

MSTP Pamphlet 6-0.2

Guide to USMC Command and Control Systems



MAGTF Staff Training Program
(MSTP)

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Guide to USMC Command and Control Systems

This pamphlet supports the academic curricula of the Marine Air Ground
Task Force Staff Training Program (MSTP).

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UNITED STATES MARINE CORPS
MSTP Center (C 467) MCCDC
3300 Russell Road
Quantico, Virginia 22134-5069

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FOREWORD

1. **PURPOSE.** MSTP Pamphlet 6-0.2, *Guide to USMC Command and Control Systems*, will help the commander and his staff understand the use of Marine Corps command and control systems that support planning and operations.

2. **SCOPE.** This pamphlet covers fielded Marine Corps command and control systems and those commercial off-the-shelf (COTS) applications currently in use by the USMC. It provides an organized and disciplined approach for using these systems and applications to facilitate relevant, timely decisionmaking.

3. **SUPERSESION.** None.

4. **CHANGES.** Recommendations for improvements to this pamphlet are encouraged from commands as well as from individuals. The attached User Suggestion Form can be reproduced and forwarded to:

Commanding General (C 467)
Training and Education Command
3300 Russell Road
Quantico, Virginia 22134-5001

Recommendations may also be submitted electronically to:
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5. **CERTIFICATION.** Reviewed and approved this date.

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Colonel, U.S. Marine Corps
Director
MAGTF Staff Training Program Center
Marine Corps Combat Development Command
Quantico, Virginia

Throughout this pamphlet, masculine nouns and pronouns are used for the sake of simplicity. Except where otherwise noted, these nouns and pronouns apply to either sex.

USER SUGGESTION FORM

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Part I

Introduction

Our world has seen tremendous change in the past two decades, and change and the rate of change continues to accelerate. The next century will see a dynamic, volatile complex world and unprecedented levels of global interaction and connectivity. The Marine Corps can apply this connectivity to our maneuver warfare philosophy to deal with the processes and systems of future operating environments.

To create and maintain a capability for comprehensive command and control of the Marine air-ground task force (MAGTF), we must first know and understand emerging technologies—the systems. We must then embrace and apply them in future evolutions in the exercise of command—the processes.

We designed this pamphlet to help the operating forces come to grips with this challenge. The focus is on clarifying the key technologies that can help commanders and staffs make better warfighting decisions.

1001. Command and Control

As stated in MCDP 6, *Command and Control*—

The words “command” and “control” can be nouns, and used in this way the phrase command and control describes a system—an arrangement of different elements that interact to produce effective and harmonious actions. The basic elements of our command and control system are people, information, and the command and control support structure.

The first element of command and control is **people**—people who gather information, make decisions, take action, communicate, and cooperate with one another in the accomplishment of a common goal. People drive the

command and control system—they make things happen—and the rest of the system exists only to serve them.

The second element of command and control is **information**, which refers to representations of reality which we use to inform—to give form and character to—our decisions and actions. In one way or another, command and control is essentially about information: getting it, judging its value, processing it into useful form, acting on it, sharing it with others. The value of information exists in time since information most often describes fleeting conditions. There are two basic uses for information. The first is to help create situational awareness as the basis for a decision. The second is to direct and coordinate actions in the execution of the decision.

The final element of command and control is the **command and control support structure** which aids the people who create, disseminate, and use information. It includes the organizations, procedures, equipment, facilities, training, education, and doctrine which support command and control. We must recognize that the components of the command and control support structure do not exist for their own sake but solely to help people recognize what needs to be done and take appropriate action. MCDP 6 further states—

The words “command” and “control” are also verbs, and used that way, the phrase command and control describes a process—a collection of related activities. We draw an important distinction between a process, a collection of related activities, and a procedure, a specific sequence of steps for accomplishing a specific task. Command and control is a process. It may include procedures for performing certain tasks, but it is not itself a procedure and should not be approached as one.

Command and control does refer to both the process and the system that the commander uses to decide what must be done, and to ensure that his decisions are carried out. Joint Pub 1-02, *Department of Defense Dictionary of Military and Associated Terms*, defines command and control as:

the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities and procedures employed by a

commander in planning, directing, coordinating and controlling forces and operations in the accomplishment of the mission.

Even with today's complex infrastructure and technology, command is principally a human activity—inseparable from leadership. Thus, the aim of command and control technology is to help leaders—and followers—perform better. An effective command and control system must account for the characteristics and limits of human nature and at the same time exploit and enhance uniquely human skills. This covers the spectrum of the commander framing a strategic concept to a lance corporal making a situation report.

1002. Role of the Commander

The focus of Marine Corps command and control is the commander. It is the commander who drives the process because he alone has the authority, responsibility, and accountability for success of the mission. For the same reason, the commander also shapes how the system is used. Specifically:

- All commanders use information to make decisions and coordinate the employment of people and resources toward mission accomplishment. This is the **process**.
- A commander is linked to his subordinate commanders by a command and control system that collects, processes, disseminates, and protects information. This is the **system**.

