

# ARCHIVED REPORT

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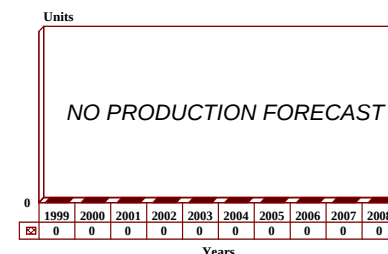
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## WWMCCS - Archived 8/2000

### Outlook

- System deactivated June 30, 1997
- Functions consolidated into and replaced by GCCS
- GCCS now the lead system
- **BARRING ANY SIGNIFICANT ACTIVITY, THIS REPORT WILL BE ARCHIVED NEXT YEAR, 2000**

10 Year Unit Production Forecast  
1999-2008



### Orientation

**Description.** The Worldwide Military Command and Control System (WWMCCS) was a US Department of Defense (DoD)-wide command and control program. On June 30, 1997, the system was deactivated and its functions placed under the control of the Global Command and Control System (GCCS) which is now the lead system.

#### Sponsor

US Air Force

USAF Materiel Command  
Electronic Systems Center (ESC)  
Hanscom AFB, Massachusetts (MA)  
USA  
(Joint program management)

#### US Army

Army Information Systems (AIS)  
Engineering Command (ISEC)  
Fort Belvoir, Virginia (VA)  
USA  
(AWIS Project Management Office)

#### US Navy

Space and Naval Warfare Systems Command (SPAWAR)  
Arlington, Virginia (VA)  
USA  
(Navy program management, WIS Modernization)

#### Defense Information Systems Agency (DISA)

Center for Command, Control and Communications Systems  
Washington, DC  
USA

#### Prime Contractors

##### GTE Corp

GTE Government Systems  
Strategic Systems Group  
77 A Street  
Needham Heights, Massachusetts (MA) 02194  
USA

Tel: +1 617 449 2000

Fax: +1 617 455 5222

(Former engineering and integration prime contractor, was prime contractor for JOPES before that program was terminated)

##### Honeywell Inc

Honeywell Federal Systems  
7900 Westpark Drive  
McLean, Virginia (VA) 22102  
USA

Tel: +1 703 827 3330

(Prime for WAM)

## Contractors

Advanced Technologies Inc  
 Reston, Virginia (VA)  
 USA  
 (Navy support)

Aerospace Corp  
 El Segundo, California (CA)  
 USA  
 (DISA support)

Andrulis Research Corp  
 Bethesda, Maryland (MD)  
 USA  
 (Navy support)

Apple Computer Inc  
 Apple Federal Systems Group  
 Reston, Virginia (VA)  
 USA  
 (Macintosh IIx computers running AUX for WIS)

BDM International Inc  
 McLean, Virginia (VA)  
 USA  
 (DISA support)

Booze-Allen-Hamilton  
 Bethesda, Maryland (MD)  
 USA  
 (Navy and DISA support)

Computer Sciences Corp  
 Systems Engineering Division  
 Falls Church, Virginia (VA)  
 USA  
 (JOPES Increment 1 extension)

Contel Federal Systems Inc  
 Marina del Rey, California (CA)  
 USA  
 (Contractor logistics support for ADP modernization)

EER System3 (VA)  
 USA  
 (IV&V support for AWIS)

HFSI Inc  
 McLean, Virginia (VA)  
 USA  
 (Support for WWMCCS)

IBM Corp  
 Gaithersburg, Maryland (MD)  
 USA

Institute for Defense Analysis  
 Alexandria, Virginia (VA)  
 USA  
 (DISA support)

M/A-COM Government Systems Inc  
 Vienna, Virginia (VA)  
 USA  
 (DISA support)

MIT  
 Lincoln Labs  
 Lexington, Massachusetts (MA)  
 USA  
 (DISA support)

MITRE Corp  
 Bedford, Massachusetts (MA)  
 USA  
 McLean, Virginia (VA)  
 USA  
 (USAF and DISA support)

Planning Research Corp  
 McLean, Virginia (VA)  
 USA

RMS Technologies  
 Trevoze, Pennsylvania (PA)  
 USA  
 (Support)

Science Applications International Corp  
 McLean, Virginia (VA)  
 USA  
 (DISA support)

System Planning Corp  
 Arlington, Virginia (VA)  
 USA  
 (DISA support)

TAI  
 Alexandria, Virginia (VA)  
 USA  
 (AWIS program management and site support)

Titan Inc  
 Vienna, Virginia (VA)  
 USA

TRW Inc  
 Fairfax, Virginia (VA)  
 USA  
 (AWIS software development)

Vitro Corp  
 Silver Spring, Maryland (MD)  
 USA  
 (Technical and project support services for Army WWMCCS)

Status. WWMCCS functions have been consolidated and placed under the control of GCCS.

