

C4I-00003

**C4I**  
**FOR THE WARRIOR**

**GLOBAL  
COMMAND  
&  
CONTROL SYSTEM**



**FROM CONCEPT TO REALITY**

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*The C4I for the Warrior concept is the J-6 Directorate's commitment to the challenge of meeting the warrior's quest for information—information needed to achieve victory for any mission, at any time and at any place. The Global Command and Control System (GCCS) is a bold initiative—a much needed approach to give the warrior a true real-time secure picture of the battle space.*

**Albert J. Edmonds**  
Lieutenant General, USAF

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The C4I for the Warrior concept is committed to the challenge of meeting the warrior's quest for information needed to achieve victory for any mission, at any time and at any place. The C4I for the Warrior concept is the vision and a roadmap for providing such information support to the joint warfighter.

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The **C4I** for the Warrior concept is committed to the challenge of meeting the warrior's quest for information needed to achieve victory for any mission, at any time and at any place. The **C4I** for the Warrior concept is the vision and a **roadmap** for providing such information support to the joint warfighter.

Activities necessary to achieve this vision have already been set in motion, and significant progress is being made. A solid foundation for progress is in place in national military strategy, DOD interoperability policy, new **C4I** systems acquisition requirements, and joint warfighting doctrine. The groundwork is clearly established to resolve future interoperability issues and provide new capabilities to the warrior to acquire the necessary knowledge needed for victory in today's information-based world. Victory has been declared in the first phase of the march!

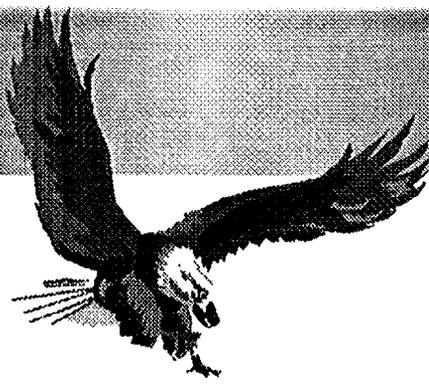
A Midterm Phase goal of producing a global **C4I** system capable of generating and delivering the fused information needed for tactical command decisions is at hand. The Global Command and Control System (GCCS) is evolving to be the joint C4 system of C4 systems, interoperable through common paths and common switches, and for the first time providing the joint forces commander with a true picture of the battle space as earlier envisioned in the **C4I** for the Warrior concept.

The brochure focuses on the GCCS, the support it is receiving from related **C4I** for the Warrior activities, and the progress being made in transforming the **C4I** for the Warrior vision into reality for today's and future warriors.

A handwritten signature in black ink, appearing to read 'John M. Shalikashvili', written over a horizontal line.

JOHN M. SHALIKASHVILI

Chairman  
of the Joint Chiefs of Staff



## PREPARING FOR THE MARCH: SET THE COURSE

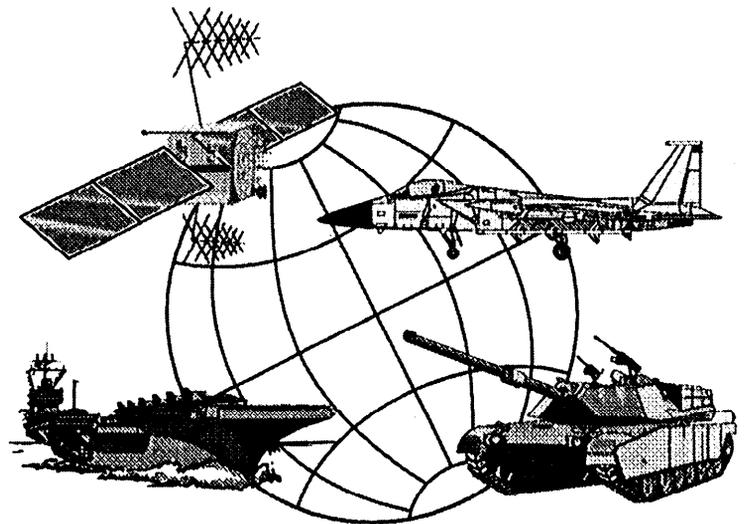
*The C4I for the Warrior concept established unity of effort and is providing the necessary information for warfighters to win on today's and future battlefields.*

The common vision of the C4I for the Warrior concept is to create a broadly connected joint system of joint systems that provides total battle space information to the warrior. This C4I information infrastructure provides seamless connectivity for the warrior to "plug in" and obtain the information, offensive and defensive, needed to carry out any mission, at any time and at any place.

The problems in conducting joint operations because of noninteroperable C4I systems are well known. The great need for interoperability among Service and combatant command (CINCPAC) C2 systems is well established. Organizational and unit integrity, supported by dedicated networks and systems, is essential for the joint force commanders to conduct effective combat operations. Joint operations involving multiple land, sea, and air units in adaptive joint force structures increasingly require joint networks and joint systems that are fully interoperable horizontally across air, sea, space, and ground environments.

The commitment by the Joint Staff, combatant commands, Services, and Defense agencies to the vision of total C4I joint interoperability provides a measure of stability and assurance at a time when the warrior's job requires a quick reaction and adaptive response to uncertain and dangerous situations

**In the C4I for the Warrior concept interoperability is defined as the capability of people, organizations and equipment to operate effectively and efficiently together for successful mission accomplishment. This definition has not changed.**



"We are looking for the 80 percent solutions as we work toward the goal of complete interoperability."

Albert J. Edmonds  
Lieutenant General, USAF  
Director, Command, Control,  
Communications, and Computer Systems, J6  
Joint Staff

The C4I for the Warrior concept is a vision with an accompanying roadmap for realizing the concept. In the past 2 years it has received enthusiastic support, both as a much needed vision and as a pragmatic roadmap to accomplish the vision. The assignment to turn the concept's vision into reality has been a well accepted team endeavor. The job, however, is not finished. The J6 strategy for finishing the job is to go with "winners, measured by the actual warfighter." The roadmap must be flexible enough to accommodate changing warrior requirements, advancing technology, and ever decreasing C4I budgets.

# QUICK FIX VICTORIES



*The Quick Fix Phase paved a new way of doing business and introduced interoperability improvements into the field.*

The initial **C4I** for the Warrior roadmap comprised three phases:

- Quick Fix Phase.
- Midterm Phase.
- Objective Phase.

