Army Battle Command Systems (ABCS)
Smart Book
Overview
Version 6.2.x

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Preface

This document will be posted to the Warrior-T Web site and disseminated for DCX Phase II beginning 20 Aug 2001. It is a compilation of data from many sources including Program Managers (PMs), TRADOC System Managers (TSMs), TPIO-ABCS, proponents and the Central Technical Support Facility (CTSF). It is current as of the available data at the time of publication. It will be updated as systems mature and information changes. The most current data can be accessed on-line on the Warrior-T web site and through links to other responsible sites.

The document is part of a set of documents that is comprised of the following:

- An introduction and description of ABCS capabilities and functions as a system of systems (the essence of digital command and control).
- Five documents that describe Army Tactical Command and Control Systems (ATCCS) capabilities and functions individually.
- A description of Force XXI Battle Command Brigade and Below (FBCB2) functions and capabilities.
- Digital communication architecture with its sub-components.
- Digital Topographical Support System (ABCS support system) capabilities and functions.
- Topical annexes that further elaborate on digital focus and methodology.

(Refer to the overview table of contents and the table of contents of each document for further specifics.)

These documents can be printed as one document or viewed / printed separately based upon user requirements. The ABCS Smart Book is available for viewing and download on the Warrior-T Homepage in the Digital Unit Training Products section at http://fioasat.hood.army.mil

Submit questions or comments about this document to Warrior-T, commercial (254) 532-8321, ext 2332 or DSN 738-4035, ext. 2332. Mailing address is Warrior-T, Bldg 28, CTSF, 53d and North Ave, Ft Hood, TX 76544.

Chapter 1. Army Battle Command System (ABCS)

1-1. Purpose

Leaders, managers, and executors in digital units have only just begun to realize the impact of the digital revolution. Most realize that continued improvements in technology will enhance mission planning, rehearsal, and execution. The issue is that the Army must concurrently establish doctrine and tactics, techniques and procedures to aid training to achieve those enhancements. One way the Army can minimize the effect of spiraling digital hardware and software changes and the effects of personnel transition is to enable information flow among soldiers, units, installations, institutions, and developers. Information flow will maximize the learning curve and capitalize on lessons learned. Using the same concepts that digitization brings to the battlefield, materiel, combat, doctrine and training developers in conjunction with digital units must network information, collaborate on objectives and insure information is readily accessible to insure situational awareness. Quick access to an updated, centralized information reference source is essential for institutional training, new equipment training, sustainment training, and employment of the Army Battle Command System with its supporting sensors and communication systems that are integral to the digitized force.

This ABCS Smart Book is one such source of centralized information with many internal references that will enable the reader to further access relevant information by topic.

1-2. Overview

ABCS enhances the basic functions that staffs and subordinate leaders perform in support of the commander:

- Provide information
- Make estimates
- Make recommendations
- Prepare plans and orders
- Supervise execution of decisions

ABCS brings more information to the decision cycle that must be filtered, fused, and focused by commanders and staffs into battlefield visualization and situational understanding. The commander uses this visualization and understanding to apply combat power to achieve situational dominance.

ABCS is a faster, real-time means of exchanging information. ABCS push and pull information provides more accuracy than previous capabilities and emphasizes multi-echelon collaboration and de-emphasizes physical coordination. It creates a need for technical staff competence in addition to tactical proficiency. Collaboration decreases the planning time for the MDMP process, facilitates abbreviated and accelerated decision making processes and increases time for rehearsal and execution, allowing combat units to operate inside the threat's decision making cycle and act / react faster than he can.

ABCS also enables the commanders and staffs to conduct execution decision making by facilitating transmission and understanding of the commander's intent and by rapid coordination across echelons and to the platform level for execution of planned or realized branches and sequels to the basic plan.

With digitization, the commander and his staff have at their disposal a complex array of sensors and collection platforms, data sources and globally distributed expertise, dynamically updated and integrated models of the battlefield situation, and a rich variety of automated planning and decision aids. These information resources are connected to high-precision weapons and highly maneuverable small-unit forces—networked in a distributed, real-time, information environment. Success depends on being able to leverage this information environment to rapidly understand and precisely control the battlefield.

The Army Battle Command System (ABCS) is designed to facilitate command and control (C2). ABCS will assist the commander in exercising command and control of available forces to accomplishment a mission. It will allow him to "see and understand" his battlespace and gain situational dominance on the Army XXI battlefield. ABCS will not change the essence of command and its elements—authority, vision, decision-making, and leading. The commander will simply have a greater presence on the battlefield. Increased situational awareness (SA) will provide greater clarity to his vision, and collaborative planning tools and parallel processes will help refine the decision-making processes. ABCS will provide immediate access to situational updates and execution information and allow the commander to transmit situational understanding and execution from his location on the battlefield—to create his vision (or validate it if executing operations), make decisions, inform, and lead. ABCS will assist 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. ABCS Description

The ABCS includes command and control systems to support decision makers from platform level to theater level. The ABCS has several informational components. (1) GCCS-A is the Army component of the Global Command and Control System (GCCS) and supports warfighter information and understanding at the theater level, including the joint environment. (2) The Army Tactical Command and Control System (ATCCS) is the integration of five primary functional area control systems providing situational information and decision support to the battlefield operating systems (BOS) from corps to battalion echelons. (3) Force XXI Battle Command Brigade and Below (FBCB2) provides access from brigade to the individual platform. (4) Other ABCS Systems including the Digital Topographic Support System (DTSS) providing geospatial data, the Integrated Meteorological System (IMETS) providing weather data and the Tactical Airspace Integration System providing airspace planning and management tools. ABCS is supported by a robust backbone of communications architecture.

1-4. System Components

The principal ABCS components fall into two major areas, communication and automation.

- Communication and information enablers are
  - Army Data Distribution System (ADDS)
  - Warfighter Information Network-Tactical (WIN-T)
  - Combat Net Radio (CNR)
  - Military Satellite Communications (MILSATCOM)

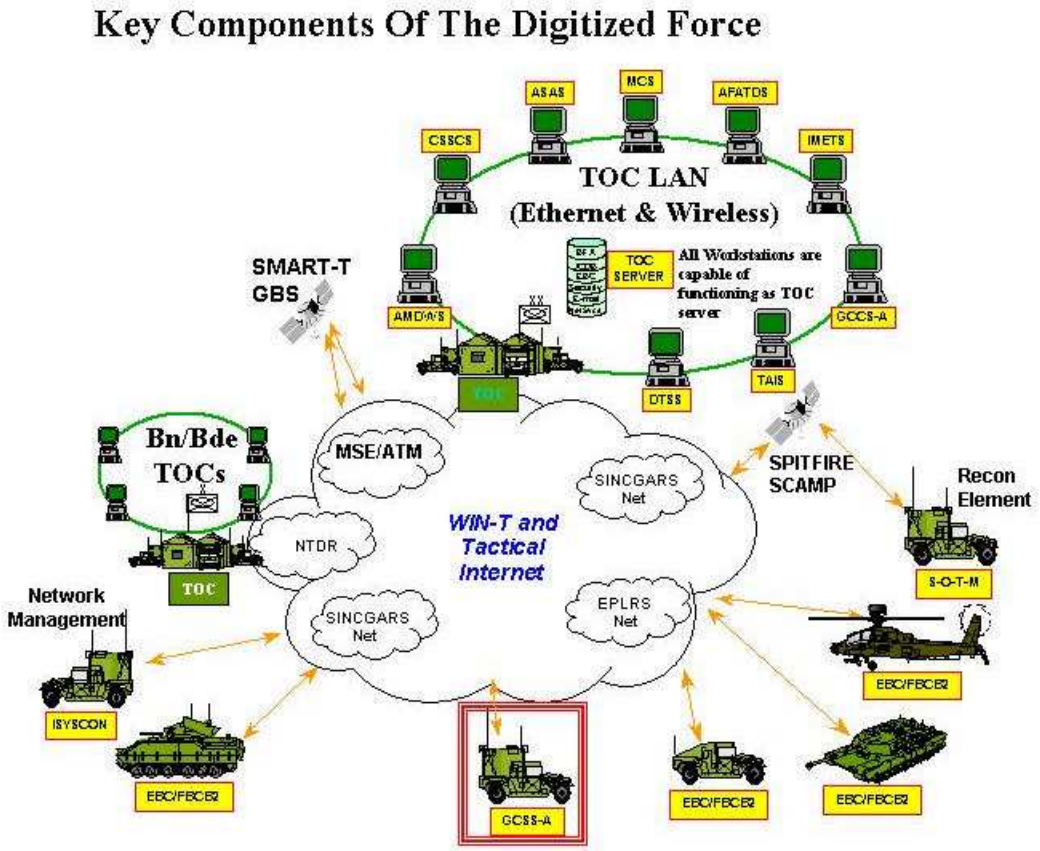
- Automation components are
  - GCCS-A
  - Army Tactical Command and Control System (ATCCS)
    - Maneuver Control System (MCS)
    - Advanced Field Artillery Tactical Data System (AFATDS)
    - Air and Missile Defense Work Station (AMDWS), part of the Forward Area Air Defense Command, Control, Computers, and Intelligence (FAADC3I) system
    - All Source Analysis System (ASAS)
    - Combat Service Support Control System (CSSCS)
  - Force XXI Battle Command Brigade and Below (FBCB2)
  - Digital Topographic Support System (DTSS)
  - Integrated Meteorological System (IMETS)
  - Tactical Airspace Integration System (TAIS)

- These systems operate in a distributed computing environment (DCE) that supports client / server data exchange within a command post (CP) or cell and facilitates sharing of information between CPs and cells via US Message Text Format (USMTF) messages.

- Connectivity is provided by tactical communications systems: MSE, 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.

- Additional systems interfacing with ABCS include the Army Airborne Command and Control System (A2C2S), the Tactical Airspace Integration System (TAIS), the Battlefield Awareness Data Dissemination (BADD) System (based on direct broadcast system technology), the Common Ground Station (CGS) and the Battlefield Planning and Visualization (BPV) system and Battlefield Command on the Move (BCOTM).

1-5. System Components Description



a. Communication and Information Enablers

- **Warfighter Information Network (WIN)**

  WIN will modernize and replace the current Mobile Subscriber Equipment (MSE) and TRI-TAC systems in corps, divisions, and EAC. It will be deployed to support warfighters within multiple theaters, corps, and division, down to maneuver brigade and separate maneuver battalion CPs. Commonality of equipment at all tactical levels will facilitate the formulation and use of task forces as fighting or supporting units. WIN will allow seamless flow and interoperability among Joint Technical Architecture-Army (JTA-A) compliant sustaining base systems that produce, use, or exchange information electronically. It is a terrestrial transport communication and information system, based on communication technology, which will provide simultaneous voice, data, and video communication services at all levels of security.

- **Availability**

  The WIN in its final configuration will not be fielded until 2006. Some parts of the objective system will be available for DCX Phase II—ISYSCON, TIM, HCLOS,

SMART-T, SCAMP, and Spitfire, which are described in the Communication Systems Smart Book.

b. Automation Components

- **Global Command and Control System-Army (GCCS-A)**

  The GCCS-A is the Army component of the GCCS. It provides a suite of modular applications that includes logistics, medical, personnel, Theater Army special operations, mobilization, deployment, status of readiness and training, and transportation. It also provides the primary link to joint and combined systems, such as the Air Force Tactical Air Control System (TACS), the Automated Planning System (APS), and the Navy Joint Maritime Command Information System (JMCIS). GCCS communication infrastructure provides multilevel source data and key information databases over the Wide Area Network (WAN) and gives the commander a common view of the battlespace, through the National Command Authority (NCA) operations. GCCS provides a single, joint C2 system from the battalion commander to the Chairman, Joint Chiefs of Staff, helping to synchronize and maintain dominant battlefield awareness over widely dispersed locations. GCCS-A combines communication systems at echelon above corps (EAC). It is an aggregate of:

  - World Wide Military Command and Control System (WWMCCS).
  - Standard Theater Command and Control System (STCCS).
  - Echelon Above Corps (EAC) portion of Combat Service Support Control System (CSSCS).

- **Army Tactical Command and Control Systems (ATCCS)**

  ATCCS is linked to GCCS-A and FBCB2 (Force XXI Battle Command Brigade and Below), providing seamless connectivity from battalion to corps. ATCCS is made up of five primary and several support systems:

  - **Maneuver Control System (MCS)**

    MCS provides tactical commanders and staffs with an automated, near-real time view of the battlefield for planning, coordinating, monitoring, and controlling tactical operations. The MCS operator can tailor the applications to display the picture of the battlefield he chooses. The battlefield view is derived from data fed by automatic information provided by a combination of both local and remote ABCS systems. MCS is the integral system in ATCCS. Its primarily use is for creating and sending OPORDS throughout the chain of command. It is also equipped with digital collaborative tools that commanders and staffs can use to plan future operations and review past operations.

