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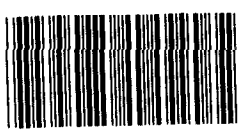
Briefing Report to the Chairman, Subcommittee on Defense, Committee on Appropriations, House of Representatives

April 1991

BATTLEFIELD AUTOMATION

Army Tactical Command and Control System's Schedule and Cost



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National Security and
International Affairs Division

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April 15, 1991

The Honorable John P. Murtha
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

As you requested, we reviewed the Army's efforts to implement the Army Tactical Command and Control System (ATCCS) program. Our specific objective was to provide updated information on the ATCCS program's status and schedule as well as costs. This report updates our February 1990 report[1] on similar ATCCS information.

Background

The ATCCS program is the Army's comprehensive approach to automating its tactical command and control systems and improving its communications systems. This over $17-billion effort is designed to enhance the coordination and control of combat forces through automated management of five key battlefield functional areas: (1) field artillery, (2) tactical intelligence, (3) combat service support, (4) forward area air defense, and (5) maneuver control. ATCCS is comprised of five command and control segments, three communications segments, and one common hardware and software segment to provide computer commonality.

Results in Brief

From October 1989 through December 1990, six of the nine segments that comprise ATCCS have experienced delays in development and production. Also, six of the nine segments will have delays in initial operational capability from 1 to 23 months. Currently, the segments are in various stages of development and acquisition ranging from concept definition to final fielding.

Army estimates show that since 1989 consolidated ATCCS costs decreased from $18.6 billion to $17.1 billion,[2] a decrease of $1.5 billion. This change includes a decrease of $2.8 billion for one of the nine segments offset by increases of $1.3 billion for six other segments. The large cost

[1]Battlefield Automation: Army Tactical Command and Control System's Cost and Schedule (GAO/NSIAD-90-28BR, Feb. 8, 1990).

[2]These totals exclude the intelligence electronic warfare system—All Source Analysis System—acquisition cost estimates. This information is provided in a separate classified report.

decrease for the Single Channel Ground and Airborne Radio System resulted from reduced equipment quantities and uncertain plans for out-year buys. Cost increases associated with six other segments were the result of revised software cost estimates, hardware and software improvements, and schedule delays.

We have concerns about three ATCCS segments: the All Source Analysis System, the Maneuver Control System, and the Common Hardware and Software. Details of our concerns, which relate to development, testing, and requirements, will be discussed in a follow-on report.

Scope and Methodology

To determine the ATCCS program's progress and status, we reviewed acquisition plans, cost estimates, schedules, test plans, and other pertinent documents. We discussed estimated costs, schedule, and performance for each segment of the program with officials at the

- ATCCS program offices in Huntsville, Alabama; McLean and Fort Belvoir, Virginia; and Fort Monmouth, New Jersey;
- Office of the Secretary of Defense for Command, Control, Communications and Intelligence; Army Office of Deputy Chief of Staff for Operations; and Director, Information System Command, Control, Communications, and Computers in Washington, D.C.;
- Army test and evaluation agencies in Aberdeen, Maryland; Fort Monmouth, New Jersey; Falls Church, Virginia; and Washington, D.C.;
- Combined Arms Center, Fort Leavenworth, Kansas; and
- ATCCS development contractor offices in Leavenworth, Kansas, and El Segundo, California.

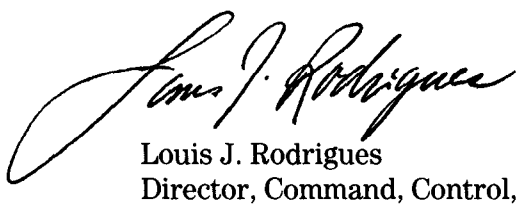
We performed our review from February 1990 to February 1991 in accordance with generally accepted government auditing standards.

We did not obtain written agency comments. However, we discussed a draft of this report with Department of Defense and Army officials and have included their comments as appropriate. Appendix I provides an overview of the ATCCS program's schedule and cost, and appendix II contains additional details on the various segments that comprise ATCCS.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days from the date of this letter. At that time, we will send copies to interested parties and make copies available to others on request.

Please contact me on 275-4841 if you or your staff have any questions concerning the report. The major contributors to this report are listed in appendix III.

