC	Command Information Center
CinC	Commander in Chief
CMP	Common Message Processor
CNR	Combat Net Radio
COA	Course of Action
COE	Common Operating Environment
COMSEC	Communications Security
CONOPS	Continuous Operation

COP	Common Operational Picture
CP	Command Post, Common Picture
CPU	Central Processing Unit
CPX	Command Post Exercise
CRT	Computer Remote Terminal
CSS	Combat Service Support
CSSCS	Combat Service Support Control System
CTCP	Combat Trains Command Post
CTIL	Commander’s Tracked Item List
CTSF	Central Technical Support Facility
CTTL	Critical Training Task List
DC	Direct Current
DCE	Distributed Computer Environment
DC2R	Digital Command and Control Rehearsal
DHCP	Dynamic Host Configuration Protocol
DII COE KERNEL	Defense Information Infrastructure Common Operating Environment Kernel
DISC4	Director of Information Systems for Command, Control, Communications and Computers
DIVARTY	Division Artillery
DMAIN	Division Main (command post)
DMC	Distribution Management Center
DNS	Domain Name Server

DoD	Department of Defense
DSS	Dismounted Soldier System
DTG	Date Time Group
DTSS	Digital Topographic Support System
DU	Display Unit
EAC	Echelons Above Corps
EBC	Embedded Battle Command
ECB	Echelons Corps and Below
ECU	Environmental Control Unit
EDC	External Data Coordination
EEFI	Essential Elements of Friendly Information
EENT	End Evening Nautical Twilight
EHF	Extremely High Frequency
EMPRS	En Route Mission Planning and Rehearsal System
Engr	Engineer
EPLRS	Enhanced Position Location and Reporting System
EXFOR	Experimental Force
FBCB2	Force XXI Battle Command Brigade and Below
FDC	Fire Direction Center
FEC	Forward Error Correction
FECC	Fires and Effects Coordination Cell

FFIR	Friendly Forces Information Requirements
FH Mux	Frequency Hopping Multiplexer
FM	Field Manual, Frequency Modulation
FO	Force Operations
FRAGO	Fragmentary Order
FSATS	Fire Support Automated Test System
FSB	Forward Support Battalion
FSC	Forward Support Company
FSCM	Fire Support Coordination Measures
FSE	Fire Support Element
FTI	Fixed Target Indicators
FTM	Free Text Message
FTP	File Transfer Protocol
FVWM	Free Virtual Window Manager
gbps	gigabytes per second
GBS	Global Broadcast Service
GCCS	Global Command and Control System
GCCS-A	Global Command and Control System - Army
GPS	Global Positioning System
GUI	Graphic User Interface
HCLOS	High Capacity Line of Sight
HMMWV	High Mobility Multipurpose Wheeled Vehicle

HPT	High Payoff Target
HQ	Headquarters
HQDA	Headquarters, Department of the Army
HUMINT	Human Intelligence
HVT	High Value Target
IA	Information Assurance
IBCT	Interim Brigade Combat Team
ID	Identity, Identification
IDM	Information Dissemination Management
IKP	Instructors and Key Personnel
IMETS	Integrated Meteorological System
INC	Integrated Network Controller
IO	Information Operations
IP	Internet Protocol
IPB	Intelligence Preparation of the Battlefield
IR	Information Requirements
ISDN	Integrated Service Digital Network
ISR	Intelligence, Surveillance, and Reconnaissance
ISYSCON	Integrated System Control
IWEDA	Integrated Weather Effects Decision Aid
IWS	Internet Workstation

IXP	Information Exchange Plan
JCDB	Joint Common Database
JMTK	Joint Mapping Tool Kit
JSTARS	Joint Surveillance Attack Radar System
JVMF	Joint Variable Message Format
KB	Keyboard Unit
kbps	kilobytes per second
Km	Kilometer(s)
LAN	Local Area Network
LAT	Latitude
LDAP	Lightweight Directory Access Protocol
LDIF	LDAP Data Exchange Format
LEN	Large Extension Node
LLTR	Low Level Transit Route
LOGPAC	Logistics Package
LOGSITREP	Logistical Situation Report
LONG	Longitude
LOS	Line-of-Sight
LSD	Large Screen Display
LW	Land Warrior
MA	Machine Acknowledge
mbps	megabytes per second