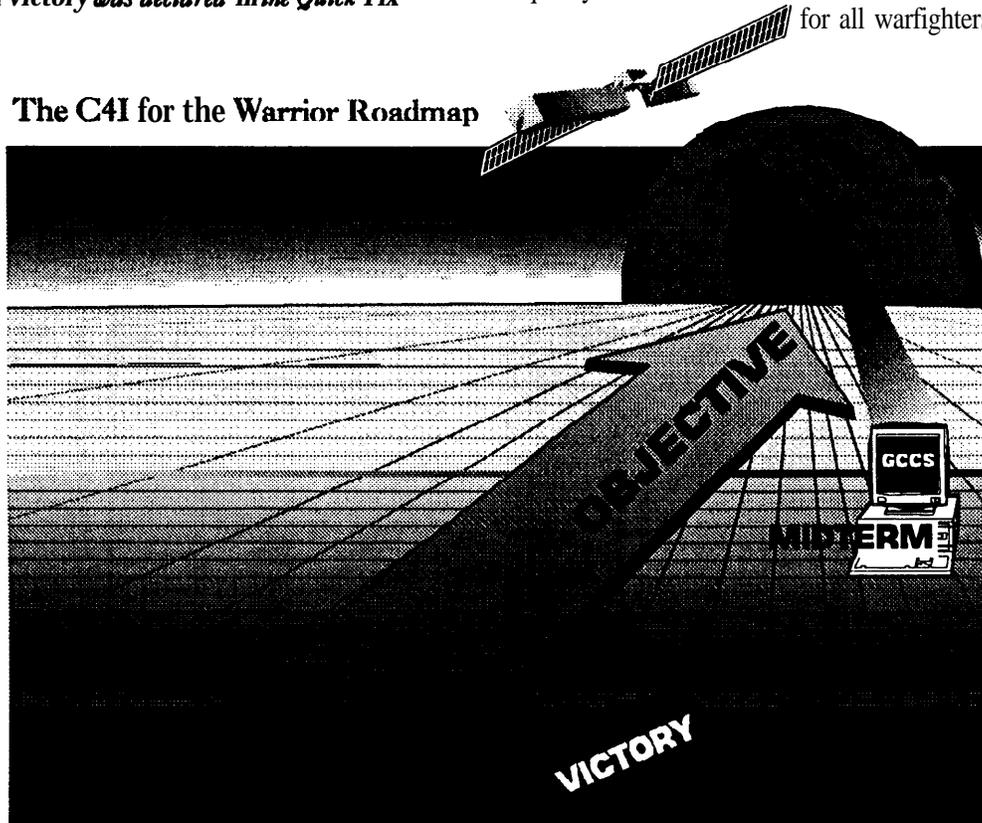
These have not changed.

*The Quick Fix Phase included promulgation of the new C4I for the Warrior concept's paradigm, new policy and doctrine implementers and interoperability design and engineering projects that could be completed quickly and that would result in near-term, high leverage interoperability improvements. These activities have been completed successfully and victory was declared in the Quick Fix Phase in 1993.*

The **C4I** for the Warrior concept has a solid foundation that is now firmly established in strategy, policy, acquisition, and doctrine. This **foundation** will ensure that the warrior's requirements continue to drive the quest for information and interoperability.

The objective is to improve the quality and utility of military needed **information** while reducing the annual cost of military operations without losing sight of the warfighter's perspective. The plan for implementing **the** strategy is to use a migration approach, achieve improved functionality and **cross-functional** integration based on accelerated process improvement reviews and assessments, and incorporate interoperability, technical integration, military standard data, and integrated data bases to provide higher quality and lower cost information technology services for all warfighters.

The C4I for the Warrior Roadmap



## PROOFS OF CONCEPT

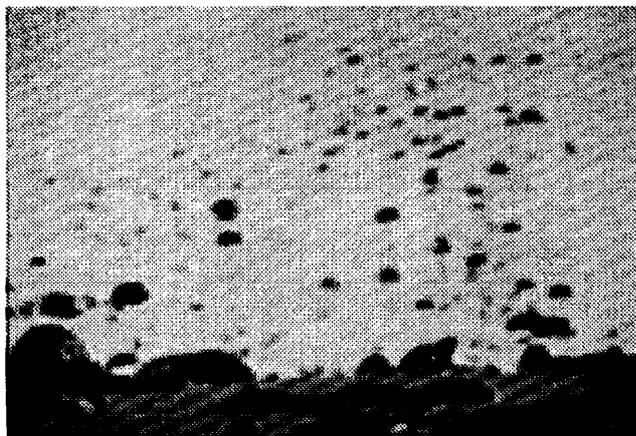
The Joint Universal Data Interpreter (JUDI) was a Quick Fix interoperability initiative. JUDI found a quick technical solution to data format incompatibility and demonstrated that existing systems could be made to interoperate without major modifications. The JUDI approach showed that diverse systems could be integrated effectively and paved the way for the GCCS migration system approach that is now in progress.

The Services have provided their support to the C4I for the Warrior concept through action:

- *The Army 5 Enterprise Strategy sets forth 10 principles that support US Army warfighters into the 21st century and synchronize Army programs with the Joint Staff's C4I for the Warrior concept.*

*"We will rely on America's dynamic new base of available technologies to tailor our fighting force to tomorrow's battlefield."*

*US ARMY, ENTERPRISE*



- *The Navy's Copernicus architecture establishes a framework for restructuring its C4I strategy. It also addresses the challenges of developing new technologies to integrate sensors, facilitate tactical decisionmaking, and solve communications capacity problems. It is a vision for moving into the 21st century.*

*"We have crossed the threshold of the Information Age—an age in which the pace of progress in all fields of human knowledge is hastening forward. The impact of this revolution will be experienced worldwide, presenting both risks and opportunities."*

*US NAVY, COPERNICUS*

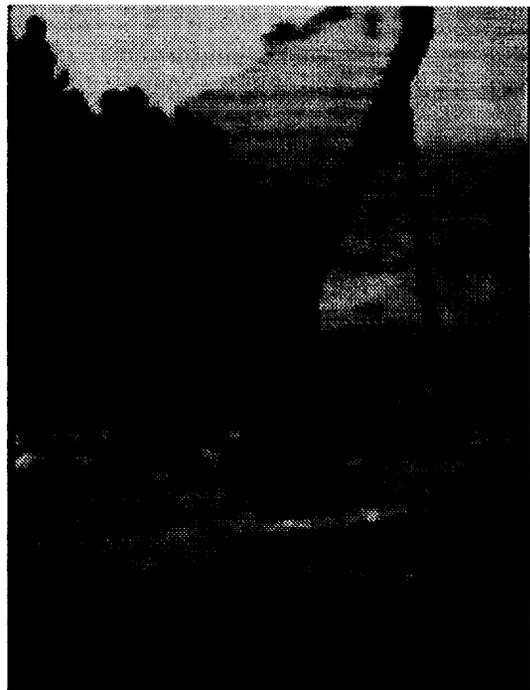
- The Air Force's HORIZON strategy provides a fundamental reference for optimizing **C4I** capabilities from the present day into the **21st** century. Its goal is to evolve present and proposed **C4I** capabilities into an integrated, interoperable, global network—an infosphere—that meets Air Force, joint, and DOD requirements.

**"It is vital that the C4I capability supporting the Air Force in this era of dynamic change not merely keep pace; the C4I capability must be moved ahead, out in front of the waves of change."**

**US AIR FORCE, *HORIZON***



- The Marine Corps' commitment to provide a unique **warfighting** capability that supports the National Military Strategy is predicated on maintaining integrated Marine Air Ground Task Forces (**MAGTFs**). A fundamental component of this capability is modernized, integrated **C4I** systems that support the warfighter. The Marine Corps' MAGTF **C4I** strategy embraces the principles of the **C4I** for the Warrior concept of providing the required information to the warfighter.