  - **All Source Analysis System (ASAS)**

    ASAS automates Intelligence and Electronic Warfare (IEW) operations at the operational and tactical levels. It allows the analyst to quickly correlate large

volumes of information. Once correlated, the analyst has the ability to use a variety of software tools to transform raw data into finished intelligence products for dissemination from theater to platform level.

- **Advanced Field Artillery Tactical Data System (AFATDS)**

  AFATDS is the fire support component of ABCS and provides automated decision support for fire support (FS), to include joint and combined fires. AFATDS supports the planning, coordination, control, and execution of close support, counter fire, interdiction, deep operations, and suppression of enemy air defense. It is a single, integrated fire support asset manager. It provides decision aids and an information system for the synchronization of all types of fire support means.

- **Air-Missile Defense Planning and Control System (AMDPCS)**

  This system is the air defense component of ABCS and is used to provide third dimension situational awareness. The Air-Missile Defense Planning and Control System (AMDPCS) consists of two subordinate systems, the Forward Area Air Defense Command, Control and Intelligence system (FAADC2I) and the Air Missile Defense Work Station (AMDWS). AMDPCS integrates air defense, fire units, sensors, and C2 centers into a coherent system capable of defeating / denying the low altitude aerial threat. AMDWS is the ADA tool that provides air and missile defense plans and air situational awareness to ABCS and commanders at all echelons. It is the staff planning and situational awareness tool used from the ADA battery to theater echelons. It also is the air missile defense planning and control link to joint / allied C2 systems. It provides direct connectivity to and interoperability with the Joint Defense Planner, a theater level air and missile defense-planning tool.

- **Combat Service Support Control System (CSSCS)**

  The Combat Service Support Control System (CSSCS) is the logistics component of ABCS and provides critical, timely, integrated, and accurate automated logistical information. The CSSCS is designed to meet the commander's need for command and control logistics information. Army units use it to collect, consolidate, collate, and present CSS information in formats that support the information requirements of commanders and staffs at tactical and operational levels. CSSCS provides a common logistics picture to other ATCC systems. It displays and reports the CSS commander's direct support and organizational logistical posture and satisfies the maneuver commander's CSS information needs.

- **Other ABCS Systems**

  - **Digital Topographic Support System (DTSS)**

    DTSS is an automated battlefield system that provides geospatial data in digital format for use on ABCS systems. The Topographic Terrain Teams located at brigade, division, corps, and EAC use the DTSS capability to

perform automated terrain analysis and prepare geospatial products within the timeframes required to support tactical combat operations. The DTSS provides warfighters and their commanders with a higher resolution of battlefield terrain visualization through advanced computing, printing, and scanning of geospatial products. The DTSS provides a means of producing a variety of tactical decision aids using terrain analysis models and high-resolution imagery. The system also provides the capability to produce multiple, full color hardcopy products of the battlefield terrain. Maps not otherwise available in digital format may be scanned in full color. DTSS products are disseminated to the battalion using the Global Broadcasting System (GBS), the Common Tactical Picture application (depending on bandwidth), a web site, or "hard copy" (disk, overlay or geospatial printout).

- **Integrated Meteorological System (IMETS)**

  The IMETS provides high-resolution current and prognostic meteorological data and weather effects. It is designed to display and analyze weather products and provide general weather forecasting, weather warnings, and weather affects analysis. It provides the Integrated Weather Effects Decision Aid (IWEDA) client to AFATDS, ASAS, CSSCS, AMDPCS, and MCS for determining and displaying weather impacts on any of 71 weapons systems over space and time. IMETS is the division meteorological component of the intelligence and electronic warfare (IEW) sub element of the ABCS. It provides commanders at all echelons down to maneuver battalions with an automated weather system to receive, process, and disseminate weather observations and forecasts. IMETS provides first-in weather support to contingency forces, tailored weather information for deep fires and precision munitions, and weather environment affects decision aids for the planning and execution of maneuver and support.

- **Tactical Airspace Integration System (TAIS)**

  TAIS provides the battlefield with automated Army Airspace Command and Control (A2C2) planning at the division level. It enhances A2C2 execution and improves the theater and corps / division air traffic services. It offers a versatile airspace management system and provides three- and four-dimensional (altitude and time) battlespace synchronization.

- **Force XXI Battle Command Brigade and Below (FBCB2)**

  The Force XXI Battle Command Brigade and Below (FBCB2) is used at the brigade level and below and designed to provide on the move, real-time and near-real time situational understanding. FBCB2 is an essential sub-element of ABCS. It feeds the ABCS common database with automated positional friendly information and current tactical battlefield geometry for friendly and known or suspected enemy forces. It integrates with each of the ATCCS systems, providing a battle command capability. The Lower Tactical Internet (TI) and Warfighter Information Network-Tactical (WIN-T) support FBCB2 communication.

1-6. ABCS 6.2.x Software Architecture

A significant software development and integration effort is ongoing to enhance ABCS as it evolves from its current baseline. Version 6.2.x in July 2001 provides new and enhanced capabilities from the previous Version 6.2 "go-to-war" package. Software continues to evolve through multiple enhancements called patches. This accounts for the "x" in the version title. For this overview, only the main features that are expected to translate across versions will be addressed.

a. Software Architecture

Software architecture enhancements in ABCS focus on finalizing ABCS server allocation, optimizing client-server operations, integrating Embedded Battle Command (EBC) to achieve interoperability with lower echelon systems, and providing the Common Tactical Picture (CTP) capability. Version 6.2.x focuses on continuity of operations and other aspects resulting in an ABCS that is warfightable, trainable, and sustainable. Significant to the user are new procedures for disseminating data and increased computing speed for accessing data and graphics.

b. EBC-ABCS Integration

The objective of this effort is to ensure that Force XXI Battle Command Brigade and Below applications / systems and EBC / ABCS applications and subsystems can exchange Joint Variable Message Format (JVMF) messages. Both multicast and Unicast JVMF message exchange capabilities are included in Version 6.2.x, as well as other enhancements to include implementation of a communications message processor.

c. Communications Media

The movement of large quantities of digital information across the battlefield places an enormous demand on the radio bandwidth available in the tactical environment. While the use of techniques such as bit-oriented messages and data compression increases efficiency of the electronic spectrum, these techniques alone will not provide the flexibility and effectiveness required of the communications architecture. Consequently, the digital divisions will employ the Warfighter Information Network (WIN) for communications. Two of the major components of WIN are the tactical Internet (TI) and the WIN-Tactical (WIN-T). Within the WIN architecture, the TI is used at brigade and below, and at mobile entities at higher headquarters that use Single Channel Ground Airborne Radio (SINCGARS) or the Enhanced Position Location Radio System (EPLRS) for data exchange. The WIN-T system is similar to the Internet used on home PCs. The user simply enters the destination(s) for traffic and transmits without having to switch frequencies or worry about the type of transmitter.

Similar to the commercial Internet, the WIN infrastructure resolves this issue and swiftly transmits the information to its proper destination. Several improvements are being made relative to WIN. Nonrouteable gateways have been replaced with routable interface devices. Ultimately, digital divisions will have one integrated WIN where user applications will be optimized. In effect, information can go directly from any ABCS / BOS user (host) to any other ABCS / BOS user.

d. Integrated Systems Control

Key to the success of digital divisions is the availability of network management capabilities, including tools to manage associated command, control, and communications systems. One of these tools, Integrated System Control (ISYSCON), provides an Army-wide family of tools to meet digital division network management requirements. Specifically, ISYSCON is used in network planning and engineering, battlefield spectrum management, COMSEC management, wide area network (WAN) management, and signal command and control management.

1-7. Network Architecture and Tactical Internet (TI)

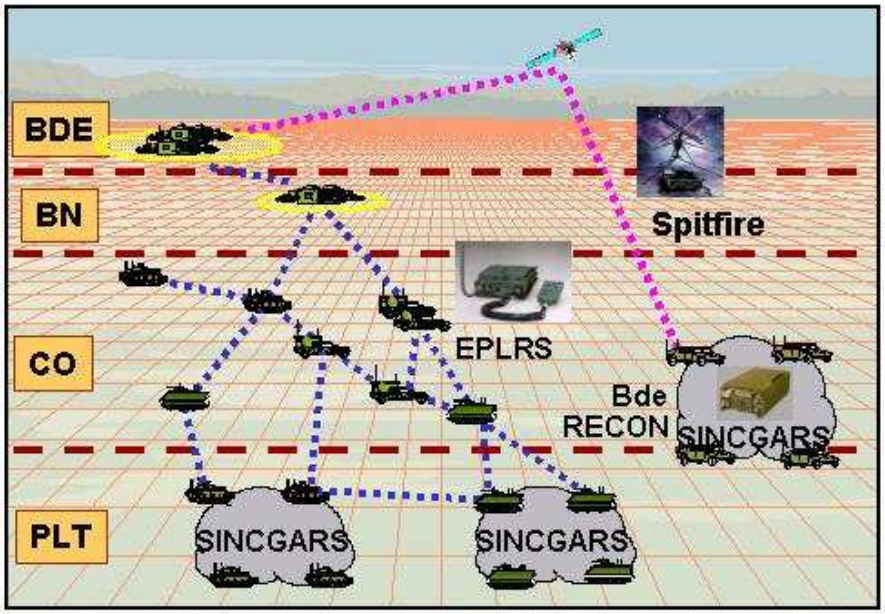
a. Overview

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 situational awareness (SA) and C2 data. The TI must deliver messages reliably, despite mobility of units, battle stress, obscuring terrain, enemy interference, destruction of command posts, loss of key elements, and replacement of individual platforms. The TI consists of two primary segments, a lower TI for battalion and below and WIN-T (or upper TI) for battalion and above.

b. Lower TI Communications

Digital communications capability for brigade and below has three primary components-

- **Enhanced Position Locating Radar System (EPLRS)**--data only communication (platform position, network coordination).

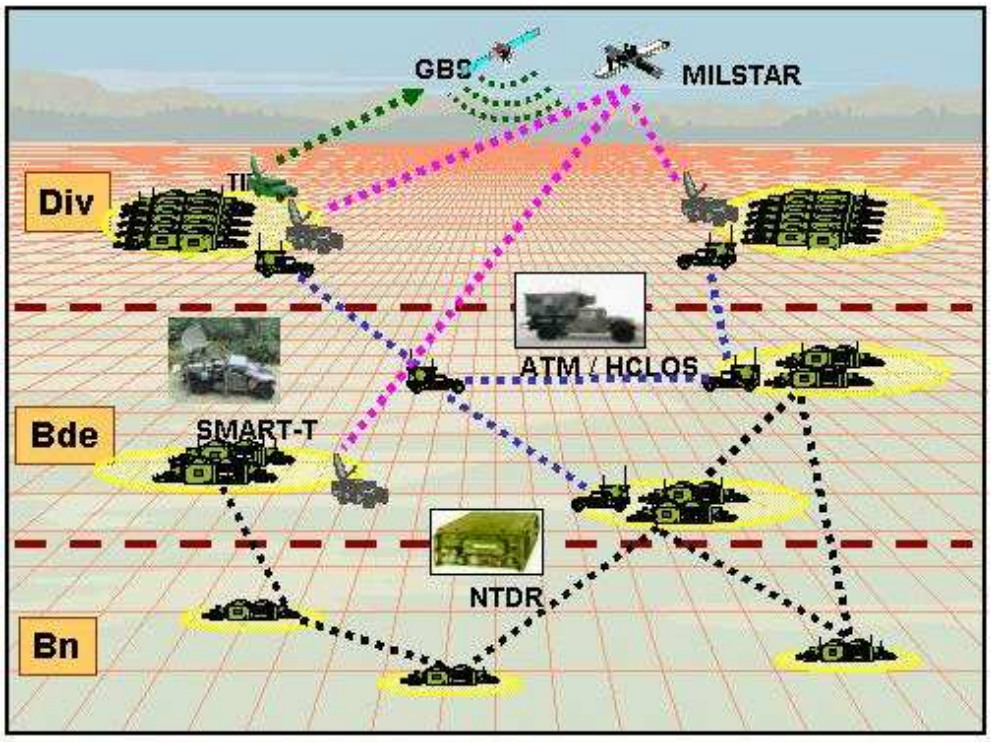


Lower Echelon Communications

- **SINCGARS--**voice and data communications. **Internet Controller (INC)**--routing and interface capability.