As both a process and a system, command and control promotes understanding of enemy capabilities, intentions, and vulnerabilities. It also helps us recognize our own vulnerabilities and ultimately helps us achieve decisive actions.

a. Uncertainty

The defining problem of command and control is the need to deal with uncertainty, that is, unknowns about the enemy, about the surroundings and even about our own forces. We may have some certain knowledge about existing conditions; e.g., location of some enemy units, but we are less certain of what to infer from those facts—such as which course of action he will follow.

b. Time

Time is also a key factor in command and control. For example, we can reduce uncertainty by gaining more knowledge of the situation. However, as we take the time to gain new information, perishable, on hand information is becoming obsolete. Therefore, the rapid tempo of modern operations limits the amount of information that can be gathered, processed, assimilated, and protected in time to be of use.

c. Tempo

MCRP 5-12C defines tempo as *the relative speed and rhythm of military operations over time*. That said, tempo in command and control is the race against uncertainty and time. We set a pace that the enemy cannot maintain—so that with each action his reactions are increasingly late—until eventually he is overcome by events. Then, we can exploit a decisive opportunity by pressing relentlessly and unhesitatingly.

1003. Organizing for Command and Control

Marine forces form into MAGTFs. MAGTFs are task organizations consisting of command, ground, aviation, and combat service support elements. The MAGTF provides a single commander a combined arms force that is tailored to the situation.

The task organization helps to establish the chain of command and the command and support relationships with the force. Command authority for naval forces, as with all U.S. military forces, originates with the President and extends through the Secretary of Defense—with advice of the Chairman of the Joint Chiefs of Staff—to the combatant commanders. A combatant command is a command with a broad, continuing mission under a single commander. A combatant command may have a geographic area of responsibility, referred to as a theater, or functional responsibilities, such as for special operations or space. Combatant commanders typically organize their forces for specific warfighting tasks by forming a joint task force.

There are four basic forms of command relationships—combatant command, operational control, tactical control, and support. Combatant command authority includes broad responsibility for organizing and

employing forces, assigning tasks, designating objectives, and directing all aspects of joint operations, training, and logistics necessary to accomplish the mission. Operational control is the authority to direct all aspects of military operations and joint training to accomplish assigned missions. Tactical control is the detailed and usually local direction and control of movements and maneuvers necessary to accomplish warfighting duties and responsibilities. A commander normally establishes a support relationship by directing one force to support another force.

Having framed the definitions, task organization and command relationships, the remainder of this pamphlet deals with the actual systems that are part of the command and control support structure.

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Part II

Planning and Direction

Marine Corps command and control is part of the defense information infrastructure (DII) (see Figure 2-1). The DII is defined by Office of the Assistant of Defense, Command, Control, Communications, and Intelligence Memo of May 11, 1998 as:

the web of communications networks, computers, software, databases, applications, weapon system interfaces, data, security services and other services that meet the information processing and transport needs of DOD users, across the range of military operations.

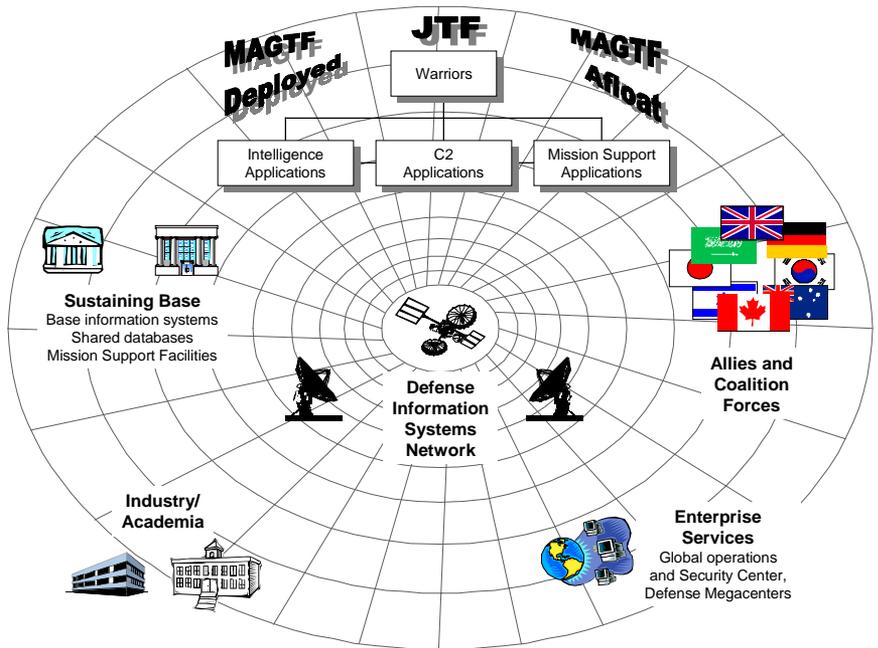


Figure 2-1. Defense information infrastructure.

This infrastructure is not a single program, but rather a capability that results from the integration of individual information management programs across the Department of Defense (DOD) to:

- Revolutionize information exchange DOD-wide.
- Strengthen our ability to apply computing, communications and information management capabilities effectively to the accomplishment of DOD's mission.
- Significantly reduce the information technology burdens on operational and functional staffs.
- Enable those staffs to access, share and exchange information world-wide with minimal knowledge of communication and computing technologies.

In the near future, the DII will provide seamless, secure information products and services to all DOD users, *especially operational commanders*, in support of decisionmaking and mission accomplishment.

2001. Defense Information Infrastructure Common Operating Environment

DII common operating environment (COE) exists to provide a set of integrated support services for mission area application software and a corresponding software development environment. To Marines this means there are common architecture principles, guidelines, and methodologies to ensure that our current and future command and control system will work with the rest of DOD.