**"The measure of command and control effectiveness is simple: either our command and control works faster than the enemy's decision and execution cycle or the enemy will own our command and control."**

**Fleet Marine Force Manual (FMFM) 3, Command and Control**



## NEW WAY OF DOING BUSINESS

The new way of doing business involves the entire **C4I** community and streamlines the organizations and processes concerned with specifying, testing and acquiring **C4I** systems. The Joint Requirements Oversight Council (JROC), a reorganized Military Communications-Electronics Board (MCEB), the Center for Standards within the Defense Information Systems Agency (DISA), and parallel Service and Defense agency organizations are focusing on more effective and efficient **C4I**, using the **C4I** for the Warrior concept's paradigm as the model for matching resources and plans against requirements. In addition to real world opportunities such as Operations DESERT SHIELD and DESERT STORM, joint exercises and operational demonstrations provide realistic conditions for testing new ideas and capabilities.

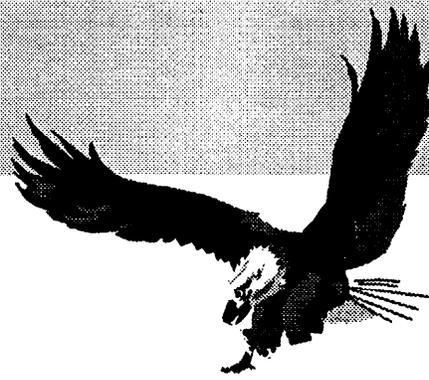
The Joint Warrior Interoperability Demonstration (JWID) 94 will be the fifth in a series of operational demonstrations to show what works and what does not before major **C4I** acquisition commitments are made.

Seventy DOD and vendor demonstrations are currently proposed in the categories of battle space management, collaborative planning, smart push and warrior pull, and interoperability of joint communications and networks.

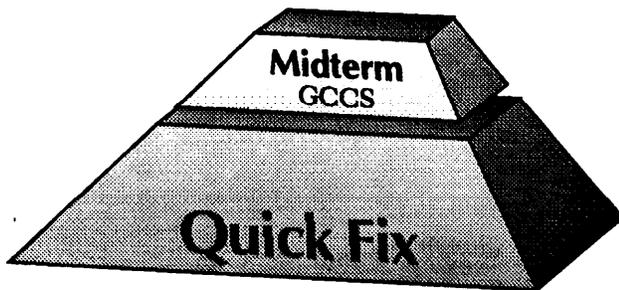
Acquisition streamlining is a key element in the new way of doing business. Standardization, use of commercial off-the-shelf (COTS) hardware and software, and parallel development activities, such as bringing the testers and users into the development process in the early stages, shortens development time and reduces costs.

**GCCS will profit from the new way of doing business. It is not a GRAND DESIGN effort, and it is not a 100-percent solution. It is an initiative that goes a long way toward eliminating inflexible stovepipe systems and expensive duplication. And it is doing it today.**





## THE MARCH



*The Midterm Phase demonstrates the initial operational capabilities of the GCCS "system of systems" and sets in motion the process for selecting and implementing "best of breed" migration systems and technology insertion projects.*

*GCCS responds to the warrior's need for a fused, real-time true picture of the battle space and the need for the ability to order, respond, and coordinate vertically and horizontally to the degree necessary to prosecute the mission in the battle space.*

### **MIGRATION:**

The systematic selection, introduction, and assimilation of existing system software functionalities into GCCS core functions, operating in the GCCS common operating environment.

### **LEGACY SYSTEM:**

A legacy system consists of the older hardware or software components of an existing system that are replaced or modified by newer implementations.

### **GCCS COMMON OPERATING ENVIRONMENT (COE):**

Computer applications programs that support the fundamental processes involved in planning and conducting military operations.

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"As always, the perspective of the warfighter must be maintained throughout the selection process."

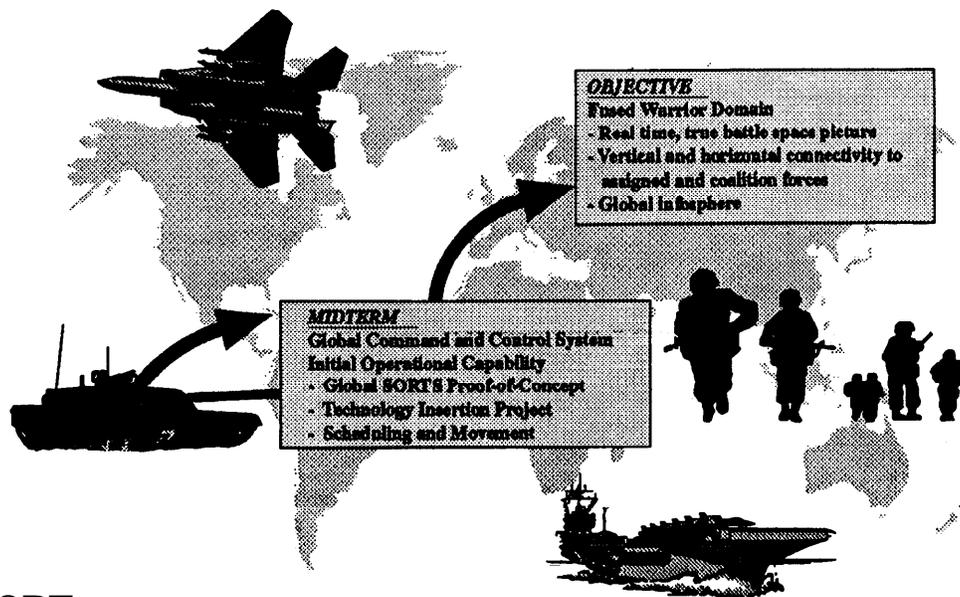
Honorable Emmett Paige, Jr.  
Assistant Secretary of Defense  
(Command, Control,  
Communications & Intelligence)  
20 December 1993

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The **Midterm Phase** in the form of GCCS is marching toward the **C4I** for the Warrior concept's vision of an objective. The interoperability targets of this phase are being realized through "right sizing," prototyping, tactical system enhancements, and migration of "best of breed" Service and Defense agency existing legacy systems into GCCS. Achievements include:

- System development and modernization programs, such as GCCS, are using new, streamlined, evolving selection and certification procedures that respond **directly to the warfighters'** requirements.
- Fixed, untransportable, and tactical communications are rapidly achieving a high degree of applications standardization and levels of interconnectivity capable of supporting joint or multinational operations, independent of time, space, and sponsorship considerations.
- Unique military standards and devices are giving way to commercial standards.
- The components of the global **C4I infrastructure** supporting joint operations continue to evolve toward a single interoperable system, GCCS.

## ***GCCS: The Bridge to the C4I for the Warrior Objective***



### **C4I SUPPORT FOR THE WARFIGHTER TODAY: THE NEED FOR GCCS**

All military **C4I** systems have one **job**—to support the warfighter. GCCS provides the best opportunity for establishing an effective, efficient bridge to the **C4I** for the Warrior concept's objective. It incorporates the core planning and assessment functions identified and needed by the commanders of combatant commands (**CINCs**) and their joint force commanders, and it **meets** the readiness support requirements of the Services while accommodating their unique regional and functional information requirements.