Sincerely yours,



Louis J. Rodrigues
Director, Command, Control, Communications,
and Intelligence Issues

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Abbreviations

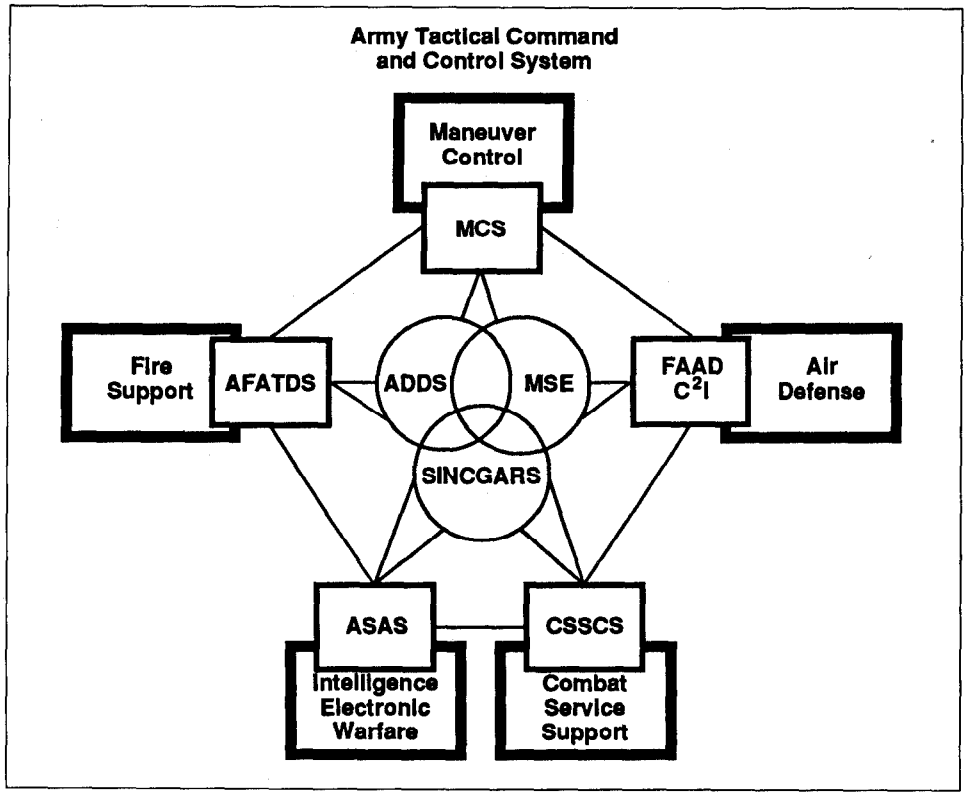
ADDS	Army Data Distribution System
AFATDS	Advanced Field Artillery Tactical Data System
ASAS	All Source Analysis System
ATCCS	Army Tactical Command and Control System
CHS	Common Hardware and Software
CSSCS	Combat Service Support Control System
EPLRS	Enhanced Position Location Reporting System
FAAD C2I	Forward Area Air Defense Command, Control, and Intelligence
GAO	General Accounting Office
JTIDS	Joint Tactical Information Distribution System
MCS	Maneuver Control System
MSE	Mobile Subscriber Equipment
SINCGARS	Single Channel Ground and Airborne Radio System

Overview of the Army Tactical Command and Control System's (ATCCS) Program Schedule and Cost Changes

ATCCS, one of the Army's highest priorities, is intended to enhance the Army's warfighting capabilities by automating its command and control and improving its communications capabilities. When ATCCS is fielded in the 1990s, the Army estimates that it will have spent over $17 billion for an integrated network of computers, radios, and other equipment. ATCCS is intended to help battlefield commanders, from the corps down to the battalion, manage and control their resources more effectively.

ATCCS consists of five major command and control segments: (1) Advanced Field Artillery Tactical Data System (AFATDS); (2) All Source Analysis System (ASAS); (3) Combat Service Support Control System (CSSCS); (4) Forward Area Air Defense Command, Control, and Intelligence (FAAD C2I); and (5) Maneuver Control System (MCS). These segments will be linked together by three communications segments: (1) the Army Data Distribution System (ADDS) which has two parts, the Enhanced Position Location Reporting System (EPLRS) and the Joint Tactical Information System (JTIDS); (2) the Mobile Subscriber Equipment (MSE); and (3) the Single Channel Ground and Airborne Radio System (SINCGARS). (See fig. I.1.)

Figure I.1: ATCCS Architecture and Battlefield Functional Areas



Source: U.S. Army

The Common Hardware and Software (CHS) segment will initially provide the computers for four of the five major command and control segments.[1] The goal for CHS is to reverse the proliferation of unique computer systems and enhance interoperability between the command and control segments.

Prior to the establishment of the ATCCS program in the mid-1980s, the segments that comprise ATCCS were initiated as independent development projects. Currently, the segments are in various stages of development and acquisition ranging from concept definition to final fielding. Table I.1 presents a snapshot of each segment's current phase and the next major event in its acquisition cycle.