THE COE HAS EVOLVED TO PROMOTE INTEROPERABILITY.

2002. Joint Technical Architecture

Joint technical architecture (JTA) provides DOD systems with the basis for seamless interoperability. It defines the service areas, interfaces, and standards applicable to all DOD systems. Adoption of JTA is mandatory for the management, development, and acquisition of new or improved systems throughout all of DOD.

2003. Global Command and Control System

Global Command and Control System (GCCS) establishes and presents a fused, real-time picture of the battlespace to the operational forces for all automated C2 operations. By “fused” we mean a “ground truth” picture of the battlespace. Fused information is reduced to the minimum essentials and then put it into a form that can be acted upon. Joint Pub 6-0 says:

The warrior needs a fused, real-time picture of the battlespace and the ability to order, respond, and coordinate horizontally and vertically to the degree to the degree necessary to prosecute the mission in that battlespace.

GCCS is the single system that supports the warfighter from foxhole to headquarters. It is a flexible, evolutionary, interoperable, joint command, control, communications, computers, and intelligence (C4I) system that supports the DOD C4I for the Warrior migration strategy. This strategy moves preexisting command and control systems into a modern era open system COE.

The baseline GCCS architecture consists of a suite of relational database and application servers. At most GCCS sites, the relational database acts as a typical file server by hosting user accounts, user specific data, and site specific files not part of GCCS. The application servers host the automated message handling system, applications not loaded on the database server and other databases. At each GCCS site, a user interface provides access to applications through user identification and discrete passwords. GCCS software applications fall into these two categories:

a. Common Operating Environment

GCCS COE provides a standard environment, off-the-shelf software, and a set of programming standards that describe in detail how mission applications will operate in the environment. The COE contains common support applications (database management, message handling, correlation, graphics and mapping) and platform services required by mission applications.

b. Mission Applications

GCCS mission applications are summarized in Table 2-1.

Joint Operations Planning and Execution System (JOPES)	See Table 2-2 for summary.
Global Reconnaissance Information System (GRIS)	Supports the planning, requesting, and scheduling of monthly sensitive reconnaissance operations. GRIS is used by the Joint staff and theater commands exercising operational control of airborne reconnaissance assets.
Evacuation System (EVAC)	Collects and displays information about U.S. citizens located outside the USA as collected by U.S. State Department Embassies and consulates.
Fuel Resources Analysis System	Provides fuel planners an automated capability for determining supportability of a deliberate or crisis action plan and for generating the time phased bulk petroleum, oil, and lubricants required to support an operation plan (OPLAN).
Global Status of Resources and Training (GSORTS)	Provides information on status of units with respect personnel, equipment, and training. Query and display capabilities include categories of units, specific types of units, and specific units.
Joint Maritime Command Information System (JMCIS)	This is the foundation for the GCCS fused operational battlespace picture. JMCIS uses a core service, (known as unified build) to provide geographic display, contact correlation, and track database management.
Theater Analysis and Replanning Graphic Executions Toolkit	Contains a planning tools designed to allow planners and operators to accomplish tasks through rapid access to required documents, information sources, analysis tools, multi-media and teleconferencing.
Joint Deployable Intelligence Support System (JDISS)	Provides the intelligence window to access national, theater, and tactical intelligence sources through the joint architecture for intelligence. It provides connectivity and interoperability with intelligence systems required to support forces during peacetime, crisis, and war. JDISS includes INTELINK at the secret classification level. INTELINK provides intelligence dissemination using networked information discovery, retrieval, and browsing services.
Air Tasking Order (ATO)	Provides the capability to view and print selected portions of ATOs. A query function allows the user to tailor requests for information contained in a specified order for viewing. ATO interfaces with contingency theater automated planning system (CTAPS).

Table 2-1. GCCS mission applications.

Within these GCCS mission applications are the mission specific applications of JOPES. Table 2 summarizes these.

Requirements Development and Analysis	Creates, analyzes and edits time-phased force and deployment data.
Scheduling and Movement	Handles command and control information on deployment activity and status. Functions as a vehicle for the scheduling and tracking movement of time-phased force and deployment data requirements.
Logistics Sustainment Analysis and Feasibility Estimator	Assists logistics planners in determining sustained movement requirements during deliberate and crisis action planning.
Joint Flow and Analysis System for Transportation	Provides users the ability to determine transportation feasibility of an OPLAN of course of action (COA).
Joint Engineer Planning and Execution System	Provides users a method to determine requirements and/or adequacy of engineering support provided in OPLANs or COAs.
Medical Planning and Execution System	Provides contingency medical support information for allocating medical resources.
Non Unit Personnel Generator	Assists in determining quantities of replacement and augmented personnel.
Ad Hoc Query	Provides a means to develop, save, and print tailored queries extracting data from the JOPES core database
Systems Support	Functions as the JOPES core data base.
Airfields	An information retrieval application providing the capability to access, extract and print information from the Automated Air Facilities Information File database.

Table 2-2. JOPES mission specific applications.

As illustrated in Figure 2-2, GCCS has a single COE networked to support sharing, displaying and passing of information and databases that supports the MAGTF.