NOTE. Not all FBCB2 platforms are equipped with EPLRS. The non-EPLRS platforms pass FBCB2 data via the INC to SINCGARS to their EPLRS servers. Every platform is associated with an EPLRS server through which all situational awareness (SA) and C2 data is routed. Platforms consistently evaluate the quality of their server and will 'jump' to an alternate server if the primary is degraded. **If both servers are degraded, the user must execute a Net Join from the FBCB2 "Apps" menu** (basically asking permission to join another net that has a functioning EPLRS). Not all vehicles have FBCB2. Vehicles without it require verbal reporting and manual tracking.

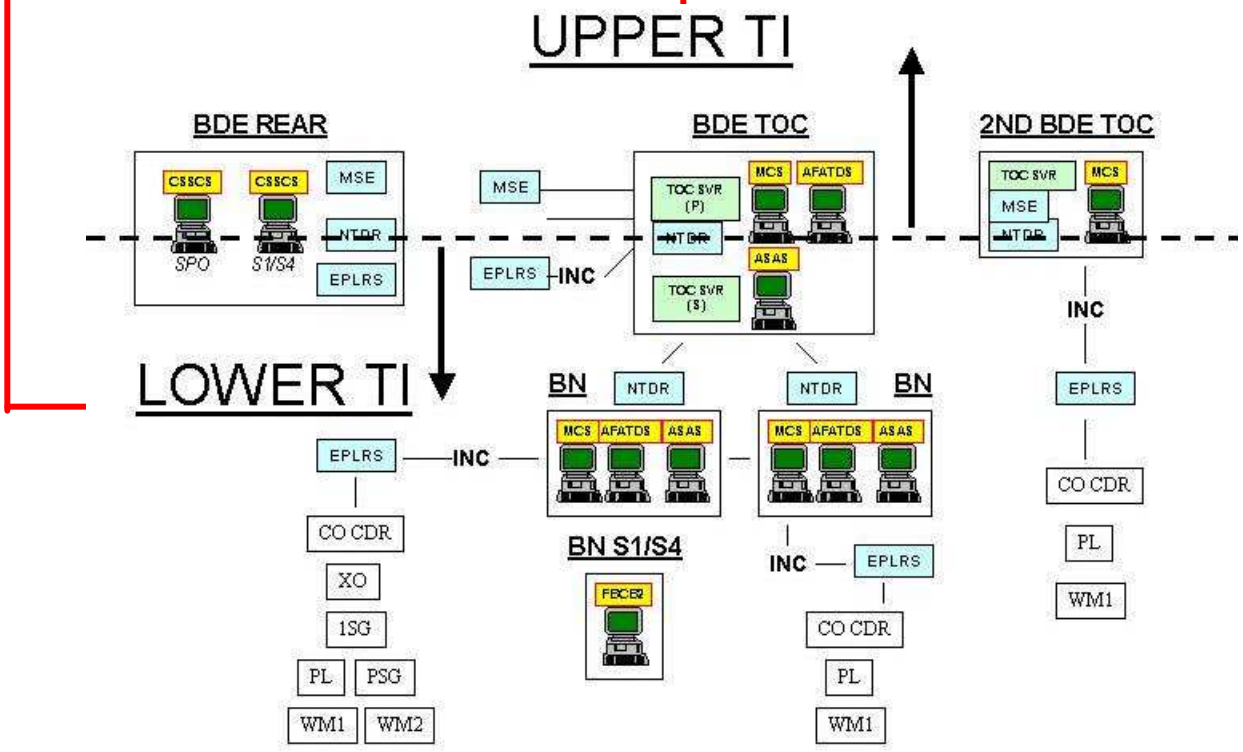
c. Upper TI (WIN-T) Communications



Upper Echelon Communications

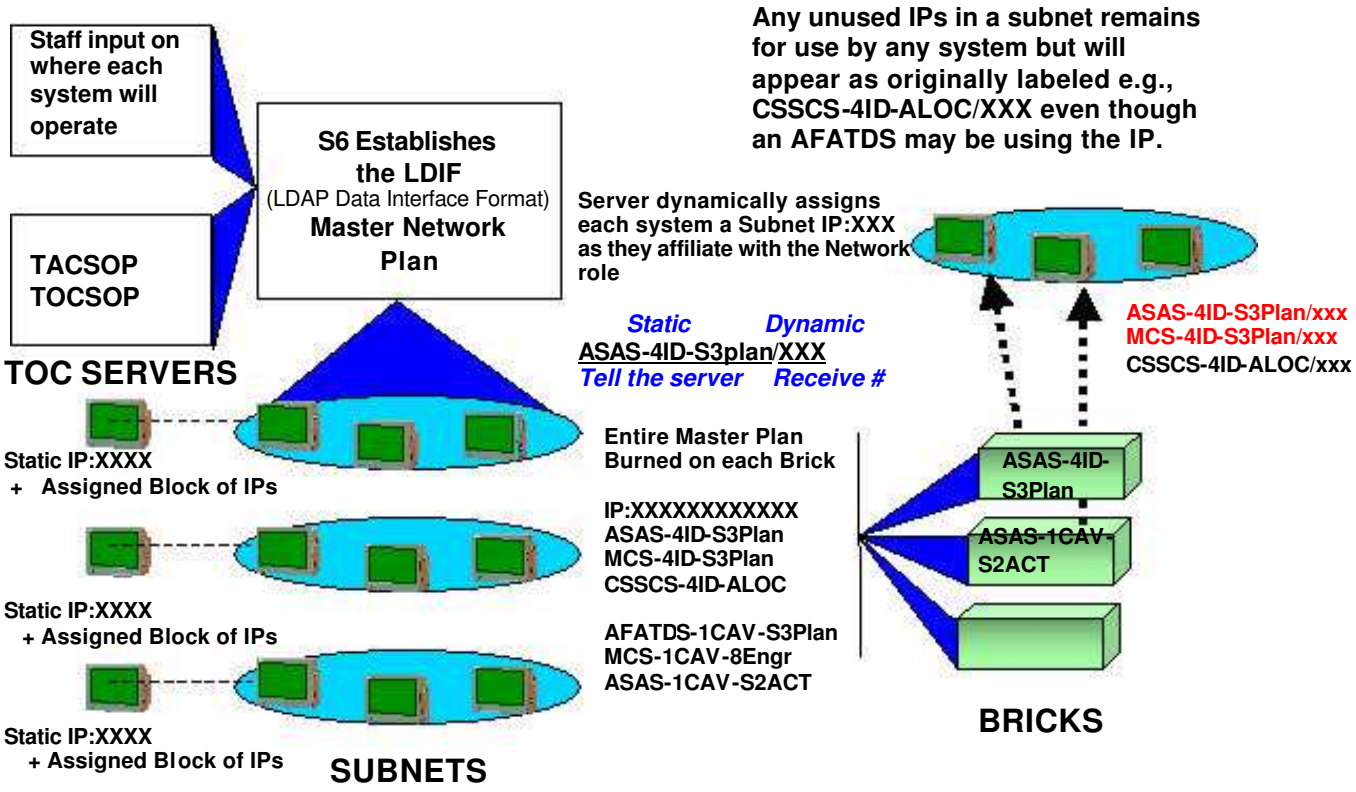
WIN-T (MSE and NTDR) systems provide interface to the tactical Internet in the battalion and brigade CPs, allowing dissemination of SA and C2 data.

- At the battalion CP, the TOC router interfaces with a TOC INC, the TOC LAN, and Near Term Digital Radio (NTDR).
- At the brigade CP, the TOC router interfaces with a TOC INC, the TOC LAN, NTDR, and MSE.



d. Command and Control Registry (C2R)

The C2R is established based upon the LDIF (Lightweight Directory Access Protocol Data Interchange Format). Think of the LDIF as a master network plan. If all users are not using the same version of the plan, the system will not work. Thus, it is critical during the planning phase that network users document to their S6 and G6 all possible locations where their workstations could possibly be located during the operation. The LDIF is burned on the computer hard drive (brick) based on the network plan developed by the G6. Basically, it is the map of all the computers in the network and what subnet they belong to. Each subnet is assigned a block of IP addresses to be used statically and dynamically. The ABCS server and other network devices will be assigned a static IP address. All ABCS workstations [clients] will be dynamically assigned IP addresses by the ABCS server as they affiliate with the network.



Any computer on a subnet may act as the server. [NOTE. It is important when bringing up the network that the designated server comes up first, because the first system to affiliate with the router becomes the server. Thus, if a system that was intended to be a client is initialized with the network before the server, it will be given the server IP and assume the role of ABCS server.] There is also merit in dictating a TOC bootup plan to facilitate affiliation time. Each system will receive the same IP address it had before if it boots in the same order. Once a system affiliates with the network and ABCS server, the IP address and other configuration information it receives will be stored in its C2R. If the system being initialized has previously

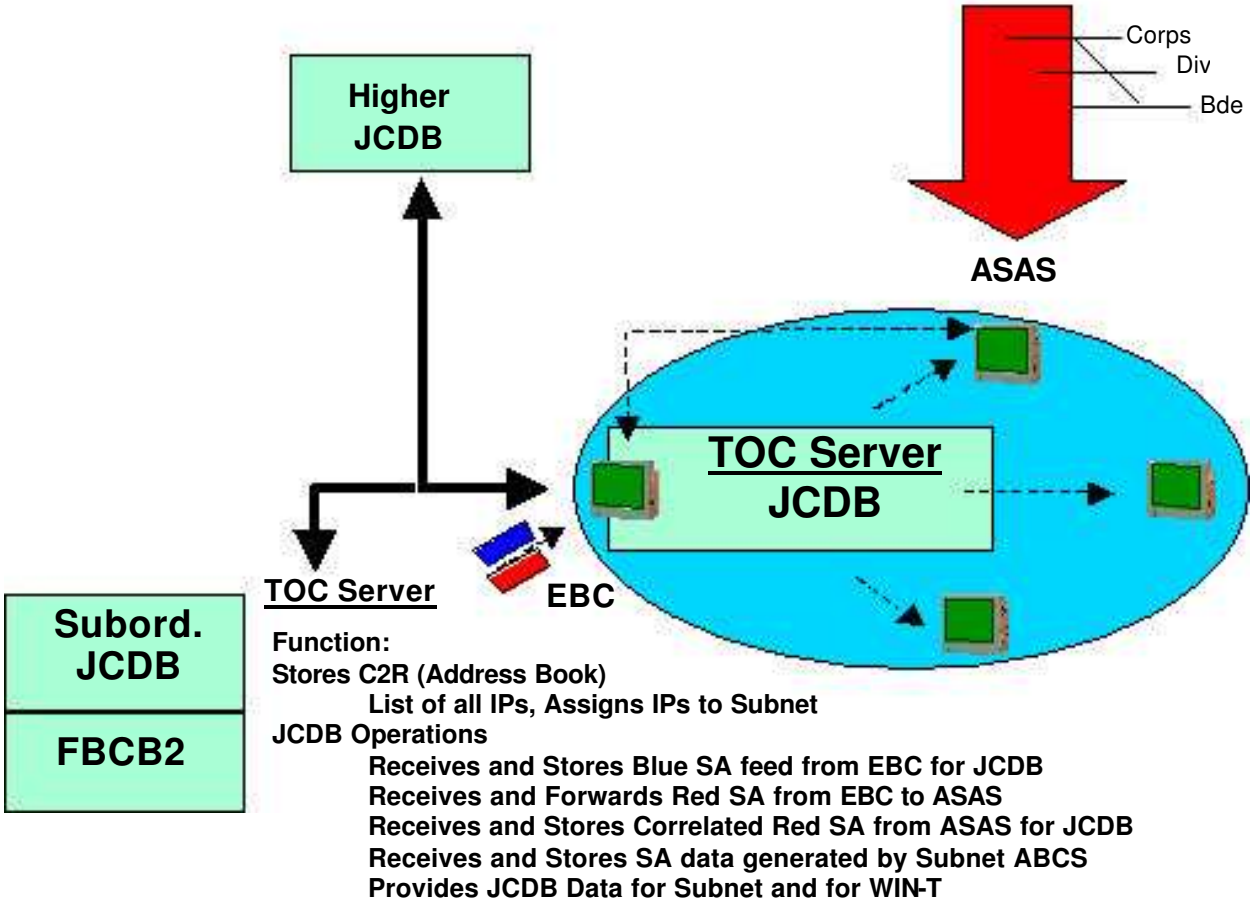
served as an ABCS server or has been used on a different subnet, then a potential IP address conflict could occur if the computer system C2R was not previously purged. In ABCS version 6.2.x, this is done by selecting yes to the "Do you want to reconfigure?" question the system asks during system initialization. Once yes has been selected, the operator will then have to properly answer a series of logic questions to purge the C2R. When this is complete, the system will continue to initialize. If a computer needs to make an unplanned move from one subnet to another, there are two ways to do it.