Too many stovepipe systems and too much duplication exist in the **C4I** arena. GCCS provides an effective baseline vehicle for implementing the much needed **C4I** system consolidation and migration strategy.

#### **GCCS CORE FUNCTIONALITY:**

The GCCS core consists of the basic functions required by a warfighter to plan, execute, and manage military operations. These basic functions are satisfied by selecting the "best of breed" applications from existing **C2** systems. This process ensures interoperability, minimizes training requirements, and allows efficient use of limited defense resources.

#### **RIGHT SIZING:**

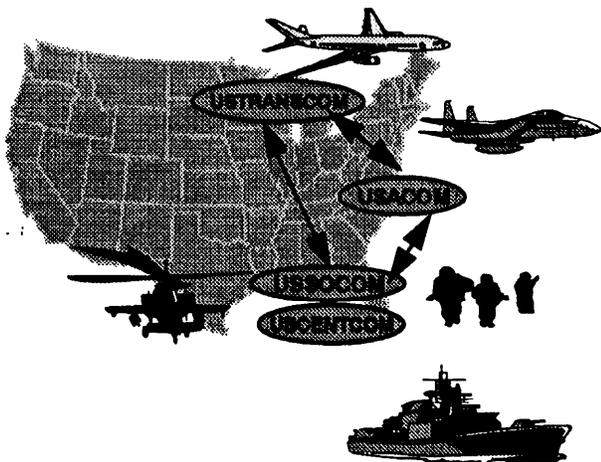
A conceptual tenet that has allowed us to transition technical potential to reality. Right sizing is the matching of performance, schedule, and cost to the objective.

The migration process selects from among all candidate systems those that are best at the jobs they do in support of the warfighter and migrates those capabilities into GCCS. The **CINCs** have identified the core functions as:

- Crisis Planning.
- Force Deployment.
- Force Employment.
- Force Status.
- Logistics.
- Air Operations.
- Fire Support.
- Intelligence.
- Personnel.
- Position.
- Narrative Information.

The approach remains simple and straightforward. GCCS will be implemented one step at a time applying user feedback to build the next step. There is no Grand Design.

## GCCS June 94



Gone are the days when the user establishes a requirement and 5 to 10 years later is provided a solution. GCCS is providing **warfighters** a Secret High, user friendly, interoperable, and flexible system when wanted and needed-today.

GCCS implements a flexible, highly adaptable client **server** architecture, tailored specifically to the needs of the warfighter — as expressed by the warfighter. It nonetheless preserves the “best of breed” capabilities of existing systems, including the World Wide Military Command and Control System (WWMCCS).

GCCS provides connectivity among the CINC components; up-to-date, accurate operational availability data; and a consistent, complete and realistic graphical representation of the tactical picture in the warfighter's battle space.

*GCCS responds to the need for providing joint force commanders the ability to totally configure their forces as needed to fight and win. It will encompass all of the capabilities needed to be able to do so.*

## THE C4I SUPPORT TO THE WARFIGHTER PROCESS: HOW GCCS WORKS

*GCCS is an evolving global, flexible, and interoperable C4I system that is dedicated to supporting the warfighter. GCCS is the C4I for the Warrior concept in action. It encompasses the policies, procedures, personnel, automated information processing systems, common communications paths, and common switches necessary to plan, deploy, sustain and employ forces when needed at any place, any time, and for any mission.*