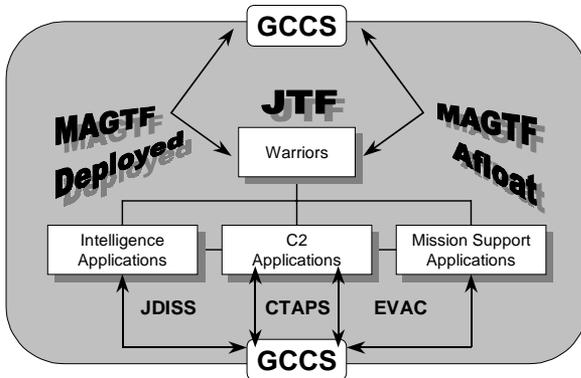


Figure 2-2. GCCS support to the MAGTF.

For example, the joint task force or the MAGTF can use GCCS to access intelligence information—through the JDISS. They can revise or confirm portions of the air support plan—through the CTAPS—and collect and display information about U.S. citizens located outside the U.S.—through the EVAC. The GCCS infrastructure consists of a client server environment incorporating UNIX-based servers and client terminals as well as personal computer X-terminal workstations operating on a standardized local area network (LAN).

2004. SECRET Internet Protocol Router Network

GCCS provides data transfer facilities between workstations and servers. Connectivity between GCCS sites is provided by the SECRET Internet Protocol Router Network (SIPRNET). Remote user access is also supported via dial-in communications servers, or via telnet from remote SIPRNET nodes.

Part III

MAGTF C4I

There are indeed great changes that are occurring with civilian and military technologies. But our view in the Marine Corps is that these changes will only allow us to improve our capabilities, they will not alter the fundamental nature of war.

LtGen P.K. Van Riper USMC (Ret)

MAGTF C4I is the overall concept for the migration and integration of tactical data systems, communication systems, and information security systems in the Marine Corps. The goal of MAGTF C4I is to provide commanders with a common tactical picture (CTP) and means to manage the increasingly complex modern battlespace. MAGTF C4I provides the ability to send, receive, process, filter, store, and display data to aid in tactical decisionmaking. MAGTF C4I employs the same type of common hardware and software whether ashore or afloat, or while in garrison or in the field.

3001. Marine Common Hardware Suite

The concept of the Marine common hardware suite (MCHS) is to centralize procurement and management of hardware. The MCHS was established to provide common hardware items to program managers, functional managers, operational commanders, and the supporting establishment. It includes three basic technology ranges for varying capability from high, medium, and low-end platforms. In addition to providing support for tactical and non-tactical C4I programs, it ensures that each program fits within the framework architecture. All components of the MCHS have been validated by the MAGTF C4I Configuration Control Board to ensure that interoperability with current Marine Corps software standards.

3002. MAGTF C4I Software Baseline

By capitalizing on the existing core services of the DII COE, the Marine Corps is re-engineering numerous systems across the warfighting functions of maneuver, intelligence, fires, logistics, command and control, and force protection. Successive versions of the MAGTF C4I Software Baseline (MSBL) will provide increased functionality as the threat, doctrine, and requirements evolve. The MSBL includes the systems describe in Table 3-1.

<p>Advanced Field Artillery Tactical Data System</p>	<p>Automated fire support command and control system that rapidly integrates all supporting arms into maneuver plans via a digital data link. Supports timely exchange of fire support/target processing to include artillery, rockets, mortars, naval surface fire support, and close air support. Used at: fire direction center, fire support coordination center, force fires coordination center, direct air support center, supporting arms coordination center, tactical air command center and rear area operation center. Software architecture is interoperable with USMC communications, MSBL and the GCCS COE.</p>
<p>Intelligence Analysis System (IAS)</p>	<p>IAS is a shelterized, mobile system with multiple analyst workstations in a client-server LAN configuration. IAS suites for major subordinate commands are configured in either a two or four-workstation LAN. Single IAS workstations are for battalion and squadron sized units. Both IAS and IAS suites operate at secret and top secret/special compartmented information levels. IAS workstations operate at secret level. IAS also hosts the Secondary Imagery Dissemination System and has provisions for communications links with other intelligence agencies and systems at the national, theater, and tactical levels.</p>
<p>MAGTF Secondary Imagery Dissemination System</p>	<p>Capable of electronically collecting, manipulating, transmitting, and receiving imagery products throughout the MAGTF as well as to adjacent, higher and external commands. Hosted on IAS suites and in a stand-alone MANPACK configuration. Both allow the user to display, manipulate, annotate, print, transmit, and receive images. It complies with the National Imagery Transmission Format and the Tactical Communications Protocol.</p>
<p>Tactical Combat Operations (TCO)</p>	<p>Automates the MAGTF's ability to receive, fuse, select and display information from many sources, and disseminate selected information throughout the battlespace. TCO system attributes include:</p> <ul style="list-style-type: none"> • Automated message processing. • Mission planning development and dissemination of operations orders and overlays. • Display of current friendly/enemy situations. • Display of tactical control measures. • Interfaces with local and wide area networks. <p>Currently TCO is compatible with JMCIS allowing the MAGTF to share battlespace information with the Navy and Coast Guard. TCO is not currently compatible with GCCS but will be in the next version of GCCS (V 3.1).</p>