MC4	Medical Communication for Combat Casualty Care
MCOO	Modified Combined Obstacle Overlay
MCS	Maneuver Control System
MCS-L	Maneuver Control System - Light
MDMP	Military Decisionmaking Process
MET	Meteorological
METT-TC	Mission, Enemy, Terrain, Troops, Time, Civilians
MHT	Message Handling Table
MIB	Management Information Base
MICLIC	Mine-Clearing Line Charge
MILSTAR	Military Strategic, Tactical Relay
MMI	Man Machine Interface
MOS	Military Occupational Specialty
MS	Microsoft
MSE	Mobile Subscriber Equipment
MSG	Message
MSR	Main Supply Route
MST	Maintenance Support Teams
MSTF	Mission Support Training Facility
MTF	Medical Transfer Facility
MTI	Moving Target Indicators

MTOE	Modified Table of Organization and Equipment
MTP	Mission Training Plan
MTS	Management Tracking System
MUL	Master Unit List
NAI	Named Area of Interest
N/A	Not Applicable
NBC	Nuclear, Biological, Chemical
NC	Node Center
NCOIC	Non-Commissioned Officer-in-Charge
NCS	Net Control System
NDL	Name Distribution List
NET	New Equipment Training
NETT	New Equipment Training Team
NFA	No Fire Area
NIMA	National Imagery and Mapping Agency
NIPR	Non-Classified Internet Protocol Router
NMT	NTDR Management Terminal
NTDR	Near Term Digital Radio
OA	Operator Acknowledge
OIC	Officer In Charge
OPCON	Operational Control
OPLAN	Operations Plan

OPORD	Operations Order
OPTEMPO	Operating Tempo, Operations Tempo
OR	Operator Response
O/R	Originator/Recipient
ORD	Operational Requirements Document
OTH	Over-the-Horizon
PCC	Pre-Combat Checks, Pre-Command Course
PCI	Pre-Combat Inspection
PDA	Personal Digital Assistant
PDS	Personnel Daily Summary
PEO C3(T)	Program Executive Officer, Command, Control, Communications (Tactical)
PIR	Priority Intelligence Requirement
PLGR	Precision Lightweight GPS Receiver
PM	Program Manager
PMO	Provost Marshal’s Office
POD	Port of Debarkation
POI	Program of Instruction
QRMP	Quick Response Multicolor Printer
RAU	Remote Access Unit
RFI	Request for Information
RI	Relevant Information

ROE	Rules of Engagement
RS	Receive Suite
R&S	Reconnaissance and Surveillance
RWS	Remote Workstation
SAAFR	Standard Army Aviation Flight Routes
SAR	Synthetic Aperture Radio
SARSS	Standard Army Retail Supply System
SATCOM	Satellite Communications
SCAMP	Single Channel Anti-Jam Manportable Terminal
SEN	Small Extension Node
SICPS	Standardized Integrated Command Post System
SIDPERS	Standard Installation/Division Personnel System
Sim/Stim	Simulation/Stimulation
SINCGARS	Single Channel Ground and Airborne Radio System
SIP	System Improvement Program
SIPR	Secure Internet Protocol Router
SITREP	Situation Report
SITTEMP	Situation Template
SMART-T	Secure Mobile Anti-jam Reliable Tactical-Terminal
SME	Subject Matter Expert
SMTP	Simple Mail Transfer Protocol
SOP	Standard Operating Procedure

SPO	Security, Plans, and Operations
SR	Send and Receive
S/R	Situational Awareness/Replication
SU	Situational Understanding
TACELINT	Tactical Electronic Intelligence
TACSOP	Tactical Standard Operating Procedure
TAI	Target Area of Interest
TAIS	Tactical Airspace Integration System
TAM	Technical Assessment Meeting
TCD	Tactical Communications Diagram
TEED	Tactical End to End Encryption Device
THSDN	Tactical High Speed Data Network
TI	Tactical Internet
TIM	Tactical Internet Manager
TIRS	Terrain Index Reference System
TOC	Tactical Operations Center
TPFDD	Time Phased Force Deployment Data
TPIO-ABCS	TRADOC Program Integration Office - Army Battle Command System
TPN	Tactical Packet Network
TRADOC	Training and Doctrine Command
TRN	Time Rule Name

TSM	TRADOC System Manager
TSP	Training Support Package
TTP	Tactics, Techniques, and Procedures
TUAV	Tactical Unmanned Aerial Vehicle
UIC	Unit Identity Code
UMCP	Unit Maintenance Collection Point
UMT	Unit Ministry Team
UNIX	Universal Network Information Exchange
UPS	Uninterruptible Power Supply
URN	Unit Reference Number
USMTF	United States Message Text Format
UTO	Unit Task Organization
v, V	Version
VHF-FM	Very High Frequency-Frequency Modulation
VTC	Video Teleconference
WAN	Wide Area Network
WARNO	Warning Order
WIN	Warfighter Information Network

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