**“User involvement is critical to the success of GCCS. The final product will depend upon your early input.”**

**J.J. Sheehan  
Lieutenant General, USMC  
Director for Operations, (J3)  
Joint Staff**

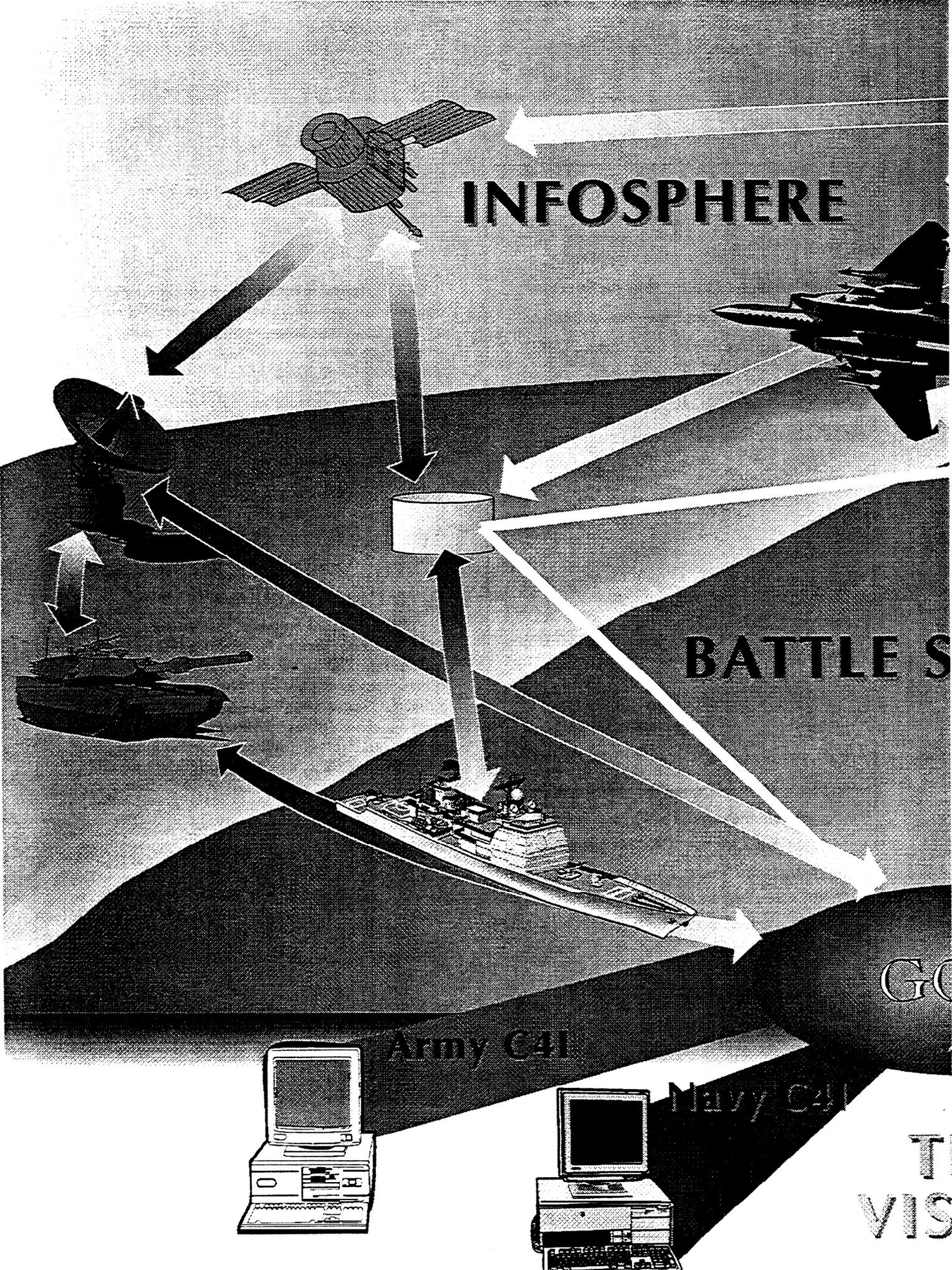
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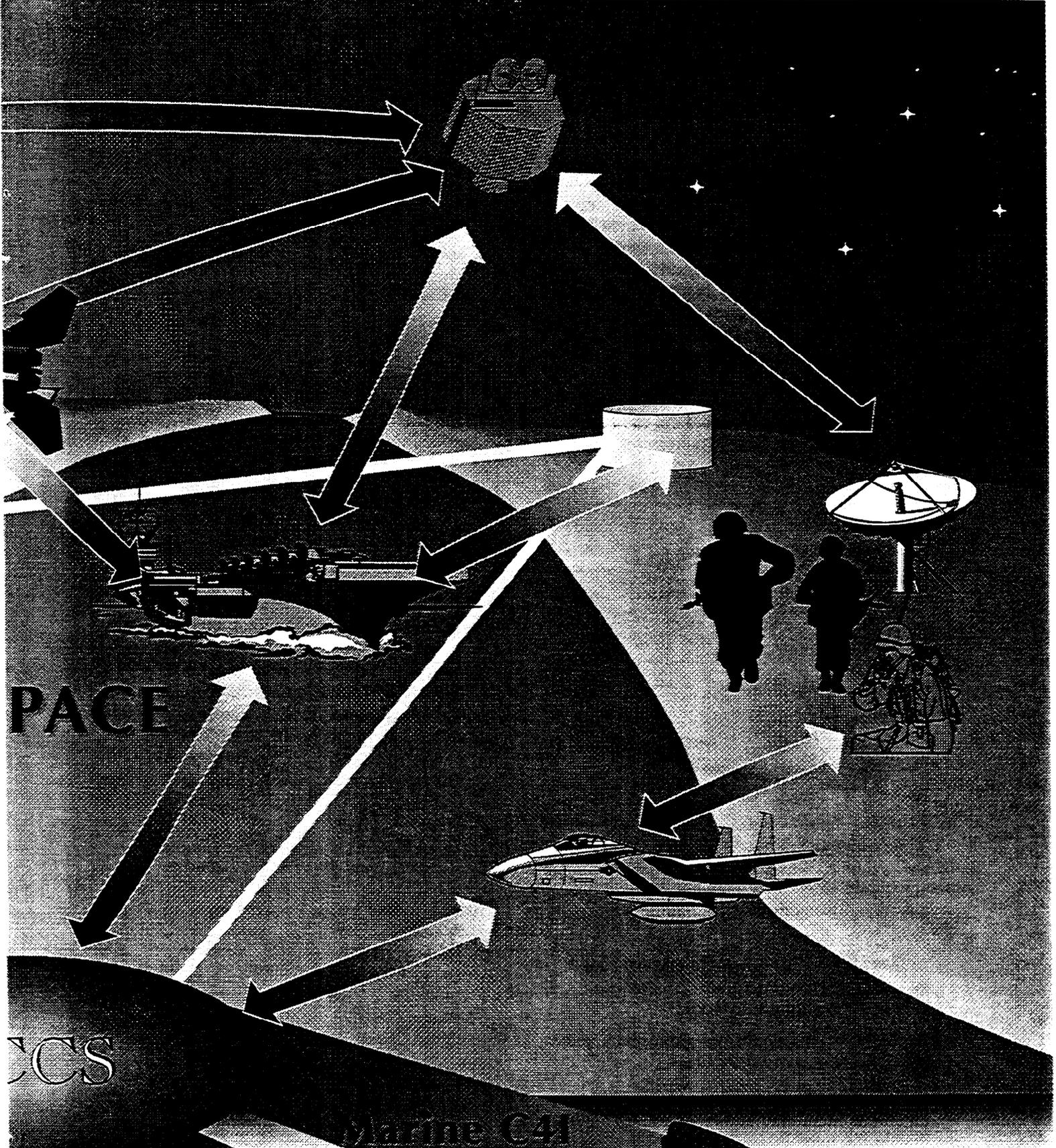
**BATTLE S**

**Army C4I**

**Navy C4I**

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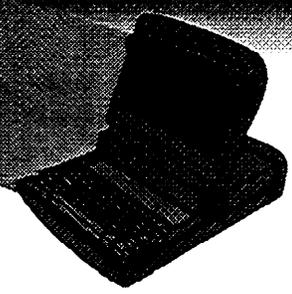
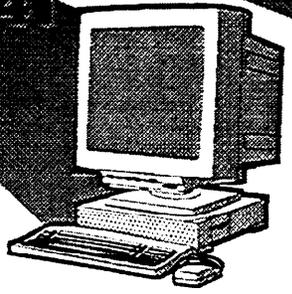
PACE

PCS

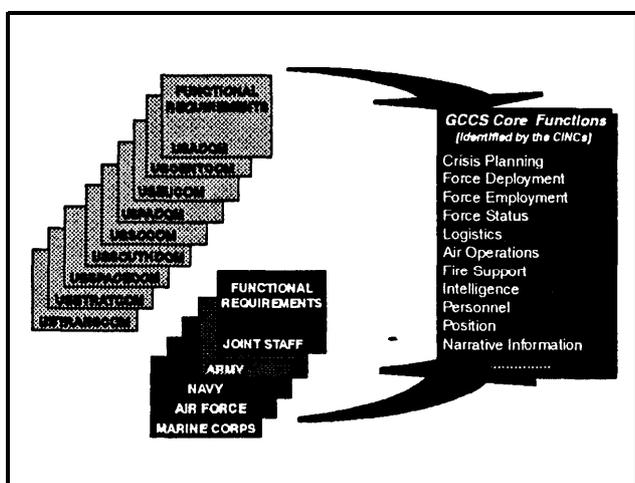
Marine C4I

Air Force C4I

THE  
ION



GCCS is a premier C4 initiative and is capturing the best of the old and the new, as determined by the war-fighters. Its capabilities have been demonstrated in action and the first of many evolutionary hardware and software improvements are now being fielded. GCCS is a worldwide system of systems for **C4I** support to joint and multinational operations. It supports all missions in all warfighting environments and is the **J6** Directorate's priority **C4** effort. GCCS provides the interoperable, interconnecting framework among the National Command Authorities and the operating and support elements of the national military establishment.



The first priority for the GCCS is to demonstrate the vision of the **C4I** for the Warrior concept by becoming a globally connected, warrior-involved, interoperable, fully integrated **C4** system. It will:

- Be flexible, enduring, adaptable, maintainable, and meet the dynamic information processing needs of war-fighters at all levels.
- Be developed with **warfighter** involvement in the modernization process at all times.
- Use standardized hardware and software components that lead to modular, portable, and easily maintainable software implementations.
- Be integrated into joint exercise systems so that the actual warfighters will be able to train under real conditions.
- Be cost-effective.