Command and Control Personal Computer (C2PC)	Provides the commander with the ability to display and to disseminate the common tactical picture to levels below the battalion. C2PC runs in the PC environment (desktop and laptop) in the Windows 95 or Windows NT™ operating system.
Contingency Theater Automated Planning System	Creates and disseminates the ATO. It runs at the secret level on UNIX-based servers on the tactical air command LAN. Has been mandated for joint ATO dissemination. System is scalable and provides capability for smaller, quick response situations. The system allows operations to be conducted in a range of environments from Marine Corps only, to joint and coalition environments.
MAGTF Logistics Automated Information System	A family of coordinated, mutually supporting, automated systems to support deliberate and time-sensitive/crisis action planning for MAGTF deployment, employment, and redeployment. It has PC based elements.
MAGTF Tactical Warfare Simulation	Supports training of USMC commanders and staffs. Provides full spectrum of combat models to support USMC major functional areas of ground combat, air operations, fire support, ship-to-shore movement, combat service support, combat engineering and intelligence. The system provides limited play in electronic warfare, communications, and nuclear, biological and chemical warfare. Currently being interfaced with USMC C4I systems.

Table 3-1. Descriptions of current C4I systems.

This is not an all-inclusive list. Systems will be added and deleted as technology improvements are implemented.

3003. Communications and Communications Support

There are several communications and communications support projects in procurement that will be significant to the overall command and control effort. The Digital Automated Communications Terminal (DACT) and the Enhanced Position Location Reporting System (EPLRS) are two that are key.

a. Digital Automated Communications Terminal

The DACT is a tactical input/output battlespace situational awareness system and communications terminal. It provides digital connectivity to echelons below the battalion. The DACT integrates information from command and control functional areas and allows users to receive, store, retrieve, create, modify, transmit, and display map overlays, operational messages/reports, and position information. It utilizes the ruggedized

handheld computer running C2PC software. Company and platoon commanders will now have technology at their side. DACT will be fielded during FY 99.

b. Enhanced Position Location Reporting System

EPLRS provides critical command, control, and situational awareness. It is a tactical data distribution network that currently does not exist. It can also serve as source for automated friendly Position Location Information and navigation information for MAGTF C4I users, in conjunction with global positioning system-based systems. When used with other MAGTF C4I communications and networks, it provides a seamless connectivity for forward-deployed tactical commanders. EPLRS will become operational during FY 00.

Part IV

Commercial-Off-The-Shelf Applications

The global information infrastructure electronically links organizations and individuals around the world and is characterized by a merging of civilian and military information networks and technologies.

A Concept for Information Operations, USMC Concept,, August 98

Disclaimer. The United States Marine Corps, while recognizing certain commercial products in this pamphlet, does not endorse any of the products listed here. Technology and the marketplace drive the products that are available. The USMC will use the best technology or tool for the job at any given time.

There are a number of commercial software applications and tools that are currently being used by the Battle Staff Training Facility (BSTF) in execution of their mission of developing tactics, techniques, and procedures to integrate current C4I and COTS technologies. They are also used throughout the operating forces.

4001. Exchange Server

Exchange Server has a messaging foundation that is scalable, reliable, and secure. It allows you to choose protocols and clients that are best for your environment. It allows you to build collaborative applications that take advantage of existing knowledge and skills. It is easy to manage and administer. Tight integration with the operating system sharing security and management tools avoids any duplication of effort.

4002. Office Professional Edition

Office Professional Edition is a suite software package providing important tools. These applications are integrated so that all the toolbars are alike, the command and function keys are identical, and tasks can be performed from one program to another. It brings the Internet to your desktop, with tools for finding information, publishing documents and working with others.

- **Word** simplifies common word-processing tasks with built-in tools. These tools make it fast and easy to create documents. Text, data, and graphics can be integrated into documents. It quickly produces results so more is accomplished with less time and effort.
- **PowerPoint** has tools to help allow you to easily organize, illustrate and deliver your ideas as an informal briefing, audience slide show or delivering an internet message.
- **Excel** is a spreadsheet. Basic operations, formula creation, printing, formatting and charting have all been simplified.
- **Access** provides a relational database to give the information needed to make better decisions. It integrates data from spreadsheets and other databases, and is the way to find answers, share information over intranets and the Internet, and build faster solutions. It allows you to generate, analyze, and create reports.

4003. Outlook

Outlook is a messaging and collaboration client. It helps users communicate with others through e-mail, telephone, group scheduling, and real-time conferencing software. It helps users share information through Internet connectivity, Exchange Server public folders, and electronic forms. It integrates and organizes this communication and shared information in one application. Outlook works seamlessly with Office, Exchange Server, and Internet Explorer.

4004. Project

Project allows for the creation of projects of any size, tracking progress, and communicating important project information quickly and easily.

4005. Internet Explorer

Internet Explorer allows the user to find information on the Internet. It has hyper text mark-up Language that gives developers the ability to create interactive web pages that load and react with the click of a mouse. It also provides the ability to run Java based applications.

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Part V

Making It All Work Together

Nothing succeeds in war except in consequence of a well prepared plan.

Napoleon Bonaparte

Command and control is made up of people, information, and the command and control support structure. The command and control support structure includes organizations, procedures, equipment, facilities, training, education, and doctrine. These things must all work together. For them to work together we must plan for them. Then we must train to the plan.

The Commanding General, Marine Corps Combat Development Command recognizing that training, education, and doctrine play an important role in command and control, initiated a project designed to develop a "world class" training facility. The goal of the facility is to fully integrate the latest C4I technology and COTS. The BSTF would also support both the operating forces and Marine Corps University. The facility is a subordinate organization of MSTP.