[1]In 1986, the Army exempted the All Source Analysis System from the CHS acquisition because of its security requirements and advanced stage of development using a programming language that is different from the one ATCCS uses.

Table I.1: ATCCS Program Status as of December 1990

Segments	Current phase	Next major test/event	Scheduled date
Command and control			
AFATDS	Full-scale development	Developmental test	6/93
ASAS	Limited production	Operational test	7/92
CSSCS	Full-scale development	Operational test	2/93
FAAD C2I	Concept definition	Software demonstration	5/91
MCS (Non-CHS)	Fielding	None	
MCS (CHS)	Concept definition	Operational test	4/92
CHS	Production	Lightweight computer contract award	4/91
Communications			
ADDS-EPLRS	Limited production	System demonstration	5/91
ADDS-JTIDS	Full-scale development	Technical test	10/91
MSE	Fielding	None	
SINCGARS	Limited production	Defense Acquisition Board review	12/91

Schedule Changes

From October 1989 through December 1990, ATCCS schedules have slipped for the five major command and control segments and the two ADDS components. The delays were caused by (1) software development and reliability problems, (2) contract delays, (3) program restructuring, and (4) internal funding cuts. Mobile Subscriber Equipment and CHS segments continued to remain on schedule.

Table I.2 shows changes in major milestones of the current ATCCS acquisition schedules from October 1989 through December 1990. The selected milestones are full-rate production and initial operational capability. Table I.2 also shows the primary factors contributing to the changes. The Army is reorienting its ATCCS development strategy in light of force structure reductions in response to changes in the world situation and program difficulties. The reorientation is to accelerate ATCCS fielding by providing less capable command and control systems to light divisions in the near term and more capable equipment to heavy divisions in the future. These actions would defer providing a capability to the majority of the planned active Army force structure for several years.

Table I.2: Changes in ATCCS Acquisition Schedules From October 1989 Through December 1990

	Full-rate production			Initial operational capability			
Program	10/89	12/90	Change (months)	10/89	12/90	Change (months)	Army explanation
Command and control							
AFATDS	5/93	4/94	11	3/94	1/95	10	Contract award delay
ASAS	1/92	2/93[a]	13	7/95[b]	9/95[b]	2	Additional testing required
CSSCS	9/93	9/93	0	9/93	10/93	1	Administrative preparations
FAAD C2I	5/93	9/93[c]	4	7/93[b]	9/93[b/c]	2	Program restructure
MCS (CHS)	5/92	8/92	3	11/91	6/92[b]	7	Funding cuts
CHS	8/88[a]	8/88[a]	0	6/89[d]	6/89[d]	0	On schedule
Communications							
ADDS-EPLRS	3/93	9/94	18	6/92	5/94	23	Late contract award, program restructuring, additional testing
ADDS-JTIDS	10/91	10/95	48	4/93[b]	8/93[b/e]	4	Additional testing required, Army funding cuts
MSE	12/85	12/85	0	5/88	5/88	0	On schedule
SINCGARS	9/90	12/90	3	12/90	12/90	0	Awaiting test results

[a]Full-rate production equates to production contract award.

[b]First unit equipped date is used instead of initial operational capability date.

[c]Because of slips in component sensors and communication devices, the Army has changed its acquisition strategy and decided to first field a less capable system to light divisions. A fully capable system will not be fielded to heavy divisions until October 1997.

[d]Initial operational capability date equates to initial hardware delivery date since CHS is not a system.

[e]Initial fielding with engineering development model units.

Changes in Cost Estimates

The Army's ATCCS cost estimate as of December 31, 1990, was over $17 billion,[2] $6.3 billion for four of the five command and control segments and $10.8 billion for the three communications segments. (The CHS cost is included in the command and control segments' costs.) This represents a decrease of $1.5 billion from the Army's October 1989 estimate. As shown in table I.3, estimated costs increased in all segments except the Single Channel Ground and Airborne Radio System due to revised software estimates, higher hardware unit costs, revised escalation indexes, and program stretch-out. The radio system costs decreased because lower quantity requirements and buys beyond fiscal year 1997 are currently not estimated. (Appendix II contains the costs of each system.)

[2]This estimate does not include the All Source Analysis System costs, which are presented in a separate classified report.