### GCCS TESTING

GCCS testing is based on a process of continuous comprehensive evaluation. Testing evaluates the operational effectiveness and suitability of GCCS in a warrior-oriented environment. It verifies that GCCS meets the operational needs of users from the National Command Authorities to joint task force commanders and that GCCS provides an interoperable, fully integrated C4I system for the warfighter. The testing process tracks the progress of GCCS throughout the development and installation by analysis of all available data from a wide variety of sources. Testing is accomplished incrementally as additional functionality is added to the system. It provides complete, accurate, and timely evaluation information in support of GCCS.

The data from the testing support GCCS in three areas. First, it provides input on nominated candidates to support the "best of breed" selection process. Second, it supports system integration into the GCCS environment by providing data on how well the new system operates in its environment. Third, the testing information provides feedback to determine satisfaction of warrior requirements and facilitates changes to GCCS.

**UNDERSTANDABLE INFORMATION**  
 Interoperability is not limited to information sharing.  
 The way in which information is presented is as important as its availability.

**Old Method**

- Not user friendly
- Six week school to train
- Expensive to change code

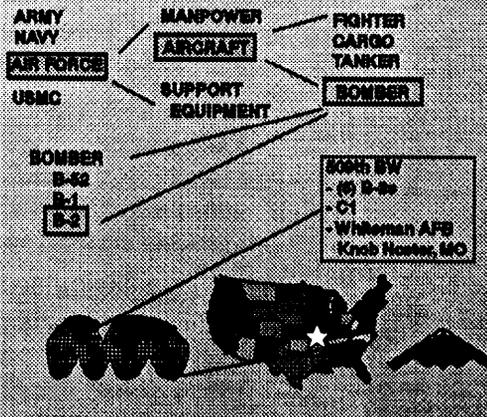
```
SELECT 10.ANAME,11.MEQPT
      11.MEPSA,11.MEORN
      11.MEORD
FROM GEOT 10.MELLONG
WHERE 11.UIC(4)=10.UIC
AND (10.UIC = '1499999')
```

- Output not easily readable

ANAME	MEQPT
1ST BN 2D MAR	105 HOWTD
1ST BN 2D MAR	AAVC7A1
1ST BN 2D MAR	AAVP7A1
1ST BN 2D MAR	LAV48
1ST BN 2D MAR	LAAN65AT
1ST BN 2D MAR	M101A1

**New Method**

- Menu/Mouse driven
- Train user in hours at home station
- Graphical displays



When you install software for your home or office computer, can you afford to go away for 6 weeks to learn how to use it? Neither can the warrior.

the Navy and the Air Force. The end results will be the elimination of duplication and increased interoperability among the joint **C4I** community.

GCCS will reengineer and migrate only the WWMCCS applications the warfighters require. Migrating these functions to GCCS in rapid succession will provide a solid, self-sustainable core and will allow effective use of a unified data base. It is expected that as warfighters draw increasingly from GCCS, their dependence on other systems will diminish, and eventually the legacy systems will no longer be needed. Warfighter selected WWMCCS functions will migrate to GCCS within the next 2 years. Unique systems will continue to be operated and supported only if their functionality does not exist on GCCS and a strong operational requirement is provided.

To ensure a successful GCCS implementation:

**BRINGING C4I SUPPORT TO THE WARFIGHTER: GCCS ACTIONS AND ACCOMPLISHMENTS**

GCCS is building on the **C4I** for the Warrior concept's foundation and is being implemented through an evolutionary strategy of right sizing and migration. **GCCS will be no larger or smaller than actually needed by the warfighter.** It is not a grand design system. GCCS features and **functionalities** will be selected from among existing **C4I** systems, and "best of breed" characteristics will be integrated into a common operating environment. As examples, consolidation of numerous force readiness status systems into a single system is taking place and action is in progress toward a single weather system that will serve both

- Software will undergo thorough laboratory testing before release to the field.
- Current WWMCCS capabilities will be maintained until warfighters are satisfied with GCCS functionality.

"Any military-like any company or corporation -has to perform at least four key functions with respect to knowledge. It must acquire, process, distribute, and protect information, while selectively denying or distributing it to its adversaries and/or allies."

Alvin and Heidi **Toffler**  
*War and Anti- War*

## GCCS TRAINING

GCCS training will be synchronized with GCCS fielding. Quality training is an essential step in meeting the established goal for shut-down of WWMCCS hosts and migration of essential WWMCCS capabilities to GCCS.

As a key first step toward meeting this goal, a GCCS Single Service Training Manager (SSTM) is being established. A training concept is being developed and WWMCCS SSTMs are building the framework for GCCS functional and technical training.

GCCS system administration training has already been scheduled and the GCCS COE course will be available in July 1994. The COE course will provide training on the infrastructure of GCCS, which provides platform services and support applications such as e-mail, word processing, conferencing, and spreadsheets. In the interim, contractor training is being provided during fielding.

The composition and roles of GCCS on-site teams are being defined, and associated training requirements are being addressed.

GCCS is being fielded and tested as improvements take place. *Active participation in the process by the combatant commands and Services is the key to success. GCCS is a warfighter-driven system. It is the baseline system for command and control and its vastly improved capabilities, in prototype versions, have already proved their worth in the field.*

GCCS reengineering and development will be in versions. The first and ongoing version is the Proof-of-Concept. The goal for the Proof-of-Concept version is to form the GCCS core, which initially will be made up of a variety of functionalities such as:

- Tactical Displays.
- Message Handling.
- Air Tasking Order (ATO) Dissemination.
- Readiness Status.

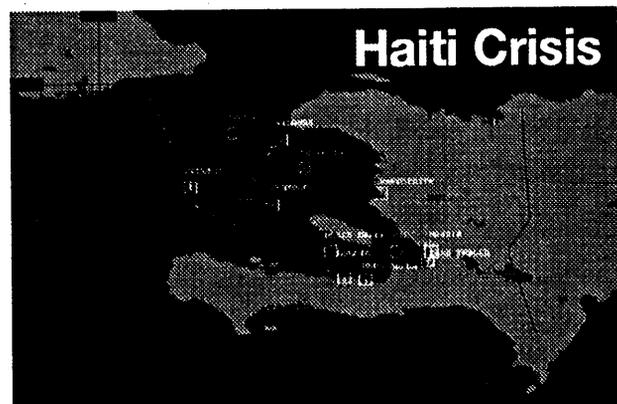
The core will grow as GCCS is implemented.

In June 1993, the GCCS first stage Proof-of-Concept version was demonstrated to senior representatives from the combatant commands, Services, and Defense agencies. The National Military Command Center (NMCC), US Atlantic Command (USACOM), US Special Operations Command (USSOCOM), and US Central Command (USCENTCOM) were linked and successfully used:

- The residual Status of Resources and Training System (SORTS) application and data.
- A new user-designed interface.
- Standard Defense Mapping Agency maps and charts.
- COTS equipment, software design and support tools, and operating system.

In early October 1993, a crisis action team (CAT) was activated in the USACOM Joint Operations Center (JOC) to carry out Haitian combined operations planning activities among national security, national defense, and allied decisionmakers.

Coincidentally, a GCCS proof-of-concept version was installed shortly after the CAT was activated. It was placed into operation immediately and was met with universal acceptance and acclaim. The GCCS continues to be used by USACOM to view the tactical situation in near-real-time and to monitor the readiness and deployment status of the joint task force.