Total Produced. Not applicable.

**Application.** The mission requirement for WWMCCS was to assist the Joint Chiefs of Staff (JCS) and the National Command Authority (NCA) in conventional warfare planning and execution through the monitoring of land, sea, air and space defense resources.

WWMCCS provided automatic data processing and telecommunications support.

**Price Range.** Indeterminate due to the nature of the overall program.

## Technical Data

**Design Features.** The WWMCCS concept first evolved in the mid-1960s as a network of warning sensors, computer systems and telecommunications to be used by the NCA, the Chairman of the JCS (CJCS) and the Commanders-in-Chief (CINCs) of the Unified and Specified Commands to control US military forces throughout the world in peacetime, crisis or war.

The system provided, through satellite and radar sensors, early warning and attack assessment to help the NCA select appropriate retaliatory action, to transmit emergency action messages, to transmit damage assessment information, and to transmit messages to terminate US action. Information traveled on WWMCCS telecommunications networks to North American Air Defense Command (NORAD) headquarters at Cheyenne Mountain, Colorado; to Air Combat Command, US Strategic Command headquarters at Offutt AFB, Nebraska; to the National Military Command Center (NMCC) in the Pentagon; to the alternate NMCC at Fort Ritchie, Maryland; and to the alert Advanced Airborne Command Post (AACP) E-4B at Andrews AFB, Maryland.

WWMCCS tied together over 80 different satellite, radio and land-line communications systems into approximately 30 command centers throughout the world. The National Military Command System (NMCS) was the primary subsystem of WWMCCS. The Minimum Essential Emergency Communications

Network (MEECN) was a subsystem of WWMCCS, including the Ground Wave Emergency Network (GWEN). National and tactical intelligence systems, tactical command and control systems of the US armed forces, and NATO command and control systems, while not part of WWMCCS, interfaced with WWMCCS to deliver information. Presidential communications, supplied by the White House Communications Agency, were not part of WWMCCS, but they interfaced with WWMCCS through NMCS. WWMCCS also interfaced with other systems, both within the military and without, such as the State Department diplomatic telecommunications system.

The WWMCCS concept as it developed in the 1960s, and the software and hardware developed in the 1970s to support it, focused primarily on the threat of strategic nuclear war and the resulting necessity for command and control of Single Integrated Operating Plan (SIOP) forces. Since that time, increasing emphasis had been placed upon the remainder of the spectrum of conflict, reflecting the urgent world experience in terrorism and local conflicts. This added to the primary mission of supporting NCA in a nuclear crisis and the secondary mission of supporting NCA in the event of a conventional war in Europe, a tertiary mission of supporting NCA in global crisis action management.

## Variants/Upgrades

The WWMCCS Information System (WIS) was a modernization program directed by the US Congress to provide worldwide data collection and information processing, allowing rapid and reliable exchanges of information to support mobilization, employment, deployment, and sustainment of forces.

When the mission needs for WWMCCS were re-evaluated in 1982, the system consisted of 26 types of data processors containing 49 computer configurations with 83 central processing units. The batch-processing system was beginning to groan under the workload, as 1,500 work stations around the world were finding new uses for WWMCCS. The computers were described as technically obsolete and difficult to support in 10 years.

WIS was initiated to address technical obsolescence, mission capability enhancement and the chronic problem of nuclear age command, control and communications survivability.

WIS was specifically charged to: 1) develop a modern ADP system providing command and control information for the NCA; 2) support strategic nuclear and conventional planning and command of forces; 3) provide an effective crisis action management system; 4) support joint execution planning and monitoring; and 5) provide supportability and sustainability information for command and support of forces.