- **Field Expedient**

  The most field expedient way is to assign the ABCS workstation an unused IP address / system identification that is already in the LDIF. For example, you wish to move a CSSCS workstation from its current, planned-for subnet to a different, unplanned-for subnet. The other subnet does not have any spare CSSCS IP addresses available, but does have a spare ASAS address available (ASAS-4ID-PLANS3). You would assign your CSSCS box the ASAS address. It would now appear to the network as an ASAS box. It will still function as a CSSCS box, but must be addressed by its ASAS short title. Thus, all users on the network will need to be notified of this anomaly and adjust their message handling tables (MHTs) as necessary.

- **Update LDIF**

  Update the LDIF on *every* computer in the network, not just the affected subnet. Additionally, you must update every network router and switch configuration.



e. TOC Server

TOC servers and backup servers are located at each echelon TOC from battalion up. The TOC server stores situational awareness (SA) data for the Joint Common Database (JCDB). The JCDB provides a repository of C2 reference information (C2R, commonly known as the address book). Embedded Battle Command (EBC) is the blue SA data source for the TOC server as well as the bottom-up feed for red SA data. The TOC server feeds blue SA to the JCDB and routes red spot reports to the ASAS. Correlated red SA is then pulled from ASAS by the TOC server. The TOC server incorporates red SA into the JCDB and provides blue and red data over WIN-T to all battalion and above CPs.

f. Embedded Battle Command (EBC) and Situational Awareness Data

EBC sends and receives situational awareness data (and command and control data) to and from the TOCs (including ASAS). EBC is (or will be) hosted on all the TOC BFA systems, but is only started on whichever BFA happens to be the TOC server. The primary function of EBC is to provide a communications path to and from the FBCB2 systems for situational awareness (SA) data (the current red and blue pictures). FBCB2 systems are used on most Army vehicles to send and receive situational awareness data to and from the TOCs, just as EBC does, except that the

systems have a user front end (input and send function) whereas EBC automatically draws and sends information to the TOCs and FBCB2s from the JCDB.

- **EBC Red Situational Awareness Data**

  A process hosted on ASAS called the Red SA Client is used to send the red situational data from ASAS (unit / equipment data in the ASAS Consolidated Database (ASCDB)) to the EBC. The EBC receives the data and reformats it into a JVMF data message. The JVMF data is then broadcast to all FBCB2 systems in the same brigade as the EBC. The FBCB2 operator uses the current Enemy Interoperability Message to send ASCDB data to EBC (automatically) and may also use the Enemy Interoperability Message from the Map to send enemy data (interactively).

- **EBC Blue Situational Awareness Data**

  EBC is also the method by which the blue situational data is received in the TOC. Blue data, which consists mostly of location reports, is sent from the FBCB2 systems to the EBC (on the TOC server). EBC forwards the blue situational data to two servers in the TOC (both located on the TOC server system only) called the Blue Agent and the Live Feed Server. The Blue Agent receives blue updates from EBC at approximately 5-minute intervals and posts the data to the JCDB. The data is then moved around to other TOC systems using a database replication mechanism. The user can view the blue JCDB data using CTP Overlay Explorer filters. The Live Feed Server receives updates from EBC at approximately 15-second intervals. Live Feed Server updates can be received by all TOC BFA systems by starting a Live Feed Client process. The Live Feed Client automatically creates an Overlay Explorer overlay for live feed and the user will see blue updates automatically posted to JMTK / CTP / Overlay Explorer. However, live feed is not posted to the JCDB. The user starts the Blue Agent, Live Feed Server, and Live Feed Client on the TOC server.

1-8. Establish the Warfighter Information Network (WIN)

a. Digital Connectivity and Checks

ATCCS must be interconnected not stovepiped to realize the power of digital C2. Connectivity and checks is no small matter as it entails many communication tasks - designating the location of the MSE small extension node (SEN) site and locations for J-1077 MSE voice telephone junction boxes; installing commercial and tactical voice telephone networks; connecting fiber optic and category 5 cable to support the CP local area and wide area networks (LANs / WANs); establishing the CP intercommunication system (ICS) from tent interface panels (TIPs) to touch screen access units (TAUs); erecting CP antenna systems; establishing required staff section combat net radio (CNR) voice and data networks; initializing designated NTDR data radios and establishing required Spitfire TACSAT networks; establishing network control by initializing and configuring network routers, switches, near term digital radios (NTDRs), and tactical operation center (TOC) Internet controllers (INCs) using Tactical Internet Manager (TIM) and NTDR management terminal (NMT); establishing Army Battle Command System (ABCS) connectivity; and finally

establishing the command information center (CIC), battlefield video teleconference (BVTC) system and S6 help desk.

The brigade CPs proof network connectivity by sending and receiving messages with higher, lower, and adjacent units via the associated messaging equipment [voice mobile subscriber equipment (MSE), frequency modulation (FM), amplitude modulation (AM), and tactical satellite (TACSAT) radios and data Army Battle Command System (ABCS), Force XXI Battle Command Brigade - Below (FBCB2) platforms, single channel ground and airborne system advanced system improvement program (SINCGARS ASIP), enhanced position location reporting system (EPLRS), near term digital radio (NTDR), global broadcast service (GBS), and mobile subscriber equipment (MSE) networks and data networks (ABCS systems, FBCB2 platforms, SINCGARS, EPLRS, NTDR, GBS, and MSE)]. Through these checks the S6 achieves situational awareness of operational user computer systems and isolates problems for quick fix or workaround. A collective overview for establishing the WIN is covered in ST 20-101-5-ABCS, ABCS 6.2.x Draft Battle Staff Tasks.

b. Digital Command and Control Rehearsal (DC2R)

Since the essence of digital C2 is the ability to transmit and receive valid, useable data, a digital C2 rehearsal (DC2R) facilitates verification that ABCS is working as planned. It provides a formal structure to a COMEX / SIMEX that normally takes place prior to a CTC rotation or simulation exercise. It is a phased operation that tests message threads and ABCS collaborative functionality. It also checks to ensure that simulation drivers (if used) are properly passing SA messages to ABCS so that the player unit gets a proper combination of live feed, simulated feed, and wrap around to create the common operational picture (COP). A DC2R enables the unit to achieve its communication objectives.

In particular the DC2R achieves the following objectives:

- The systems and the network are operational.
- Operators have correct EDI / EDC settings.
- Operators know how to perform the individual communication tasks.
- Leaders understand the flow of information.

The DC2R product is a series of spreadsheets and checklists developed by each system TSM during the JCF (2000) train-up to accomplish the above. It aids the systematic review of messaging checks. The example DC2R product is an updateable example based on ABCS 6.2 and is available for viewing and download on the Warrior-T Homepage in the Digital Unit Training Products section at http://fioasat.hood.army.mil

Chapter 2. Digital Battle Command

2-1. Introduction

The principles of command and control do not change with digitization. Commanders still plan, direct, and control the operations of their unit. Digital capabilities however, allow the commander to receive timely, more accurate information, enhancing his ability to visualize the battlefield and make well-timed battlefield decisions. Digital systems allow the same information to be accurately shared across echelons. FM 3-0, Operations, defines this aggregate of shared information as the common operational picture.

> **"A *common operational picture* (COP) is an identical operational picture shared by more than one command…The COP facilitates collaborative interaction and real-time sharing of information between commanders and staffs…..Command and control (C2) fuses information from a variety of sources, while information systems (INFOSYS) facilitate its rapid distribution in usable displays."**

The commander must also remember that the COP represents both known and estimated information and that human input may flaw the COP. People create information in the digital environment, but digital monitoring systems also routinely create it, and computers almost exclusively store it. It is processed by machines into organized and categorized data and then further processed by people when they retrieve it for a specific need. When maintained, the information becomes the newest source of information immediately available throughout the force.

The most radical improvement digital C2 provides over an analog environment is the increased situational awareness (SA) picture displayed with digital graphics. SA overlays provide a near-real time view of the common operational picture (COP) through the use of dynamic data in a joint common database. ATCCS displays the data using a software application called the Common Tactical Picture (CTP). The CTP displays a terrain database (map), friendly (blue) icons, reported enemy unit (red) icons, and geo-referenced messages (bridges, obstacles, NBC contamination, etc.). FBCB2 similarly maintains a common operational picture via dynamic georeferenced messaging among FBCB2 systems and analyzed data update messages from the ATCCS systems.

2-2. The Common Operational Picture Facilitates Understanding

a. Situational Awareness

The term "situational awareness" is frequently used to describe having knowledge or being aware of battlefield activities and situations. It can be most simply defined as a soldier knowing where he is on the terrain, where friendly forces are, and where the enemy is. One of the key benefits of digital C2 systems is having this information displayed on a screen, with the terrain and friendly force array depicted with a high degree of accuracy. Enemy information is portrayed to the fidelity relative to the effectiveness of the intelligence collection operation and associated reporting. It is a depiction of the battlefield—it is "what is," but not what will be or what has to be done. It

is a scientific aspect of control. The commander and staff apply experience and judgment to attain situational understanding from situational awareness. In attaining understanding the commander and staff comprehend the situation, recognize likely actions that will occur, and determine an appropriate response.

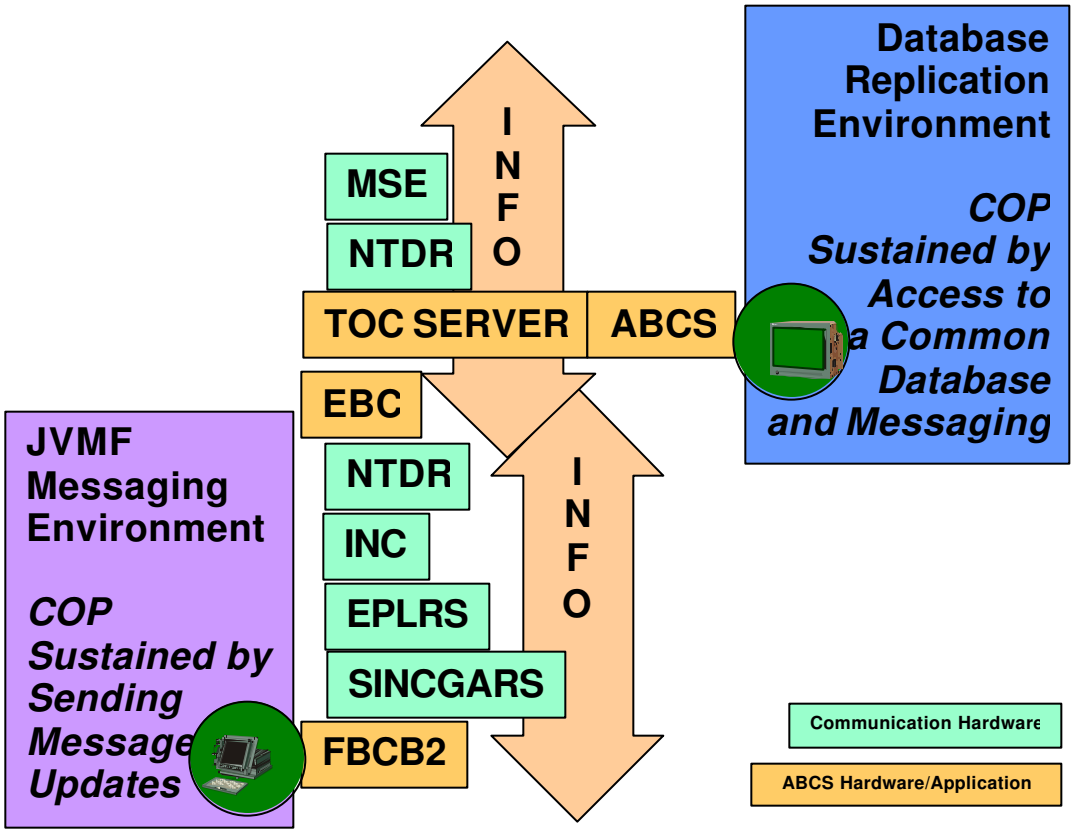
b. Collaboration

Collaboration allows leaders at different locations to simultaneously visualize an identical battlespace using the common operational picture.