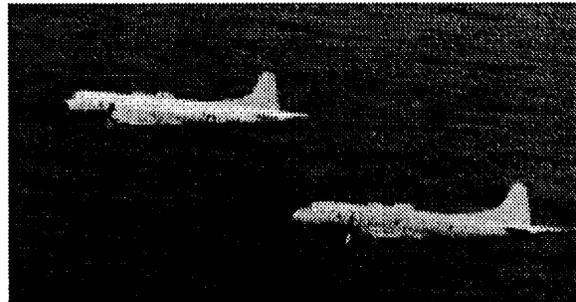
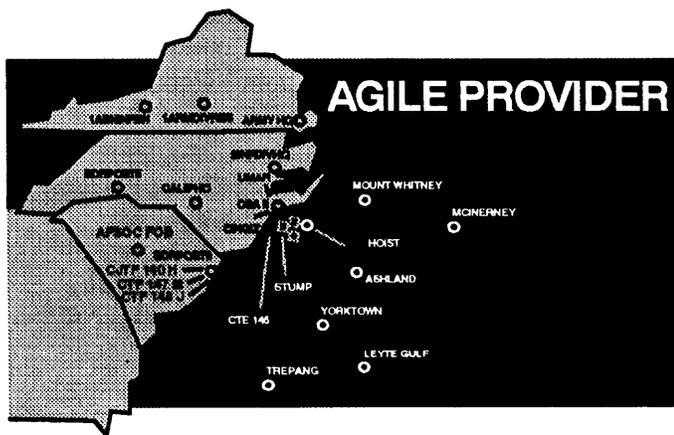
*Both the GINC and CJTF were able to simultaneously view a collective laydown of red and blue ground, seaborne and airborne forces operating in the joint operating area (JOA) on a single G2 screen.*

Graphical displays replaced text and the CINC had clear, easily readable readiness data as well as imagery and connectivity to his four components—all at his fingertips.

In February 1994, the GCCS prototype implementation between USACOM and the US **Transportation** Command (USTRANSCOM) was established. This accomplishment directly links a war-fighting CINC with the information available to a critical supporting CINC and provides a significant opportunity to test the **C4I** for the Warrior concept's information "pull" and "push" tenets.

In May 1994, a postexercise report from USACOM stated that GCCS "met or exceeded all exercise objectives, and provided significant increase in **C2** function to USACOM." During AGILE PROVIDER 94, the capability of GCCS to provide a common picture of the battle space was tested as an objective of **USACOM's** joint field training exercise, designed to uain forces in the planning and conduct of joint combat operations.

Version 2.0 of GCCS will be inuoduced in late 1994. GCCS will be implemented at each CINC, and testing of the Scheduling and Movement functionality will begin. A foreseeable challenge is converting the Joint Operations Planning and Execution System (**JOPEs**) from its current mainframe environment into one more usable by GCCS.



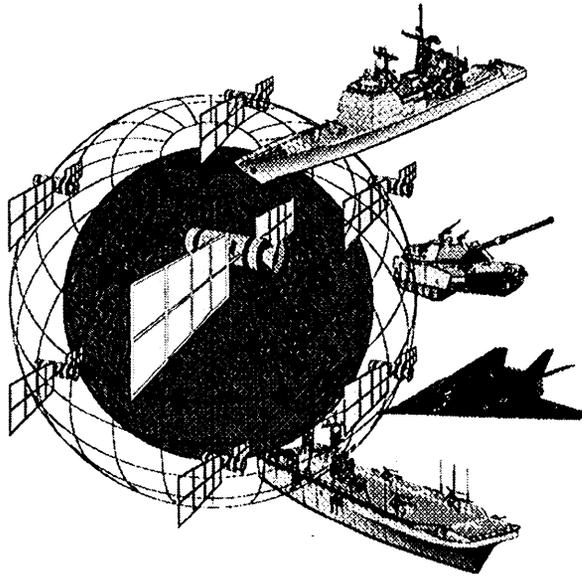
## COMMON PIPES AND COMMON SWITCHES

The Defense Information Systems Network (DISN) and ongoing efforts for providing common tactical switches will provide much of the enabling connectivity to bring the GCCS pieces together in reaching the **C4I** for the Warrior concept's objective.

DISN is the DOD consolidated worldwide enterprise level telecommunication infrastructure that provides the end-to-end information transfer network for supporting military operations. It is transparent to its users and is responsive to national and security needs under all conditions. DISN provides long haul end-to-end common user and dedicated telephone, data, and video service.

DISN will interoperate with the Federal Telephone System (FTS 2000), which will provide the following services:

- Switched voice service for transmission of voice and dam. This service allows the fast transfer of information from host and personal computers, facsimile machines, and other equipment when the traffic is not sufficient to justify a dedicated line.
- Video transmission service for compressed video and full motion teleconferencing.
- Packet switched service for data transmission in a packet format.
- Dedicated uansmission service for voice **point-to-point** line service.
- Switched digital integrated service for the integrated transmission of services using **T-1** or the Integrated Services Digital Network (ISDN).



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“The joint campaign should fully exploit the information differential, that is, the superior access to and ability to effectively employ information on the strategic, operational and tactical situation which advanced US technologies provide our forces.”

JOINT PUB 1

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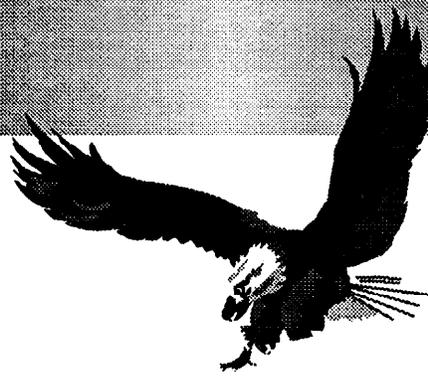
Plans are underway for the migration of software baselines of eight different switches, which currently use different routing algorithms and data rates into a single enhanced software baseline package. Operation of tactical switching networks will be simplified and maintenance will be easier. The baseline will be used as a conduit for the migration of switching networks toward COTS products, thereby producing a larger, integrated network of common switches.

In late 1993, the space-based Global Positioning System (GPS) constellation became operational and is now capable of providing **24-hour** worldwide, **all-weather**, passive, three-dimensional position, velocity and timing data to US and allied military forces. GPS will be integrated into virtually every platform and weapon system by 2000. The result will be enhanced situational awareness information, available to the warfighter as a component of GCCS.