Key elements in the WIS mission requirement were developing an automatic message handling capability, implementing the Joint Operations Planning and Execution System (JOPES) and the National Military Command System Information System (NIS) operational capabilities approved by the Joint Chiefs of Staff, and converting software to Ada programming language. AWIS was the Army portion of the joint WIS program and was to modernize C<sup>2</sup> information processing at eight Army-supported WWMCCS sites. AWIS was also to modernize the automated information processing and exchange needed for strategic command and control within the Army. The Navy was responsible for major WIS sites supporting US-CINCPAC, CINCPACFLT, USCINCLANT, CINCLANTFLT, CINCUSNAVEUR, COMUSKOREA, COMUS-

JAPAN, and CNO. AFWIS was the Air Force portion of WIS and was to be implemented at Air Force WWMCCS sites. This include the purchase and fielding of Local Area Networks, LAN Control Centers/Security Monitors, Automated Message Handlers, and Joint Mission Processing Equipment.

WAM. Since then, however, the Defense Information Systems Agency had taken over from the Air Force the role of WWMCCS program manager, and renamed the WIS as the WWMCCS Automated Data Processing Modernization (WAM). The focus was redirected from a developmental to a commercial off-the-shelf approach, with use made of existing contracts as much as possible. DISA had been directed by the Joint Staff to develop and implement JOPES.

## Program Review

**Background.** During FY87, the Army established a plan to transition Army supported sites from WWMCCS to WIS. It also developed a C<sup>2</sup> comparison plan to identify progress and interface requirements at each site. The Navy, meanwhile, began Block A Local Area Network (LAN) installation at the USCINCPAC site and began site design, transition and installation planning for CINCUSNAVEUR, COMUSJAPAN, COMUSKOREA and CNO. Site design was completed at CINCPACFLT and USCINCLANT/CINCLANTFLT. For the Air Force, the integration contractor (GTE) continued major site integration and installation activities. The company defined common Air Force C<sup>2</sup> interfaces to Joint WIS.

In FY88, the Army prototyped menus and input/output screens for Army commonality, developed USAREUR transportation C<sup>2</sup> software and FORSCOM mobilization subsystem, installed LAN cable plants at FORSCOM test sites, and began site implementation functions. The Navy completed Block A site design for all sites, completed Block A LAN installation at USCINCPAC, and contracted for Navy command/site unique software modernization. The Air Force defined common Air Force interfaces, and installed and integrated hardware at the Operational Test Site. The WIS Joint Program Management Office (JPMO) completed the AMHS Critical Design Review, completed installation of a local area network system (LANS) at the Operational Test Sites, and continued Block B Release 1 design and prototyping.

In FY89, the Army tested and installed USAREUR transportation and FORSCOM mobilization and development/employment execution software, initiated development of common Army strategic C<sup>2</sup> software, and began Block B planning with emphasis on software

transition and mainframe hardware installation. The Navy completed the Phase 1 System Requirement Review, System Design Review, System Software Review, and the Preliminary Design Review. The Air Force completed site planning and design for Air Force sites and started installation of LANs and workstations at Air Force operational sites. The JPMO completed the LAN DT&E, conducted the LAN Integrated Systems Test and Early Operational Assessment, deployed workstations, and conducted Block B Release 1 Preliminary and Critical Design Reviews and the Block B DAB Milestone II review.

Some fundamental changes were made in the WIS effort in March 1989. The Air Force had heretofore been the program manager. Now DISA was handed that responsibility. This change apparently came about because the WIS program tried to do too much. The development of software needed to control the various functions fell far behind schedule, because of both changing requirements and overly ambitious goals. DISA renamed the WIS as the WAM (WWMCCS ADP Modernization) program. The assignment of management of most of the program to DISA aroused controversy (the Air Force still retains control of some portions), especially since this is the largest program that DISA ever managed. Also, there is significant political infighting among the various government agencies involved, especially over funding issues. The JOPES program became the primary focus of WAM as the segment with the highest priority. JOPES software is intended to help theater commanders in developing and carrying out wartime plans.

Honeywell Federal Systems was awarded a five-year US\$164 million contract in August 1989 for worldwide delivery, installation and maintenance of computer

workstations and associated hardware, software and peripherals in support of WAM. Honeywell planned to purchase 10,000 to 80,000 Macintosh 2 computers for use in routing message traffic, keeping track of mission status, and performing other functions. RasterOps announced in October 1989 that it would be supplying up to 80,000 customized 8-bit color graphics boards (to be coupled with Mitsubishi color monitors) for the Honeywell computers. Honeywell was supported by 45+ vendors supplying software and peripherals for WAM.