The MSTP BSTF is charged with developing the tactics, techniques, and procedures required to integrate current C4I and COTS technologies to support MAGTF warfighting C2 requirements. The BSTF will ensure the capabilities of systems conform to joint standards, are capable of achieving a CTP, and will aid in acquiring improved situation awareness to allow commanders to make sound, timely decisions working in a common operational picture (COP) environment. Thus, the BSTF can help us understand how to make it all work together.

The BSTF uses mobile training teams (MTT) to teach what they are developing. This instruction includes practical applications which provide students actual keyboard and system time. These MTTs are part of the MSTP training cycle (MTT, Phase I-IV) for the Marine expeditionary forces.

5001. Common Operational Picture/Common Tactical Picture

The COP is the integrated capability to receive, correlate, and display a CTP, including planning applications and theater-generated overlays/projections (i.e., meteorological and oceanographic (METOC), battle plans, force position projections). Overlays and projections may include location of friendly, hostile, and neutral units, assets, and reference points. The COP may include information relevant to the tactical and strategic level of command. This includes, but is not limited to, any geographically oriented data, planning data from JOPES, readiness data from GSORTS, intelligence (including imagery overlays), reconnaissance data from GRIS, weather from METOC, predictions of nuclear, biological and chemical fallout, and ATO data. The COP serves as a management tool for the commander and his staff. The COP and CTP are not specific depictions of the operational or tactical situations but rather, users apply filters to the COP and CTP to build views of the situation specific to their needs.

CTP is a subset of COP and refers to the current depiction of the battlespace for a single operation within a combatant commander's area of responsibility. The CTP includes current, anticipated or projected, and planned disposition of hostile, neutral, and friendly forces as they pertain to U.S. and multinational operations ranging from peacetime through crisis and war. The CTP includes force location, real time and non-real time sensor information, and other amplifying information such as METOC, GSORTS, and JOPES. The CTP serves as a command and control tool for the following commanders and their staffs:

- Joint task force.
- Marine Corps component.
- MAGTF.

Figure 5-1 depicts the flow of the COP/CTP with two independent joint task forces.

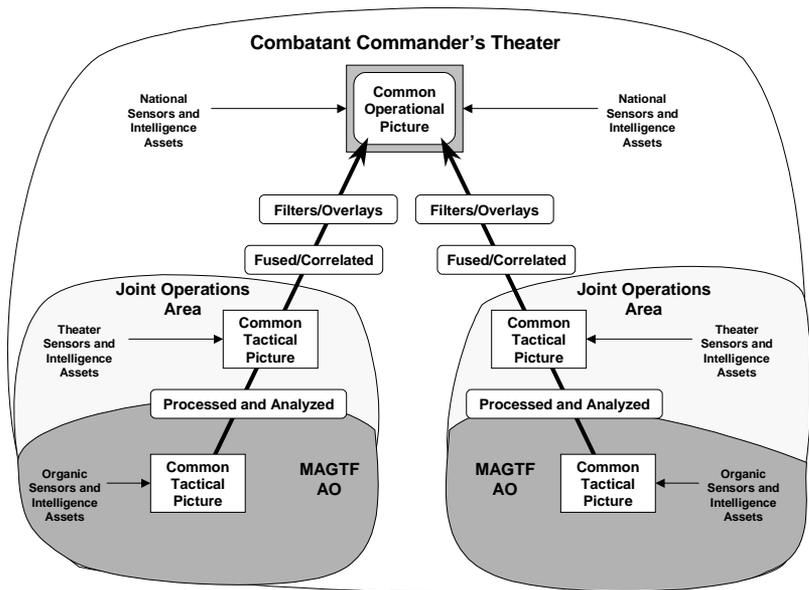


Figure 5-1. Common operational picture/common tactical picture flow.

5002. Collaborative Planning

A collaborative planning system is a compilation of systems, applications, and tools designed to support the planning, decision, execution, and assessment (PDE&A) cycle. The processes and procedures outlined in this pamphlet are only techniques to use current USMC C4I and commercial applications to assist commanders and staffs support the Marine Corps Planning Process (MCP). The six steps of the MCP are:

- Mission analysis.
- COA development.
- COA war game.
- COA comparison and decision.
- Orders development.
- Transition.

Through the use of Microsoft Exchange, Office 97 Professional Edition, and C2PC software, a collaborative planning system can be developed that

allows for the displaying of text, imagery, and graphic information. This pamphlet will concentrate on the actions and activities normally associated with an operational planning team (OPT) developing COAs, specifically at the MEF level. It is important to note that these methodologies, processes, and procedures can be applied at any level of command. Of further importance is the fact that maps embedded in C2PC allow personnel to develop scalable and exportable maps and overlays that retain location regardless of map scale selected. This feature allows products to be sent with the exact location (grid or latitude/longitude) simultaneously to multiple users with a push of a button. All of the procedures listed here are suggestive rather than prescriptive in nature (i.e., there are many ways the mission can be accomplished, this is just one way to do it).

a. Mission Analysis

Joint Pub 1-02 defines the mission as:

the task, together with the purpose, which clearly indicates the action to be taken and the reason therefor.