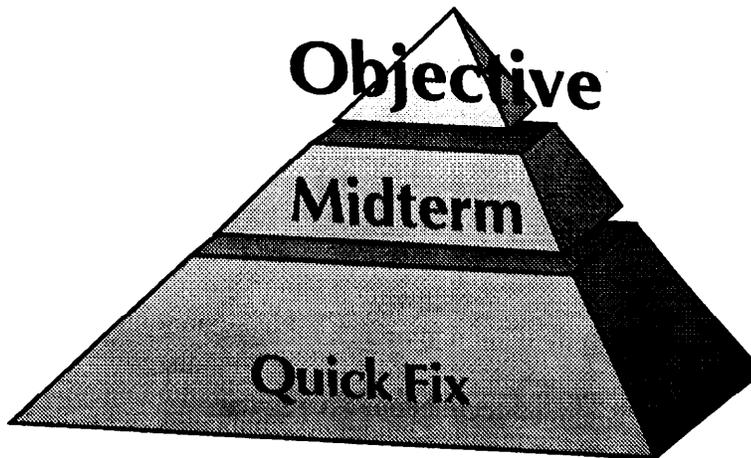
An adversary's **C4I** system is an attractive military target. Conversely **C4I** Protect is important to **successful** military operations. In addition to providing a rapid flow of accurate information, the **C4I** for the Warrior concept must establish **C4I** systems resilient to actions that degrade the system components-people,

procedures, communications paths, switches, hardware and software, and the information itself. Under the provisions of the J3 Directorate's **C2** warfare concept, the J6 Directorate will protect the availability and integrity of information needed by the warrior. The **C4I** technology revolution, the information explosion, commercialization of DOD communications paths and switches, use of COTS products, and decreased frequency spectrum availability are considerations that impact the availability of information as it applies to all traditional warfighting disciplines. In response, **C4I** Protect measures are integral to the **C4I** for the Warrior concept's "march."

***GCCS implementations are going to meet the C4I requirements of the National Command Authorities, CINCs, joint force commanders, Services, and supporting commands. GCCS will also provide information processing technologies required for the CINCs to develop and execute the plans and contingencies that support our national military strategy.***



## THE WARRIOR'S SOLUTION: ONE COMMON SYSTEM



*GCCS guides the march toward the vision.*

GCCS's newest Proof of Concept implementation has been demonstrated successfully. A documented concept of operations is being developed and efforts continue uninterrupted to realize the vision of a **uni-**fied, interoperable, and global **C2** system. The success of GCCS implementation is related directly to the involvement of **warfighters** as well as support from the Services and Defense agencies, particularly since the GCCS implementation strategy relies heavily on reuse of existing software and warrior input.

GCCS is not a hardware acquisition project and will be hardware independent. It will have a standardized COE and provide core applications to achieve warrior-specified **performance** needs and interoperability objectives. For example, GCCS will be UNIX-based. A **comprehen-**

sive approved products list is being promulgated to allow warfighters to acquire hardware that meets GCCS technical interface specifications. GCCS will evaluate and select for reuse applications from **candi-**date systems recommended by the Services and Defense agencies, within the goals established for functional capabilities, performance, interoperability, and cost. The selection process is an objective, partic-

ipatory evolution that will result in the migration of software applications certified by previous **warfight-**en and endorsed by current **warfighters**. The process will be subject to approval by the **J3** and the **J6**, and reviewed periodically by the Assistant

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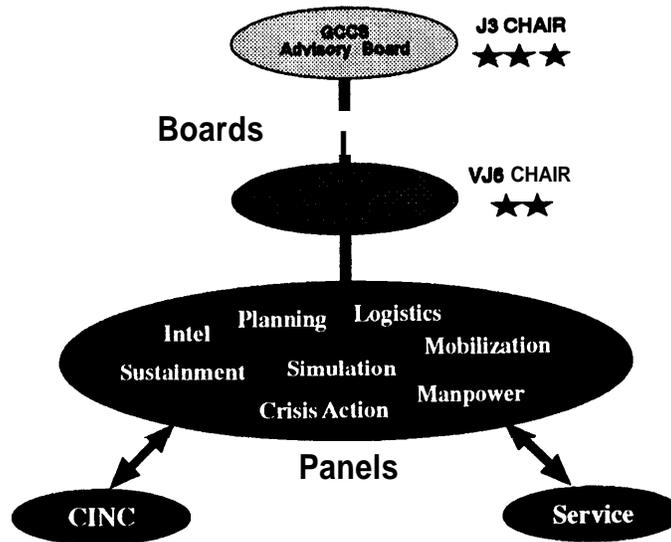
**“I will support only one [Joint] Command and Control System.”**

General John Shalikashvili  
Chairman of the  
Joint Chiefs of Staff

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Secretary of Defense (Command, Control,  
Communications and Intelligence).

# THE C4I FOR THE WARRIOR VISION



*GCCS Management Structure*

*TAG Objective Phase uses continually advancing technologies and experience gained during earlier and ongoing initiatives to achieve optimized C4I support for the warrior.*

The **C4I** for the Warrior concept has a vision that includes:

- A GCCS foundation leading to a **C4I** for the Warrior global national military security **C4I** infrastructure.
- An integrated battle space defense information infrastructure that embodies the mechanisms for meeting the warrior's quest for the information needed to achieve **victory**.
- Highly mobile tactical **C4I** nodes which are **integral** to the warrior's functional assignment and which will provide all information needed to formulate the knowledge necessary for victory.

Effective management of the GCCS evolution, including development, implementation, security, operation, and maintenance, is essential to ensure that the system is responsive to the needs of the **warfighter**. The Chairman of the Joint Chiefs of Staff is **ultimately** responsible for policy guidance and oversight of GCCS. The GCCS Advisory Board, composed of representatives from the Joint Staff directorates, Services, and DISA, is responsible for implementation. A separate GCCS division (**J6V**) has been **estab-**

lished in the **J6** Directorate to fulfill the Joint Staffs system sponsorship and implementation **responsibilities**, which include requirements review and planning, funding allocation, and DISA project management liaison.

The **C4I** for the Warrior concept is becoming reality. GCCS is real, as are other **C4I** initiatives that were not addressed in detail in this brochure. Work continues in interoperability engineering, standardization, and information technology insertion. Standardization of data elements and interface **protocols**, multimedia systems with multilevel security features, and software tools that are easier to use, faster, and better tailored to the functions of the user are needs that are recognized.

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“We are not building a perfect system. We’re building one that meets the warrior’s needs.”

Albert J. Edmonds  
Lieutenant General, USAF

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GCCS will operate on an evolving joint network of joint networks for all worldwide military and government communications traffic with interconnection to the global information infrastructure. GCCS and related initiatives will fulfill the vision of the Objective Phase of the **C4I** for the Warrior concept of fused real-time situational awareness knowledge in all of its dimensions, fully integrated horizontally and vertically.

The promise of the **21st** century depends upon the commitment to the quest for **information**, to the knowledge that it brings, and to the understanding of how best to use that knowledge in support of the warrior's march.



**“Committed, Focused,  
and Needed”**

**C4I FOR THE WARRIOR**



The **C4I** for the Warrior Concept  
Architecture and Integration Division (**J6I**)

**J6, Joint Staff**

The Pentagon

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**J6, Joint Staff**

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*“The history of command can thus be understood in terms of a race between the demand for information and the ability of command systems to meet it.”*

Martin Van Creveld  
*Command in War*

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*“What the Warrior Needs: A fused real time, true representation of the Warrior’s battle space - an ability to order, respond and coordinate horizontally and vertically to the degree necessary to prosecute his mission in that battle space...”*

Richard C. Macke  
Vice Admiral, USN  
*C4I for the Warrior*  
12 June 1992

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