US Air Force. The USAF began installation of local area networks at two locations and installed 600 workstations at Air Force operational sites in FY90. It also determined site requirements for the joint application software and began upgrade to the present host processors. The Navy completed the Navy WAM Site Unique Software (NWSUS) TEMP and Increment I test plans and began design of Increment II software.

In FY91, the Air Force continued to install LANs and workstations at Air Force operational sites. Scheduled FY92 work included continuing LAN and workstation installation and systems integration, along with planning for data base machine integration at Air Force WWMCCS sites. Any scheduled plans for FY93 and beyond have not been made available, nor have there been any further funding appropriations.

US Navy. In FY91, the Navy completed the design of NWSUS Increment I software for UNCINCPAC, COMUSKOREA, and USCINCLANT followed by development and testing. Designs also continued for NWSUS Increment II software specifications. The technical review of JOPEs versions III and III-1 software was started, as was the design of NWSUS Increment III software for USCINCLANT.

Scheduled Navy work for FY92 included: continuing development and testing of NWSUS Increment I, design of NWSUS Increment III, and technical review of JOPEs version III-1 software; beginning development and testing of NWSUS Increments II and III, installation of NWSUS Increment I, and the technical review of JOPEs versions III-2 and IV; and completing the design and test plan of NWSUS Increment II. FY93 plans focused on completing installation of NWSUS Increments I, II, and III at USCINCPAC, USCINCLANT, and COMUSKOREA, with continued development and testing of Increment III. Details of scheduled activity for FY94 and beyond have not been made available, nor have there been any funding appropriations.

US Army. During FY91 Army scheduled work on AWIS included: fielding strategic C<sup>2</sup> software to lead sites; continued fielding of Forces Command (with

software upgrades) and Mobilization/Operations Deployment Employment Execution; performing version IV and V software development; and Army Software Contract Development of Segment 2 and Operational Test.

Army AWIS accomplishments for FY92 consisted of the following: developing and fielding Core Block software (logistics, mobilization, personnel, and ASORTS [formerly Unit Status]) to the lead sites and export modules to other primary AWIS sites; initiating the maintenance phase of the Core Block software; and beginning a detailed design of Block 1 software modules.

Army activity in FY93 centered on completing the detailed design and validating Block 1 software modules, fielding Core Block software to secondary sites, completing development of Block 1 software primary sites, and fielding Block 1 software modules to primary sites.

However, defense budget reductions and the planned initiation of the Global Command and Control System (GCCS) caused the FY93 level of effort on the AWIS software development to be reduced, which in turn resulted in the delayed fielding of some items and deferred development of others. This included logistics software replacement/upgrade for the current Logistics Network (LOGNET) system, previously scheduled for September 1992, but delayed until March 1993; ASORTS, previously scheduled for August 1992, changed to March 1993; the Logistics Munitions and End Items releases, previously slated for September 1993, reprioritized; and LOGNET Planning, changed to September 1993. These schedule delays also resulted in some cost increases because existing site-unique computer program lines of code had to be maintained and upgraded. The agenda for FY94 concentrated on completing development and fielding of Block 1 software modules to secondary sites, initiating Block 3 software development, and updating previous block software.

US Army Standard Theater Army Command and Control System (STACCS). Project DC49 STACCS was part of PE#0203740A Maneuver Control System. STACCS was the Army component system that directly supported the implementation of GCCS. This support was accomplished through the US Army Global Command and Control System (AGCCS) which is a selection of the Army's best-of-breed command and control functionality. AGCCS-developed software systems dramatically improve the Army's ability to analyze courses of action, develop and manage Army forces supporting joint war plans, and ensure that the Army portions of war plans are feasible.

The Army identified STACCS as the foundation for AGCCS. Using STACCS foundation applications and additional software functionality developed under the Army WWMCCS Information System (AWIS) and the USCINCEUR Command and Control System (UCCS), the AGCCS provides a layered architecture and functional best-of-breed software applications to develop a totally integrated component of GCCS. The AWIS Project Management Office is the Army's focal point for the development and implementation of AGCCS. Specifically, this office develops policies, plans and programs for the integration of Army C<sup>3</sup> systems to ensure compliance with user requirements and interoperability with GCCS.