2-3. Common Operational Picture Data

a. Situational Awareness Data

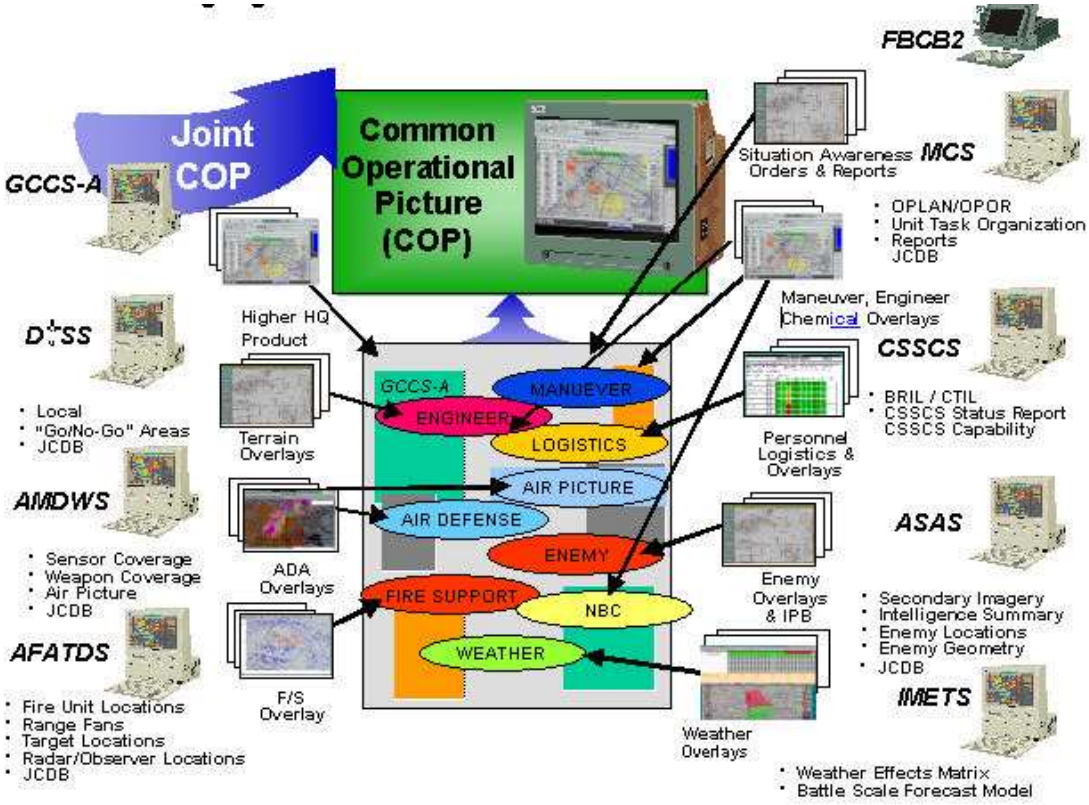
Situational awareness (SA) data consists of dynamic friendly and enemy position reports and battlefield geometry (graphic control measure) information. This data comprises a major portion of COP information. It enables friendly forces to identify enemy and other friendly units to facilitate maneuver and to avoid casualties from friendly fire. SA data is time-critical because only current position locations provide an accurate "picture" of the known tactical situation down to platoon level.



b. Command and Control Information (C2I) Data

Command and control (C2) data includes static orders, personnel and logistical status reports, fire support requests and resource reports, overlays, and general message traffic. C2I data (command and control information such as CCIR) may be as time-critical as SA data and may be just as important for understanding the battlefield environment. C2I data is also a function of the common operational picture; it allows units to collect and review data, and execute operations in a unified and synchronized manner by the commander's intent and critical information requirements. Units must define TACSOP requirements for displaying C2I data to facilitate ABCS information sharing capabilities.

2-4. Mixing Digital Science and BOS Art



2-5. Digital Support to Creating, Maintaining and Leveraging the COP

The difference between an analog COP and a digital COP is that, in a digital environment, all digital CPs draw on a common set of information available within a shared database to create the portion of the COP that shows what respective commanders want to know to fight the battle. An analog COP is limited to the content of the reports received from higher and subordinates and limited by the time required to receive and correlate the information.

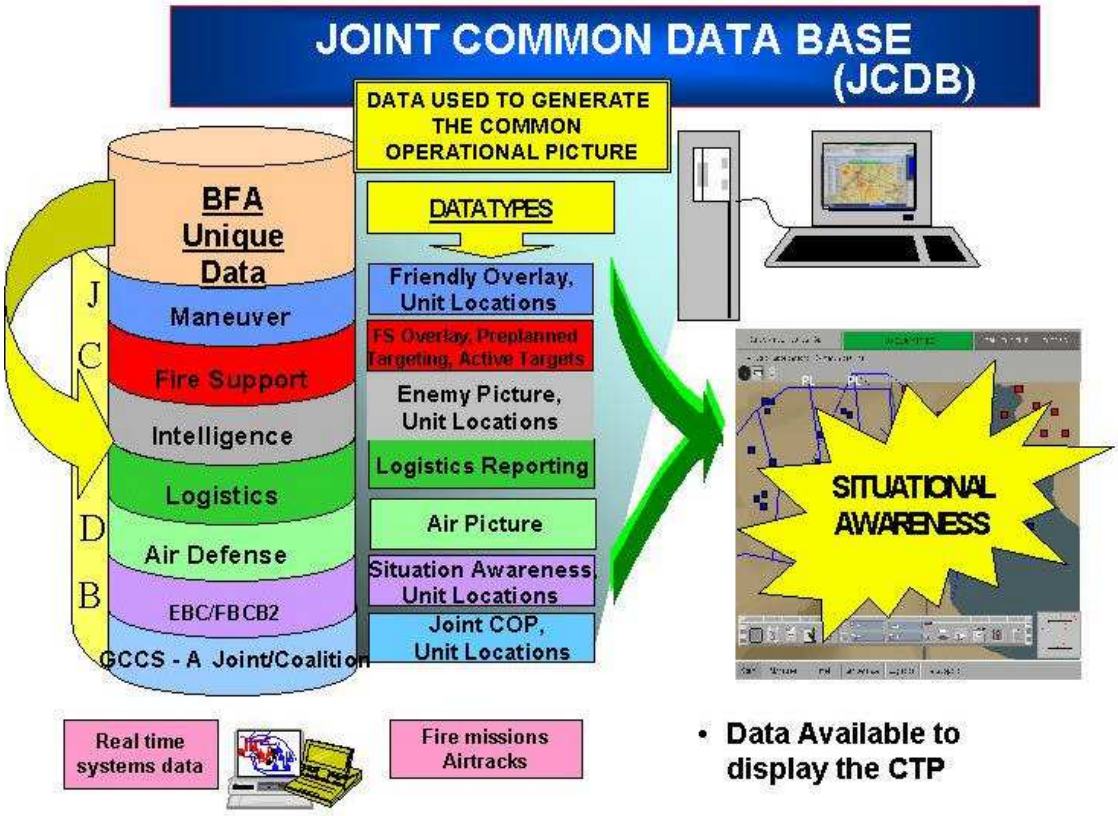
Digital systems allow staffs to spend more time analyzing data than gathering data. Digital information systems (INFOSYS) minimize the time and effort commanders spend assimilating information and developing understanding. They do this by improved

processing of data that adds meaning to data in the creation of the common operational picture (COP).

Digital systems display relevant information (RI) in a usable, easily understood visual form tailored to the needs of the user. Digital systems convey the COP for decision making and exercising C2 functions. Digital displays should be meaningful images, rather than simply masses of data. The battle staff uses standard formats to organize each display and to allow the viewer or reader to know where to look for information. Information is stored, manipulated, and disseminated quickly via digits.

2-6. Joint Common Database (JCDB)

The JCDB is a family of products developed to efficiently store and distribute data shared by two or more ABCS systems. It is a physical database that allows ATCCS to



access identical information to achieve a COP. The JCDB is designed for Intra-TOC and Inter-BOS communications over a cable or wireless LAN. Two major functions of the JCDB are to store and disseminate dynamic (changing) unit information and battlefield geometry.

a. Dynamic Unit Information

- **Blue and Red SA**

In order to understand the CTP, you must understand the way that SA is created and managed. Friendly positions or blue SA are automatic. Each FBCB2 platform derives its location from the Enhanced Position Location Reporting System (EPLRS) or its attached Precision Locating GPS Receiver (PLGR) and disseminates its position over the TI. Blue SA, red SA, and geo-referenced messages generated at the tactical level are received via the Tactical Internet (TI) through the TOC server and displayed by the CTP in the CP. C2 messages also flow through the TOC server and are routed to the appropriate addressees.

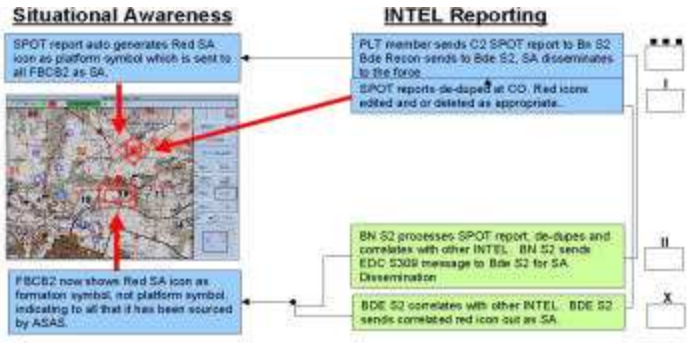
Red SA is a result of soldier input. Spot or contact / engagement reports generate red icons that are disseminated across the TI. ASAS can also provide red SA from numerous sensor sources.

Achieving a COP begins at the platform level as users set up their FBCB2 filters. There are filters that apply to the user's own system (blue) and those that apply to how the user sees other friendly platforms. There are also red filters that depict how red icons will be viewed. Filters allow the user to set the icons, overlays, labels, and geo-referenced graphics that are displayed as part of the overall SA picture. Filter settings are driven by METT-TC. The brigade S3 should dictate SA filter settings to all units under operational control, attached, or assigned, in order to achieve a common battlefield picture. More information on settings and managing blue and red SA is in the FBCB2 section.

Typical Filter Settings		
Platform Type	**Time**	**Motion**
Vehicle	5 minutes	100 meters
Aircraft	15 seconds	100 meters
Dismount	5 minutes	100 meters

- **Red SA Settings**

Digital enemy C2 spot and contact / engagement reports are usually input at the company and below level (FBCB2). It is critical to pass spot reports via FBCB2, because this creates an enemy icon transmitted within the FBCB2 network. The report from FBCB2 should only describe numbers of personnel and equipment. Senders should not annotate whether or not the element is a squad / platoon / company, etc. The sender will address the report to the S2 at battalion, or if a member of the brigade recon troop or Strikers, to the brigade S2. The spot report



automatically creates red SA icons on the FBCB2-area network. FBCB2 red SA is more timely and focused than ASAS disseminated SA. Therefore, it should be displayed exclusively when monitoring the close fight. Operators may be too busy during the close fight to enter the spot report. If so, the observer should notify the company CP or 1SG via FM to input the spot report. It is not efficient to use the task force CP ASAS operator to enter spot reports; it is too time consuming, and the ASAS operator is monitoring the total red picture.

b. Dynamic Battlefield Geometry

Geometry can be input to the JCDB to populate the CTP as a common view from any ATCCS system. However, the JCDB is currently unable to determine the difference between general geometries such as lines, circles, rectangles, etc., and actual geometries used by AFATDS to establish fire support coordination measures (FSCM). FSCM (a coordinated fire line, restricted fire area, etc.) triggers coordination requests in AFATDS during mission processing. General geometries do not cause any special processing; they are simply displayed. This is true even if the MCS operator assigns a name to the geometry that implies it is an FSCM. An FSCM *created and named in MCS* and applied to the JCDB / CTP is still just a general geometry area—it will not trigger a coordination request. If the MCS operator wants to identify a genuine FSCM and have it established in the JCDB to cause coordination, the AFATDS operator must enter it initially or re-enter the data in AFATDS, specifying the appropriate geometry type (NFA, RFA, FSCL, etc.).

Dynamic vs. Static –

Dynamic characterizes graphic information that when saved on one system transfers to the Joint Common Database where it replicates to other JCDBs and systems that have accessed or will access the information. Changes to groups of information may be in part or as a whole, are exact on all systems, and are automatically tracked at the lowest graphic symbol level with date time groups.