It is essential that we get our mission clearly identified and understood. During mission analysis, we review and analyze orders, guidance, and other information provided by higher headquarters and produce a mission statement. Mission analysis drives the MCPP. The commander could accomplish this by using Microsoft Excel to complete the commander's battlespace area evaluation form and posting it in a Microsoft Exchange Public Folder titled "Commander's Notes". Then using C2PC to display an electronic map, the commander provides an orientation to his staff on the battlespace, his intent, and planning guidance. This includes task analysis, resource, and subject matter expert shortfalls as well as commander's critical information requirements. A number of Microsoft Excel worksheets are used to conduct task analysis, center of gravity analysis, and resource and subject matter expert shortfall analysis. All these worksheets are posted in the OPT Public Folder "Mission Analysis" and become part of the mission analysis brief to the commander.

b. Course of Action Development

A COA is a broadly stated potential solution to an assigned mission. It begins as a concept or idea that meets the criteria of:

- Acceptability.
- Feasibility.
- Distinguishability.
- Suitability.
- Completeness.

The COA development step of the MCPP is designed to generate a range of options for follow-on analysis and comparison that satisfy the mission, intent, and guidance of the commander.

During COA development, we use the mission statement, commander's intent, and commander's planning guidance to develop COAs. Then we examine each prospective COA to ensure that it meets the above criteria relative to the current and anticipated situation, mission, and commander's intent. We get started by using C2PC to display the graphic representation of the battlespace as it would be expected for the time frame of the planning horizon being considered by the OPT. Text information is displayed using Microsoft Exchange.

Intelligence preparation of the battlespace (IPB) continues, and enables the OPT to view the battlespace in terms of the threat and the environment. The OPT identifies the required IPB products to the MAGTF all-source fusion center (MAFC) via the Microsoft Exchange Task Manager. The projected situation template is developed by the MAFC using the C2PC overlay function. Microsoft Excel worksheets are used to assess relative combat power, refine and validate centers of gravity to include critical vulnerabilities, and prioritize essential tasks. Worksheets prepared in the previous step are used, updated, and republished to the Public Folders and the web.

After analyzing and synthesizing the above information C2PC is used to display all required information. Using the overlay function of C2PC, the OPT can develop a combination of graphic and text information to depict initial COAs. These initial COAs are further developed using the commander's guidance, expanded and refined as necessary and then saved graphically using C2PC. COA development outputs are the commander's designated COAs for analysis, commander's wargaming guidance, and evaluation guidance. As each COA is analyzed, two matrices are prepared using Microsoft Excel; critical events matrix and synchronization matrix. They are used extensively in COA analysis.

c. Course of Action War Game

The war game compares friendly COAs against selected threat COAs. This step of the MCPP assists us in identifying strengths and weaknesses, associated risks and asset shortfalls for each friendly COA through analytical wargaming. Using C2PC and Microsoft Office applications, the graphic and text information for each COA developed is displayed by placing the graphic (mapping) information on one large screen display and the text information on another large screen display. This allows the OPT members to view the information and annotate required changes during COA analysis. The critical events matrix and the synchronization matrix are simultaneously displayed on another large screen or printed and distributed to all OPT members. All changes to the COAs are recorded and reflected on the C2PC Overlays and with the Microsoft applications.

d. Course of Action Comparison and Decision

During this step the commander evaluates all friendly COAs, against established criteria, then compares each COA against each other and selects the COA that he deems best to accomplish the mission. Maps, battlespace overlay products, and graphic depictions of each COA are used during the comparison and decision process. We also use the updated event template, decision support matrix, and synchronization matrix. Using Microsoft Excel with the COA comparison/decision matrix and associated graphic products, the OPT presents the COAs to the commander and staff. The commander determines how thoughts and ideas will be captured on the matrix as they occur. Once the commander makes a decision, the OPT publishes the COA and all related worksheets and matrices on the web and in their public folder.

e. Orders Development

The OPT begins compiling all the information and products into a cohesive plan for dissemination to the major subordinate commands and higher headquarters. The OPT copies and pastes information into the order or use a local Microsoft Word template for the operation order or fragmentary order. Once the OPT completes the basic order, they post it in the Orders Folder in the OPT Public Folders section on the Exchange Server. The signature page of the order includes a listing of all Annexes included with the basic plan. As each staff section posts their requisite annex, the OPT recorder is responsible for hyper linking references to annexes in the basic order to the

actual documents. The Orders Development Folder is password protected until the order is reviewed and approved. Once approved the OPT disseminates the order via the web or Microsoft Exchange Public Folders. The OPT archives all files to tape backup for future use. The files are also stored on the Exchange Server.

f. Transition

A successful transition enhances the situational awareness of those who will execute the plan, maintains the integrity of the concept of operations, promotes unity of effort, and generates tempo. C2PC overlays are sent to current operations via e-mail or the Microsoft NetMeeting file transfer function. The transition brief can be done electronically using the presentation conference function in Microsoft PowerPoint. A “transition drill” is part of the transition brief. It is a guided discussion of the envisioned flow of events, with a demonstration of available decision support tools. It also outlines the assessment concept for tasks to be measured.

5003. Execution

While the above paragraphs lay out an approach for using C2PC and COTS applications to support the MCPP, execution of the plan is carried out and monitored by USMC C4I systems. C2PC provides the avenue to get the planning products into the command and control systems. C2PC is part of the MSBL and can exchange data with other MSBL systems (e.g., TCO). TCO can exchange data with other Unified Build based systems including JMCIS and GCCS. This allows the CTP generated and displayed by C2PC to be sent to and displayed by GCCS terminals giving commanders a near real-time picture of events in the battlespace. It also gives superior commanders insight into the planning used by tactical commanders to accomplish the mission.