The initial consolidation of AWIS and STACCS to form the nucleus of the AGCCS project occurred in July 1994. In October 1995, the Combat Service Support System (CSSCS) was reconsolidated into the AGCCS project. The new project office name effective as of the beginning of FY96 is Project Manager for Strategic and Theater Command and Control.

**Note:** For related information, see the report titled "Maneuver Control System" in this volume.

JOPES. On August 7, 1988, GTE was awarded a US\$14.1 million contract from the Air Force Electronic Systems Center for the initial design and development of an integrated planning system for WIS known as the Joint Operational Planning and Execution System (JOPES). The system was scheduled to be deployed as part of WWMCCS early in FY91. Along with providing a consolidated planning function, JOPES allows access to reference files and the Joint Strategic Capabilities Plan, operations planning, the merger of several operations plans, rapid force building and the development of better analysis tools to evaluate the feasibility of force planning, sustainment and deployment.

GTE was awarded a one-year, US\$16.4 million contract in late 1989 for the first stage of JOPES software development. The contract was issued to allow GTE to complete the initial increment of JOPES software, which was started with funds from the WIS effort.

On November 25, 1991, a contract of US\$2.9 million was awarded to Computer Sciences Corporation for an extension to JOPES Increment 1.

The FY90 Congressional cut of US\$10 million resulted in a six-month delay in fielding JOPES Version IV. This cut caused the postponement of efforts to test and

qualify local area and wide area network components. This delayed standard compliance and also caused additional delays in efforts to connect to a relational data base environment. In addition, funds previously identified for development of JOPES were re-allocated to support JOPES software maintenance for FY92-97. During FY92, JOPES Version 4 was fielded and Version 5 tested, and JOPES was slated to be fielded in FY93. However, in late 1992, JOPES, which was supposed to modernize WWMCCS, was terminated as the Joint Staff began pushing the concept of GCCS.

WWMCCS Modernization Efforts. Under the guidance of DISA, the WWMCCS System Engineer program provided overall system analysis, architectural development, and system engineering/integration, and developed mental engineering responsibilities for joint and national level C<sup>3</sup> systems to ensure the affected systems continue to be responsive in current, dynamically changing environments. These activities involved WWMCCS, all MILSATCOM systems, and other joint/national level systems which necessitated a high degree of multi-service/agency planning and development. Included were technical support and engineering integration to facilitate compliance with standards and technical architectures and to improve the command centers of the Unified and Specified Commands. Technical support in the above-mentioned activities was provided to the Office of the Secretary of Defense, the Joint Staff, Unified and Specified Commands (CINCs), the Military Departments and Defense Agencies. Additionally, this program developed planning guidance backed by analysis and data to support the Defense Secretary, the Joint Staff, and CINCs in prioritizing their WWMCCS requirements and acquisitions.

WWMCCS Merged into GCCS. The WWMCCS ADP Modernization follow-on program development was assigned to the Joint Staff to execute the program under the name Global Command and Control System (GCCS), which is a comprehensive, worldwide system of systems that provides the National Command Authority, the Chairman of the Joint Chiefs of Staff, CINCs, Services, Defense Agencies, Joint Task Force commanders and component commanders, and others with information processing and dissemination capabilities necessary to conduct command and control.

End of WWMCCS. On June 30, 1997, DISA and the Joint Chiefs of Staff shutdown WWMCCS and officially turned over all that system's functions and responsibilities to the GCCS.

## Funding

As WWMCCS has been incorporated into and replaced by GCCS, please refer to that report for overall funding figures for both RDT&E and procurement. The US Army WWMCCS segment was predominately funded through the Maneuver Control System program.

## Recent Contracts

No current contracts over \$5 million have been publicly identified.

| <u>Contractor</u> | <u>Award<br/>(\$ millions)</u> | <u>Date/Description</u>                                                                                                                                                                                                                       |
|-------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GTE               | 10.5                           | Mar 1994 – FFP contract for logistics support to provide services, materials and support equipment for remedial maintenance of WWMCCS Common User Contract Equipment. Contract was expected to be completed in March 1999. (F09603-94-D-0380) |