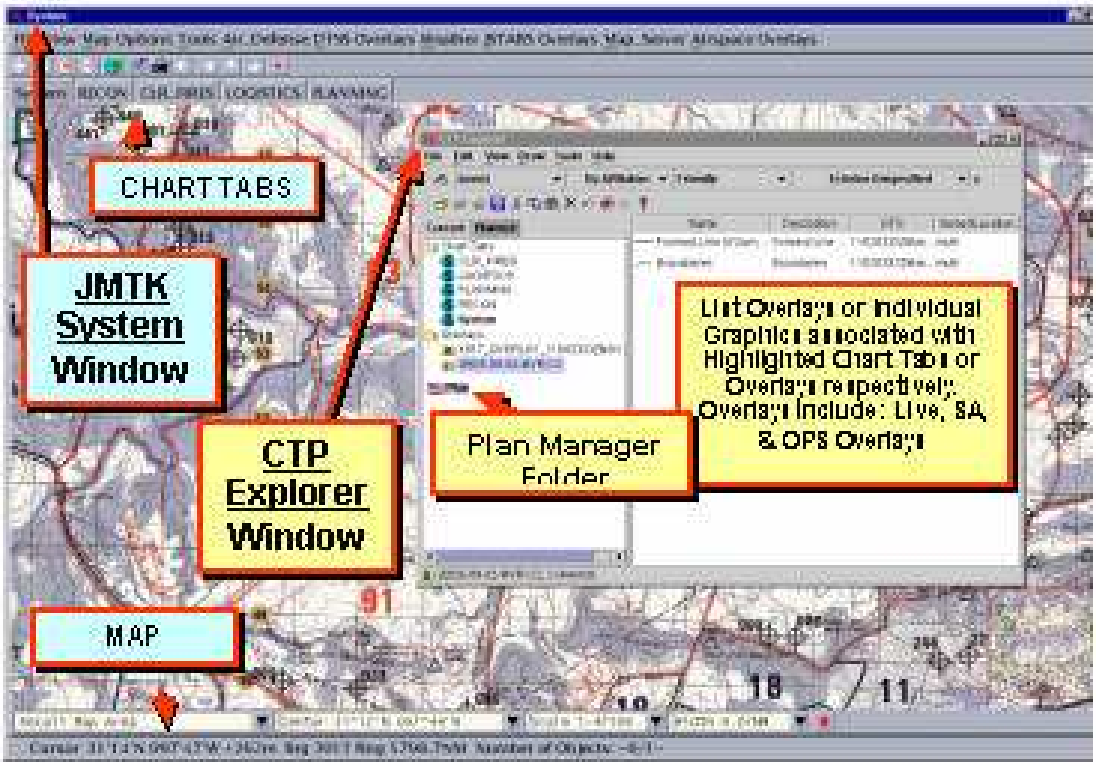
Static characterizes graphic information that when saved remains on the system on which it was saved. When disseminated, a group of static information has no means to remain updated other than by manual update by the receiver, which may cause a lose of common accuracy, or by the sender re-sending the entire updated product for replacement, requiring time and feedback to insure implementation.

2-7. Common Tactical Picture Application

The CTP is a common software application that allows a commander to “visualize” the COP tailored to his preference and echelon. The information displayed is derived from

COP information stored in the JCDB and System Hard Drive Storage. The purpose of the CTP is to display, at each echelon, the information necessary for the commander and his staff to view and obtain a common understanding of the battlefield for purposes of command and control. The COP is typically not just one CTP display but many. Each CTP display retrieves and displays both dynamic and statically stored information. Using Large Screen Displays, the commander is able to see several CTP displays showing much of the COP from various perspectives, usually BOS related. The major portion of data displayed involves the red and blue dynamic SA data and graphic control measures stored in the Joint Common Database (JCDB). The data is depicted on map overlays that can also be displayed throughout the TOC and with other units, higher, lower, and adjacent.

The major components of the CTP are



- **System Window,** the window that displays active situation maps on a map view.
- **CTP Overlay Explorer Window**, the graphic user interface (GUI) window that manages the chart tabs, overlays, map objects, and symbology tools for situation maps.
- **Map Areas,** user set map views that allow the commander and staff to quickly navigate around an active chart tab. Map areas are set to a certain scale, zoom, and map center. When recalled, map areas facilitate tracking the battle and disposition

of forces over a broad area and overcome the limitation of a system monitor of showing only a small area with 1:50-250 resolution.

- **Chart Tabs,** digital map boards that display combined live feed input as well as situational (SA) and operational (OPS) overlays. Various staff sections and units use chart tabs to display battlefield functional area information for planning and execution. Chart Tabs are displayed in the System Window and are listed in the CTP Explorer Window. Although it is possible to display up to five Chart Tabs, operators should limit their number as each Chart Tab requires system resources and slows system operation. An alternative to multiple Chart Tabs is nested overlays by battlefield functional area on one Chart Tab.

- **Static Operational (OPS) Overlays,** overlays that contain static information. They may contain battlefield graphical control measures, but are best used to reflect planned or templated unit locations. This overcomes the inability of the system to use dynamic unit icons for planning purposes in SA overlays. OPS overlays are analogous to digital acetate drops that change only when the system using them updates them. Currently, the common message processor (see below) transmits only OPS overlays. SA overlays must be converted to OPS when sent to FBCB2 via CMP. FBCB2 transmits only OPS overlays. The Plan Manager function of CTP will send both SA and OPS overlays to other ATCCS. A new feature of CTP called the "Gas Gauge" tracks the size of the overlay being created and provides a visual red warning when the size exceeds FBCB2 reception.

- **Dynamic Situational Awareness (SA) Overlays,** overlays that are particularly useful for planning and execution. They are best suited for battlefield graphical control measures. SA overlays display dynamic objects that when saved, replicate to other users based on system data dissemination settings. This means that once another user accesses and posts the overlay all changes made by the originator will update automatically on the user's system. When monitored for size these graphics best suite both FBCB2 and ATCCS environments.

- **Overlay Editors,** allow an operator to filter / query the database for specific map objects that will then populate the CTP Explorer window to produce the map view requested by the commander or staff. Palette, object, and overlay editors are available.

- **Plan Manager,** folder used to group together all things associated with a plan and to disseminate them to other systems. Currently, the plan folder has limited dissemination and OPS / SA overlay storing capabilities. It is the **only means** for disseminating SA overlays. The plan folder will send multiple OPS and SA overlays but not nested overlays. Overlays are automatically posted to the available overlay window and are displayed with the Plan. TACSOP conventions for the use of the plan folder should be established for naming conventions and notification procedures to accurately track the overlays and graphics associated with a sent plan folder. Plans are located only in the Planned Tab of CTP Explorer. The plan folder will allow storage of any number of objects that are associated with a "plan" such as Overlays, Task Organizations, OPLANs, OPORDS, and Sync Matrices. Only overlays within a plan may be accessed within CTP. A folder containing the rest of the non-overlay information is created on the system. It has the same name as the sent plan. The

folder is located in the systems OPLAN directory accessed through the "My Computer" desktop icon.

2-8. Common Operating Environment Message Processor (CMP)

The CMP is a common software application that can be used in different ways, depending on a user's needs. It may be operated as a central processor, serving a number of client systems on a network, or it may function as an integrated system component. It may also be employed as a set of stand-alone tools. It has two main functions: inbound and out-bound message and overlay processing. Additionally, the CMP offers various support functions such as importing messages and overlays from external files into the common environment, integrating message preparation with Lotus Notes, etc. On the inbound side, the software enables the user to process data from inbound messages and overlays and make it available to other users. On the outbound side, users create an address book that allows them to expedite message and overlay processing.

The ATCCS components of the ABCS employ United States Message Text Format (USMTF) messages to exchange information among the battlefield operating systems and supporting systems. This message format is currently undergoing revision to a Joint Variable Message Format (JVMF). See Annex A for USMTF and JVMF messaging information.

2-9. Collaborative Tools

a. NetMeeting

NetMeeting is compatible with the Sun Forum application found in UNIX- based systems. It is accessed through a conference call. The initiator notifies other computers by placing a call through the "Placing a Call" window. Each computer called will receive an invitation to join a conference. The features of NetMeeting are:

- **Whiteboard.** The Whiteboard feature enables diagram information, sketch capabilities, and graphics display for discussion. Participants in a meeting can either have view access or simultaneous draw and type access. Items can be copied and pasted from windows and other areas and applications from the desktop to the Whiteboard. The Whiteboards tools can then be used to further illustrate the pasted objects. Whiteboard pages are synchronized by default. If a participant moves to another page, all other participants will automatically see the new page as well. Whiteboard is an excellent tool to conduct digital rehearsals. This tool is also useful in COA analysis, digital rock drills, and after action review sessions. It may also be employed by a commander to illustrate his intent to subordinate commanders and to receive back briefs.

- **Share Program.** To use the Share Program, one computer needs to have the program so that all the participants can work on documents that are shared. Users can only work in a file that they have "control" of. This means only one person at a time can work in the same document or file. To allow other meeting participants to work on your shared computer, click the "Allow Control" on the Sharing dialog box. Additionally, people can send and receive files to work on.

The Share Program is an excellent tool when time is of the essence. The S3 can write the basic order and execute the Share Program. All other staff sections can simultaneously write or update their annexes. More than one program can be shared at a time. If you share a Windows Explorer window, such as My Computer or a folder on your computer, you are sharing all Explorer windows you have open. Also, once you have shared such a window, every program you start while you are still in the meeting is also shared. Only the person who has the file open and shared is required to have the software program shared on their computer. For example, if the brigade S3 chooses to share a Power Point presentation to subordinate battalion S3s for them to input their comments, only the brigade S3 is required to have Power Point on his computer. **Recommend that users do not select the share in true color check box. True color causes program sharing to run slowly, especially if it is over a dial-up network connection.**

- **Chat Feature**. This is similar to current chat programs available on personal computers. Multiple subscribers can communicate simultaneously. The Chat Feature can be encrypted so that all meetings are private. It is a useful tool in gathering information quickly among echelon BOS sections for an update, such as a slant report or general coordination.

b. Battlefield Planning and Visualization (BPV)

BPV is a self-contained software application that interacts directly with MCS, as long as an intra-TOC LAN, Unix-to-Unix capability is available. It currently will not communicate with any NT-based software system; i.e., MCS-Light. BPV provides COA analysis, wargaming, planning, IPB, and rehearsal support. It can animate planned and predicted unit movements, providing two- and three-dimensional representation of terrain, and friendly and enemy unit locations. It receives unit task organizations from MCS and enemy unit locations from ASAS.

2-10. ATCCS TI Web Capabilities

ATCCS tactical operations center (TOC) configurations use intranet web server capabilities for posting sharable information. With the addition of this web server capability, numerous documents are posted on the TOC LAN server, and messages are sent to users notifying them of their availability. Configuration of this capability allows sharing of information on an as-needed basis. It also minimizes bandwidth utilization, because these reports are available to be "pulled" from the server by users on an as-needed basis, as opposed to being broadcast in their entirety across the network. Information posted on the net is neither dynamic nor linked to the JCDB. Rather it is a snapshot in time or static data. Examples of web documents may include:

- Maneuver
  - OPORD / Annexes
  - SITMAP / COA Graphic Files
  - Operations Report

- Intelligence
  - Intelligence Summary / Reports

  - Battle Damage Assessment
  - Imagery Files
  - Enemy Order of Battle
  - Situation and Event Templates
  - Collection Management
  - Priority Intel Requirements

- Fire Support
  - Artillery Unit Ammo Status
  - Target Management Matrix
  - Fire Plans
  - Target List
  - Attack Guidance
  - High Value and Payoff Target Lists
  - Fire Missions

- Mobility, Countermobility and Survivability
  - Obstacle Overlay / Matrix
  - Terrain Analysis, Terrain Products, MCOO
  - Engineer Estimate / SOEO
  - Engineer Annex

- Air Defense
  - Air Defense Annex
  - Air Defense Engagement Data
  - Air Intelligence Report
  - Aircraft BDA
  - Air Defense Task Organization
  - Air Defense Priorities
  - HIMAD Unit Locations
  - Air Defense Unit Assets

- CSS
  - Logistics Orders
  - Logistics Reports

2-11. Unit Task Organization / Unit Task Reorganization (UTO / UTR)

UTO is simply the task organization that is published in Annex A of the operations order. The S3 informs the commander and staff of UTO changes with a FRAGO. Staff sections must then ensure the current UTO is reflected in their ATCCS. The S3 must ensure that all ATCC systems are using the same UTO. Units should preplan UTO changes so they can be quickly executed when needed. The MCS is the UTO manager at brigade and higher.