DII COE and the JTA are two efforts that work in harmony to bring order to C4I systems. Proprietary systems, differing message protocols, non-homogeneous data bases, and differing communications protocols are a few of the technical difficulties that restrict data exchange. In the future, GCCS will be the only C4I system that will be required to support planning, operations, and assessment.

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Part VI

Summary

Confronted with a task, and having less information available than is needed to perform that task, an organization may react in either of two ways. One is to increase its information- processing capacity, the other to design the organization, and indeed the task itself, in such a way as to enable it to operate on the basis of less information. These approaches are exhaustive; no others are conceivable. A failure to adopt one or the other will automatically result in a drop in the level of performance.

Martin van Creveld, *Command in War*

Command and control is the process and the system that the commander uses to decide what must be done—and sees that his decisions are carried out. The focus of USMC command and control is the commander.

The defining problem of command and control that overwhelms all others is the need to deal with uncertainty. Another element that affects command and control, second only to uncertainty in order of importance, is the factor of time. As MCRP 5-12C states the definition of tempo as *the relative speed and rhythm of military operations over time*, then it can be said that tempo in command and control is the race against uncertainty and time. Relating this to our philosophy of maneuver warfare, the winner of that race establishes superior tempo. That is, we set a pace that the enemy cannot maintain—so that with each action his reactions are increasingly late—until eventually he is overcome by events.

Today's command and control systems allow commanders to achieve a superior tempo. Information management tactics, techniques, and procedures also allow commanders to maintain that tempo.

DII COE and the JTA are two efforts that work in harmony to bring order to C4I systems. Proprietary systems, differing message protocols, non-homogeneous data bases, and differing communications protocols are a few

of the technical difficulties that restrict data exchange. In the very near future, GCCS will be the only C4I system that will be required to support planning, operations, and assessment.

GCCS is a flexible, evolutionary, interoperable, joint C4I system which supports the DOD C4I for the Warrior migration strategy. GCCS is composed of several mission applications built to a single COE networked to support sharing, displaying and passing of information and databases. GCCS gives the commander a highly flexible system capable of collecting, processing, disseminating and protecting information to support critical decisionmaking and to achieve unity of effort and command dominance.

MAGTF C4I is the overall concept for the migration and integration of tactical data systems, communication systems, and information security systems in the Marine Corps. The goal of MAGTF C4I is to provide commanders with a common tactical picture and means to manage the increasingly complex modern battlespace. MAGTF C4I provides the ability to send, receive, process, filter, store, and display data to aid in tactical decisionmaking. MAGTF C4I employs the same type of common hardware and software whether ashore or afloat or while in garrison or in the field.

There are a number of commercial software applications and tools that are currently being used by the BSTF. Microsoft Exchange Server, Office 97 Professional Edition, and Internet Explorer are also used throughout the operating forces.

A collaborative planning system is a compilation of systems, applications, and tools designed to support the PDE&A cycle. The processes and procedures outlined in this pamphlet are only suggested techniques to use current USMC command and control systems and commercial applications to assist commanders and staffs support the MCPP. Through the use of Microsoft Exchange, Office 97 Professional Edition, and C2PC software a collaborative planning system can be developed that allows text, imagery, and graphic information to be shared in a collaborative environment.

Appendix A

Glossary

Note: Acronyms change over time in response to new operational concepts, capabilities, doctrinal changes and other similar developments. The following publications are the sole authoritative sources for official military acronyms:

1. Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*.
 2. MCRP 5-12C, *Marine Corps Supplement to the Department of Defense Dictionary of Military and Associated Terms*.
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ATO	air tasking order
BSTF	Battle Staff Training Facility
C2PC	Command and Control Personal Computer
C4I	command, control, communications, computers, and intelligence
COA	course of action
COE	common operating environment
COP	common operational picture
COTS	commercial-off-the-shelf
CTAPS	contingency theater automated planning system
CTP	common tactical picture
DACT	Digital Automated Communications Terminal
DII	defense information infrastructure
DOD	Department of Defense
EPLRS	Enhanced Position Location Reporting System
EVAC	evacuation system

GCCS	Global Command and Control System
GRIS	Global Reconnaissance Information System
GSORTS	Global Status of Resources and Training
IAS	intelligence analysis system
IPB	intelligence preparation of the battlespace
JDISS	Joint Deployable Intelligence Support System
JMCIS	Joint Maritime Command Information System
JOPEs	Joint Operation Planning and Execution System
JTA	joint technical architecture
LAN	local area network
MAFC	MAGTF all-source fusion center
MAGTF	Marine air ground task force
MCDP	Marine Corps doctrinal publication
MCHS	Marine common hardware suite
MCPP	Marine Corps Planning Process
MCWP	Marine Corps warfighting publication
MEF	Marine expeditionary force
METOC	meteorological and oceanographic
MSBL	MAGTF C4I Software Baseline
MSTP	MAGTF Staff Training Program
MTT	mobile training team
OPLAN	operation plan
OPT	operational planning team
PDE&A	planning, decision, execution, and assessment
SIPRNET	SECRET Internet Protocol Router Network
TCO	tactical combat operations