## Timetable

| <u>Month</u> | <u>Year</u> | <u>Major Development</u>                                                                                                                                                                                              |
|--------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dec          | 1981        | Joint Mission Element Need Statement published                                                                                                                                                                        |
|              | FY82        | Report to Congress on WIS modernization                                                                                                                                                                               |
|              | FY83        | Joint Operations Planning & Execution Systems/Required Operational Cap received. Automated Message Handling Required Operational Cap received. WIS Security Prototype. WIS Auto Message Handling Prototype Deployment |
|              | FY84        | Integration contract awarded. AFWIS Program Management Directive                                                                                                                                                      |
| May          | 1985        | Material System Requirement Specifications issued                                                                                                                                                                     |
| Jul          | 1985        | WIS Decision Coordinating Paper                                                                                                                                                                                       |
|              | FY85        | Common User contract award. System Support contract award. Block A Defense Systems Acquisition Review Council I/II. AFWIS Draft Baseline                                                                              |
|              | FY86        | System Engineering & Integration contract award                                                                                                                                                                       |
| Jul          | 1987        | AWIS Test & Evaluation Master Plan                                                                                                                                                                                    |
| Dec          | 1987        | AWIS Program Master Plan                                                                                                                                                                                              |
| Apr          | 1988        | JOPEs Required Operational Capability                                                                                                                                                                                 |
| May          | 1988        | Life Cycle Documents Architecture Design contract                                                                                                                                                                     |
| Mar          | 1989        | WIS terminated and WAM assigned to DISA                                                                                                                                                                               |
| Aug          | 1989        | Honeywell awarded contract for WAM effort                                                                                                                                                                             |
| Nov          | 1989        | Contract awarded to GTE for initial increment of JOPEs software                                                                                                                                                       |
| Mar          | 1991        | Initial portion of JOPEs originally scheduled for deployment                                                                                                                                                          |
| Nov          | 1991        | Contract awarded to Contel for JOPEs Increment 1 extension                                                                                                                                                            |
|              | FY92        | Release of MOB/ODEE for FORSCOM and WWMCCS through CONUS                                                                                                                                                              |
| Jun          | 1992        | GCCS concept introduced                                                                                                                                                                                               |
| Oct          | 1992        | JOPEs terminated                                                                                                                                                                                                      |
| Mar          | 1993        | Army AWIS Test and Evaluation Master Plan. LOGNET and ASORTS released                                                                                                                                                 |
|              | FY93        | Complete installation of NWSUS Increment I, II, and III at USCINCPAC, USCINCLANT, and COMUSKOREA                                                                                                                      |
|              | FY95        | GCCS program startup scheduled                                                                                                                                                                                        |
| Sep          | 1995        | WWMCCS begins integration into GCCS                                                                                                                                                                                   |
|              | 1996        | WWMCCS considered an umbrella program of GCCS which was designated the lead program                                                                                                                                   |
| Jun          | 1997        | WWMCCS deactivated, merged, and replaced by GCCS                                                                                                                                                                      |

Month      Year      Major Development

## Worldwide Distribution

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While this was primarily a **US Department of Defense** effort, WWMCCS was also a worldwide system and there was likely some foreign involvement, primarily in assuring integration of common efforts under the **NATO** umbrella.

## Forecast Rationale

Initially, GCCS was to replace WWMCCS outright; however, it now appears that WWMCCS has become one of the three umbrella systems integrated to form the core components of GCCS. The GCCS concept began in 1992 when the DoD terminated a US\$825 million computer upgrade to WWMCCS because it was not worth the expense. It was then decided that GCCS would replace the existing WWMCCS, which had been in use since the early days of the Cold War, and had often been described as slow and cumbersome by DoD users.

GCCS is designed to track and direct troops globally, and to be operated from several sites including Virginia, Germany, South Korea and Hawaii. It is comprised of three main elements: a set of core software needed by most of the military commanders-in-chief; a set of common technical standards intended to allow easy

upgrade of computer systems and easy exchange of information; and a set of unique software for each of the commanders-in-chief. According to DoD sources, GCCS began replacing WWMCCS as the lead system in September 1995.

While WWMCCS itself no longer exists as a separate entity, its overall framework and function are still active as part of GCCS and will likely require some maintenance and support funding. In one form or another, the basic core design of WWMCCS will be around for the next several years. Any funding or maintenance for the old WWMCCS will likely come under the GCCS program.

**Note:** *For more information, see the report titled "GCCS" in this volume.*

## Ten-Year Outlook

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The forecast chart has been omitted. **BARRING ANY SIGNIFICANT ACTIVITY, THIS REPORT WILL BE ARCHIVED NEXT YEAR, 2000.**

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