At brigade and below, the UTO is managed using FBCB2. The S3 notifies the S6 of UTO changes. The S6 inputs the changes into the FBCB2 at his workstation. The S6 must ensure the UTO changes are made and disseminated throughout the FBCB2 network.

UTO changes must also occur in CSSCS. The changes are input by the brigade S4 using his CSSCS and sent to all CSSCS terminals in the brigade.

After a UTO change, the unit affected must modify default message addresses to reflect the change, and then verify the change by using a free text message sent with a machine acknowledgement.

Chapter 3. Unit Use of Digital Capabilities

3-1. Digital Command and Control

Commanders and staffs will continue to plan, prepare, and execute. The tools they use will change, and some procedures will be altered. Maps will not go away; they will simply be displayed on a computer screen (large and small), where they can be changed quickly using chart tabs and zooming features of the CTP application. Orders and plans will still be produced—the production and delivery methods will change. In addition, preparation will include "hooking up" and initializing not only radios and radars, but also computer systems that are interrelated and depend on each other for data. ABCS *can be* much more timely and efficient; however, its efficiencies depend on proper planning, preparing, and execution (ie TACSOP items).

3.2. Plan

The brigade should include digital preparation as part of their SOP. The following are some standardized procedures the brigade should execute before and maintain during digital operations.

a. Creating and Sending Files to FBCB2

Users must minimize the size of the files created and sent to or from FBCB2 to 576 bytes so they can be sent multicast (see below). This reduces transmission times. Normally, brigade needs the task force (TF) operations overlays. Company overlays should be built on FBCB2 and merged to create consolidated TF overlays. Users will filter out graphics that are duplicated in other overlays to reduce clutter and transmission time. Create maneuver graphics in different colors and size according to echelon. Recommend each task force be depicted in a standardized color (division graphics in black and brigade in blue). This makes the overlay easier to follow. The following recommended method will ensure the overlays stay small and manageable.

- Brigade sends the division and brigade overlay to the TF. The TF
  - Opens the overlay, saves it as the same reference name, and keeps it displayed on their screen.
  - Creates a battalion overlay, adding their operations graphics, but prior to saving it, filters out the graphics from brigade.
  - Saves its battalion overlay with a standardized naming convention and sends both brigade and TF overlays to the company CPs.
- Company CP
  - Opens each overlay and saves it separately.
  - Reopens both overlays and keeps them visible while building a current operations overlay. Before saving the overlay (with a company standardized reference name), the company filters out both TF and brigade graphics so the overlay shows only company graphics. (This reduces duplication and keeps the overlay manageable.)

- Forwards each echelon overlay to the platoon leaders and sergeants.
- Sends its current operations overlay to the TF S3.

- TF S3 receives all company overlays, merges them as one, and sends it to brigade.

- Brigade will have three TF overlays on the original brigade overlay.

b. Naming Files

Save all overlays with the following naming format, UNIT-OPORD-TYPE OVERLAY-DTG. For example, save the engineer obstacle overlay

1BDE-00-22-ENG-OBSTACTUAL-190230AUG00

NOTE. Change the DTG with each update to ensure users post the most current version.

c. Creating the OPORD / OPLAN

The S3 primarily uses MS Word to create the OPORD / OPLAN. Once he creates the basic order, he distributes and correlates it using the shared folder feature to the appropriate staff personnel and receives annexes in return and then distributes the OPORD / OPLAN via CMP or the CTP Send Plan function.

d. Distributing the Order

- The brigade S3 prepares overlays and orders using MCS and disseminates them using CMP.

- Recommend each CP maintain one ATCC system to perform the function of a digital library. That way, if subordinate systems lose files (OPORDS, overlays, etc.), the back up system can easily resend the information.

- Another way to distribute orders (and other information) is by using **Tactical Internet Web Documents.** TOCs use intranet web server capabilities for posting sharable information. With the addition of this web server capability, numerous documents are posted on the TOC LAN server, and messages are sent to users notifying them of their availability. It also minimizes bandwidth use, because reports are available to be "pulled" from the server by users on an as-needed basis, as opposed to being broadcast in their entirety across the network. TOC LAN availability should be a part of SOPs. (See previous section on web documents.)

e. Digital vs. Analog

It will be several years before the entire Army will be digitally equipped. Currently, not all platforms in the brigade are equipped with FBCB2. Operations may require interface with units that do not have digital capabilities. Procedures need to be

established for integration and success on the battlefield for both digital and analog units / operations.

- **Some basic considerations:**

  - FM and MSE will be the primary communications mediums with the analog unit.
  - Hard copy orders and graphics will be required.
  - **Never** use blue SA to clear fires, because not all platforms are digitally equipped.
  - Graphical control measures will require the level of detail necessary to support operations of a unit without SA. In general, this requires more control measures tied to identifiable terrain.
  - LNO teams will be critical.

- **Maps.** The advent of digitization does not mean that acetate and maps have no use and will disappear. Maps remain the best tool at the platform level when maneuvering and fighting on the battlefield, or for controlling / tracking operations over a large area. The combination of a map with digital SA and terrain database are ideal tools; both will be required and extensively used.

- **Digital LNO Team.** Integration with analog units can be significantly enhanced by the use of digital liaison team. The brigade staff structure contains a 9-person liaison section of National Guard soldiers. Its primary functions are:
-
  - Receipt and transmission of orders and graphics via ATCCS.
  - Receipt and transmission of intelligence data via ASAS.
  - Provision of friendly and enemy SA to the analog unit using the ABCS provided by the LNO team.
  - Manual creation of the analog unit blue and red SA and transmission back to the brigade.
  - Fire support coordination and execution.
  - Coordination of actions between the two elements using appropriate communication systems.
  - Extensive use of the Web page to transmit digital data from ABCS to analog units.

- **LNO Team with FBCB2.** In some cases, simply sending a liaison team with FBCB2 can assist in integration. For example, tracking any small analog element in the brigade area can be aided by sending an FBCB2-equipped HMMWV to accompany the element. This would be of great assistance to support elements that may be required to go forward on the battlefield.

- **Analog Skills.** The staff must recognize that integrating an analog unit into the brigade requires retention of most of the analog control techniques. In essence, two control systems have to be in operation, with particular attention paid to keeping the analog unit apprised of all of the pertinent information that is flowing digitally.

3-3. Prepare

The brigade should include digital preparation as part of their procedures for deployment. The following are some recommended standard techniques the brigade should use to facilitate digital operations.

a. Rehearsals

Rehearsing combat actions will continue to be an important part of preparing digital units for operations. Digital units, like their analog counterparts, will execute traditional rehearsals to include combined arms and support (fire support, CSS, etc.) rehearsals. Digital units have new techniques that may be used during rehearsals. They have collaborative tools such as the Whiteboard, the Battlefield Video Teleconference (BVTC), and application software such as the Battle Planning and Visualization (BPV) concept demonstrator. These digital tools provide units with new rehearsal techniques in addition to the analog techniques listed in FM 101-5.

b. Pre-Combat Checks (PCC)

As with analog operations, digital PCC are critical to ensure coordinated mission accomplishment. PCC help eliminate confusion and uncertainty on the battlefield, resulting in timely decisions at all echelons. In order for digital operations to be effective, soldiers and leaders must instinctively know the correct response at the correct time.

Some Pre-Combat Checks that will assist in digital preparedness and operations are:

- Rehearse digital calls for fire and mission threads.
- Calculate digital CFFs that are METT-T driven. Using the Quick Send button is the optimal way to initiate a planned CFF. The button can immediately send the CFF when the enemy hits his trigger point.
- Perform a digital communications check by sending a free text message flow with an operator response (OR) requirement by the receiver. (This is covered in the DC2R.)
- Take two loaded hard drives to the field (all systems).
- ASAS operators should map the A drive (floppy disk drive) before deploying to the field so the A drive is useable.
- The brigade S3 should create and save Terrain Index Reference System (TIRS) data before deploying.
- The brigade commander and S3 are responsible to define the overlays, map data, and SA filters they want displayed in order to have effective coordination. This should be SOP.
- Verify the brigade is knowledgeable and complies with standardized filter settings. Give standardized settings to OPCON units.
- ASAS operators must go into their Enemy Interoperability Destination Screen and turn on EBC in order for EBC to receive the red correlated picture. If this does not occur, FBCB2 will not receive the red correlated picture.
- The brigade CP has dynamic IP addressing. This means IP addresses are assigned consecutively as each system powers up in the CP. If an ATCCS powers down and then back up again, its IP address will change. Since the

IP address is what links a message to a computer, an IP address change can result in messages that do not arrive at the intended ATCCS. The S6 should maintain a list of all IP addresses in the CP.

3-4. Execute

The commander or battle captain must be capable of rapid analysis of the tactical situation and able to make quick decisions. The desired end state is the ability to make decisions more rapidly than the enemy, to control the battlefield tempo in his area of operation, ultimately dominating the enemy.

a. Battle Tracking / Monitoring

One of the advantages of digital capabilities is the amount of information the commander and staff have to support their decision-making process. If staffs do not screen the amount of information provided, the commander will reach "information overload." It is the commander's responsibility to determine specific CCIRs for his staff. This is especially crucial for a new commander / staff relationship. With time and training, the staff can anticipate the commander's requirements.

For more details, see Task 71-6-5220.71-WT07 in ST 20-101-5-ABCS, ABCS 6.2.x Draft Battle Staff Tasks, available on the Warrior-T Homepage (http://fioasat.hood.army.mil).

b. Digital vs. FM

The decision on whether to use FM or digital communications depends on the situation and SOPs. Even though both systems are critical for effective C2 at the brigade and battalion level, FM will remain the primary method for battle tracking at battalion and below level, supplemented by the SA display provided by FBCB2 / EBC and CTP. Some general considerations can help guide the understanding of when to use which mechanism at what time.

- FM will be the primary method of communications when elements are in contact throughout the task force and between task force and brigade. Before and following an engagement, the staff and commanders will use digital systems for disseminating orders and graphics and conducting routine reporting. During operations, the staff will use a combination of communications systems to report and coordinate with higher and adjacent units.

- Staffs at brigade and higher echelons must remain sensitive to the difficulty and danger of using digital systems when moving or in contact and not expect digital reports under those conditions.

c. Other Communications and Battle Tracking Guidelines

- **Managing Red SA**

  The FBCB2 spot report picture can be altered network wide. Once a spot report has been sent digitally, the originator, company level leaders, and battalion level

and higher leaders can modify or delete the location of spot reports. **It is important that subsequent modifications to, or deletions of, spot reports (when the enemy is destroyed or contact is lost) are sent out digitally.** Otherwise, the common red picture will become cluttered and possibly misleading. Ideally, the initial observer is responsible for keeping the report and its associated icon updated until the enemy is either destroyed or "handed off" to another observer. It is important to understand what the ASAS intelligence picture adds to the existing enemy SA (already generated by FBCB2). If not properly managed, it can cause the screen to appear to have duplicates and cause confusion. To avoid this, the FBCB2 user has the option to display the FBCB2 red SA picture, the ASAS picture, or both. Generally, before a mission starts, the ASAS picture should be displayed. This provides a complete enemy picture of the total battlespace. When a mission begins, users should rely on the real-time FBCB2 spot reports, as they are more focused and timely. Unit SOP should be to display the FBCB2 spot reports and dictate pre-defined times (or "on-order") to look at the ASAS feed for the correlated picture.

- **Recommended Enemy Filter Settings**

  As with blue SA, the brigade should standardize red SA filter settings to achieve a common operational picture. The red SA settings should be based on the type of operation the enemy is executing. If the enemy is in the offense (dynamic operation), the stale and purge settings should be shorter. This provides a truer enemy picture and prompts users to frequently update spot reports. If the enemy is in the defense (static operation), settings should be longer.

- **Use of FM Radios**

  - Initial contact at any echelon within the task force should be reported on FM voice; digital enemy spot reports should be entered by a designated platform (CP or 1SG) to generate red SA.
  - Elements moving about the battlefield (not in command posts) will use FM voice unless they can stop and generate a digital message or report.
  - Emergency logistical requests, especially MEDEVACs, should be initiated on FM voice with a follow-up digital report if possible.
  - Combat elements moving or in contact should transmit enemy spot reports on FM voice; their higher headquarters should convert FM reports into digital spot reports to generate SA.
  - Calls for fire on targets of opportunity should be sent via FM voice. Users assigned to a maneuver task force will send their CFF to the battalion FSE that is in their UTO. Users assigned under direct brigade control (for example, BRT and Strikers) will send their CFF to the brigade FSE. DO NOT SEND THE CFF TO BOTH FSEs.
  - Obstacle and NBC 1 reports should be sent initially by voice followed by digital reports to generate a geo-referenced SA message portraying the obstacle or contaminated area across the network.

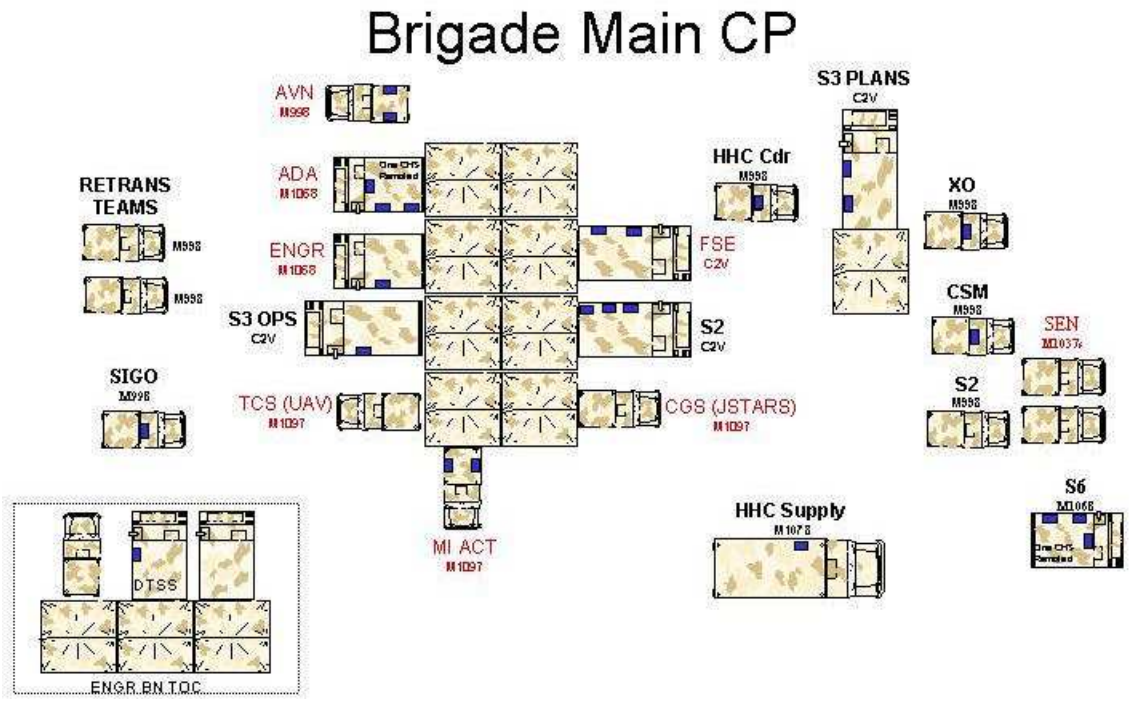
- **Digital Actions**

- Planned calls for fire from FISTS in the initial part of an engagement should be sent digitally.
- Routine logistical reports and requests should be sent digitally.
- Routine reports from subordinates to task force prior to and following combat should be sent digitally.
- Orders, plans and graphics should be sent digitally, **accompanied by an FM voice call to alert recipients that critical information is being sent to them.** Additionally, the transmitting element should request a verbal acknowledgement of both receipt and understanding of the transmitted information by an appropriate soldier (usually not the computer operator).

3-5. Digital Command Post TTP

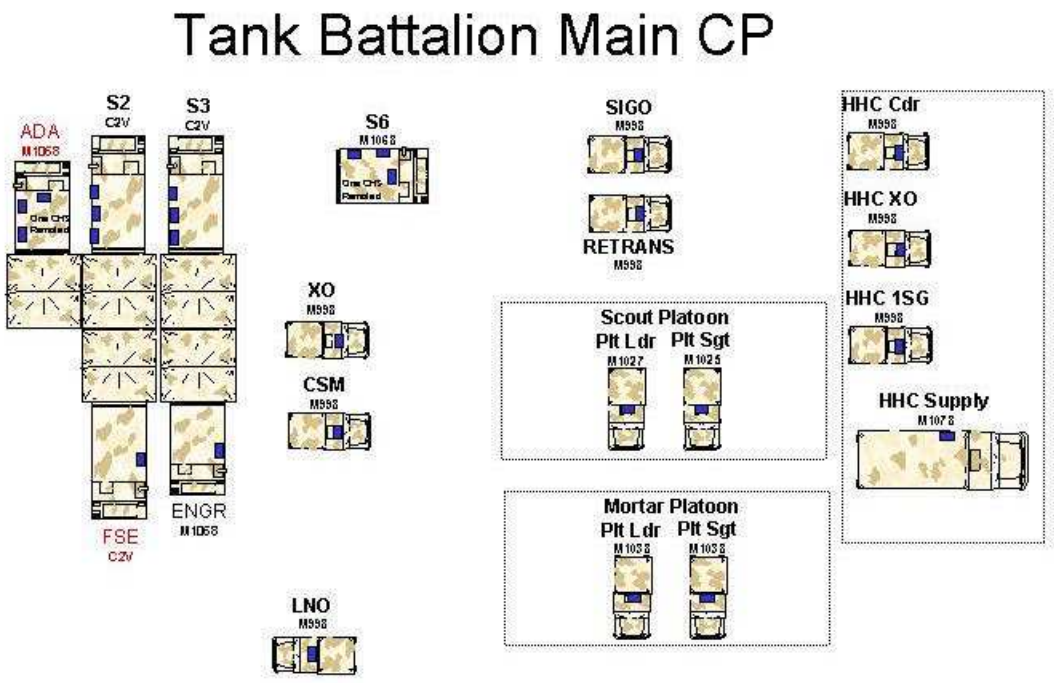
The digital CP processes an overwhelming amount of information. The commander and staff MUST manage this data to prevent information overload and develop appropriate and effective Commander Critical Information Requirements (CCIR). The following illustrations are provided for information only. CP configurations will change based on the commander's needs and his mission requirements.

a. Brigade Main CP



- One or two Large Screen Projection Devices (LSPD) connected to the MCS that runs the CTP (battalion CP runs CTP on MCS workstation).
- The connectivity from the platforms is accomplished via Embedded Battle Command (EBC) and the Joint Common Database (JCDB).
  - EBC is a separate software package that allows ATCCS to share situational awareness (SA) and C2 with FBCB2 equipped platforms.
  - Using this inherent software, EBC feeds the FBCB2 data to the JCDB and the ATCCS through the TOC boot server.

b. Battalion Main CP



- Battalion CPs receives data from the brigade using MCS and ASAS Light. Other than that, the configurations are essentially the same.

- The major differences in establishing a digital command post are that you must
  - Establish the Warfighter Information Network (WIN). NOTE. This is what makes the CP "digital."
  - Establish Information Assurance (IA)
  - Establish the Common Operational Picture (COP)

- Information on establishing a digital CP is available in ST 20-101-5-ABCS, ABCS 6.2.x Draft Battle Staff Tasks.

c. Relocating the Command Post

In its current configuration, the CP is not very maneuverable. The systems are cumbersome and difficult to move. In the event the CP is required to move, an alternate means of command and control must be initiated. Normally, at the brigade level, the TAC takes over this function. As the TAC is not staffed to assume the full responsibilities of the CP, the requirements should be analyzed so as not to over stress the operators.

At the battalion level, recommend that the S3, XO, and FSE (or Engineer) HMMWVs become the ad hoc CP. The C2 element will monitor the battle or current operations by using FM and FBCB2 until the CP can be reestablished. C2 from ATCCS platforms without NTDR capability will not be effective because there is no communications link without the CP LAN. The ad hoc CP should closely monitor FM communications and keep all analog tracking measures in place.

Chapter 4. Overview of Key System Procedures

- The first step in achieving a common picture is standardization of filter settings and file name conventions from FBCB2 and higher. Give standardized settings and conventions to OPCON units.

- Users must minimize the size of the overlays created and sent to or from FBCB2 to 576 bytes so they can be sent multicast.

- All overlays may be saved using the following naming format, UNIT-OPORD-TYPE OVERLAY-DTG.

- All files may be saved using the following naming format, UNIT-Filetype-DTG.

- When sending orders and / or graphics, the transmitting element should request a verbal acknowledgement of both receipt and understanding of the transmitted information by an appropriate soldier (usually not the computer operator).

- Maneuver graphics should be created in different colors and sizes according to echelon. Recommend that division graphics be depicted in black and brigade in blue.

- Recommend each CP maintain one ATCC system to perform the function of a digital library. This way, if subordinate systems lose files (OPORDs, overlays, etc.), the back up system can easily resend the information.

- **Never** use blue SA to clear fires because not all platforms are digitally equipped.

- The brigade S3 should develop UTOs prior to deployment so they can be quickly executed when needed.

- CSSCS and FBCB2 both must initiate a UTO change.

- After a UTO change, units will verify FBCB2 UTO fidelity by conducting C2 digital radio checks.

- Using the Quick Send button is the optimal way to initiate a planned CFF. The button can immediately send the CFF when the enemy hits his trigger point.

- The brigade S3 should create and save TIRS before deploying.

- ASAS operators must go into their Enemy Interoperability Destination Screen and turn on EBC on in order for EBC to receive the red correlated picture. If this does not occur, FBCB2 will not receive the red correlated picture.

- It is the responsibility of the brigade commander assisted by his staff and S3 to define what overlays, map data, and SA filters will be displayed in order to have effective coordination.

- The brigade CP has dynamic IP addressing. The S6 should maintain a list of all IP addresses in the CP.

- It is the commander's responsibility to determine specific CCIRs for his staff so they can screen information and provide only what the commander needs.

- Emergency logistical requests, especially MEDEVACs, should be initiated on FM voice with a follow-up digital report if possible.

- Combat elements in contact should transmit enemy spot reports on FM voice; their higher headquarters should convert FM reports into digital spot reports to generate SA.

- Calls for fire on targets of opportunity should be sent via FM voice. Users assigned to a maneuver task force will send their CFF to the battalion FSE that is in their UTO. Users assigned under direct brigade control (for example, BRT) will send their CFF to the brigade FSE. DO NOT SEND THE CFF TO BOTH FSEs.

- Obstacles sent via FBCB2 Obstacle Report contain an alert function and transmit to all in the Bde Net. Conversion to ATCCS graphics should duplicate and increase obstacle data available. ATTCCS graphics do not contain the alert but provide a wider variety of graphic information. Graphic duplication will require strict management at Bde and below.

Chapter 5. Reference Section

5-1. FMs, Digital Operators Guide, Software User Manuals

- FM 3-0 Operations, 14 June 2001
- FM 6-0 Command and Control (Final Draft)
- Leader Reference Guide v.6.2 Draft
- Staff Leaders Guide v.6.1 TPIO-ABCS 1998
- ABCS 6.1 Digital Operators Guide
- MCS Software User Manual Ver 6.2.11, 9 April 2001

5-2. TTP

- The Common Tactical Picture ABCS v 6.2.x Job Aid, Warrior-T
- ST 20-101-5-ABCS Battle Staff Tasks for ABCS 6.2, Warrior-T
- The Common Operational Picture Primer (Annex B of this Smart Book)

5-3. Web Site Links

- **Warrior–T Homepage**
  http://fioasat.hood.army.mil

- **PEOC3S Knowledge Center**
  http://peoc3s1.monmouth.army.mil/aboutthekc.htm

- **Program Executive Office Command Control and Communications Systems (PEOC3S)**
  http://peoc3s1.monmouth.army.mil/index.htm

- **TRADOC Program Integration Office-ABCS (TPIO-ABCS)** http://leav-www.army.mil/TPIOABCS/

- **Army Training Support Center (ATSC)**
  http://www.atsc.army.mil

- **Digital Force Coordination Cell (DFCC)**
  http://www.dfcc.army.mil

- **Maneuver Combat Training Center / Army Battle Command System Integration**
  http://www.stricom.army.mil/PRODUCTS/ABCS/guide.html

- **Combined Arms Doctrine Directorate Library CADD-CGSC**
  http://www-cgsc.army.mil/cdd/index.htm

- **Army Tactical Command and Control Systems (ATCCS)**
  http://pmatccs.monmouth.army.mil

5-4. PM, TSM Information

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