Table I.3: Changes in ATCCS Acquisition Cost Estimates From October 1989 Through December 1990

Dollars in millions

Segment	October 1989	December 1990	Increase (decrease)	Army explanation
Command and control[a]				
AFATDS	$870.6	$1,052.1	$181.5	Revised software estimate, CHS hardware upgrade, common ATCCS expenses
ASAS	•	•	•	
CSSCS	276.1	436.2	160.1	CHS hardware upgrade, schedule stretch-out
FAAD C2I	3,170.9	3,361.8	190.9	Program restructure, added quantities, revised ground sensor requirement
MCS	1,272.1	1,436.8	164.7	CHS hardware upgrade, program stretch-out
Subtotal	**$5,589.7**	**$6,286.9[c]**	**$692.2[b]**	
Communications				
ADDS	$2,828.8	$3,158.0	$329.2	Revised escalation indexes, schedule stretch-out for added testing
MSE	4,366.5	4,602.7	236.2	Upgrade security devices
SINCGARS	5,831.6	3,080.1	(2,751.5)	Reduced quantities, no estimate for 106,000 units
Subtotal	**$13,026.9**	**$10,840.8**	**($2,186.1)**	
Total	**$18,616.6**	**$17,127.7**	**($1,488.9)[b]**	

[a]CHS costs are included in the command and control segment's cost estimates.

[b]These totals exclude All Source Analysis System acquisition cost estimate. Details on the system's cost estimates are presented in a separate classified report.

[c]These figures do not reflect a change in the Army force structure. In early 1991, it is expected that the Army will announce its force structure reductions with resultant impacts on program acquisition quantities and costs.

ATCCS Program Profiles

Most of the nine segments comprising ATCCS have experienced one or more of the following problems: (1) funding cuts, (2) technical problems, and (3) hardware upgrades. These program difficulties have extended fielding schedules and increased costs.

Advanced Field Artillery Tactical Data System

The system is being developed as the Army's new automated fire support command and control system. It is intended to automate fire support functions from corps down to the field artillery forward observers. It will also provide automated support to other fire support assets, including tactical air, naval gunfire, mortars, attack helicopters, air defense segments, and tanks. It will replace the outdated Tactical Fire Direction System.

Schedule and Status

The program has incurred a 10-month schedule slippage in initial operational capability due primarily to the need to complete acquisition reviews and delays in awarding the full-scale development contract. Until the Department of Defense reviewed the program, the Army could not spend additional funds for development. The Army planned to award a contract in September 1989 to upgrade and transfer the software to CHS. However, negotiations started later than originally planned and it was not until April 1990 when a 3-year, $60.5-million, full-scale development contract was awarded to Magnavox. The Army now plans to make its full-rate production decision in April 1994 and to achieve initial operational capability in January 1995.

Costs

Table II.1 shows the changes in the Army's cost estimates for the program. Program costs to acquire 3,189 computers for active and reserve units increased because the Army decided to standardize the CHS computers on a single configuration that has more memory and processing capabilities than previously planned. Program costs also increased as a result of contract negotiations for software development and common ATCCS software expenses. As part of the CHS program, the Army is developing software modules (for example, to record data management) that will be used by more than one ATCCS segment. The segment's cost increase reflects its prorated share of these ATCCS expenses.

Table II.1: Changes in the Advance Field Artillery Tactical Data System Program's Acquisition Cost Estimates From October 1989 Through December 1990

Dollars in millions

October 1989	December 1990	Increase
$870.6	$1,052.1	$181.5

All Source Analysis System

The system is the Army's portion of the former Joint Tactical Fusion Program, a joint Army and Air Force program to automate the correlation and analysis of high-volume, time-sensitive intelligence data. It is intended to automate the fusion of intelligence and combat information on the types of enemy units, as well as process information on their locations, movements, projected capabilities, and intentions. It is also intended to automate data analysis and provide a coherent picture of the enemy situation and disseminate this information to commanders so they can make timely, well-informed decisions.

Schedule and Status

The acquisition strategy delays fielding a fully capable system to active forces while retaining early fielding of a limited capability system. In January 1990, the Army Chief of Staff directed that the program be accelerated to field the entire force by 1996. Full system capability is to be achieved through an evolutionary development program and software refinements based on direct user feedback. The full capability system production decision is scheduled for February 1993, with the first units scheduled for delivery in September 1995. These October 1990 revisions mean that the Army plans to field the system over 5 years later than its original plan.

In March 1990, the Army, under a limited procurement (urgent) designation, continued limited production by awarding a contract for the limited capability system for Europe. For fiscal year 1990, the contract was valued at $70 million, with 2 additional option years that have not been priced.

In late 1989, the limited capability system was tested at Fort Hood, Texas. In July 1990, the independent assessment report cited the system's potential intelligence collection capabilities. However, the report also noted that the software was not sufficiently mature to provide a baseline from which to measure its performance in the 1992 operational test. A performance baseline is needed to guide future development, acquisition, and fielding decisions. The report disclosed

other major software problems, including incomplete graphics, inconsistent data base queries, message processing problems, and inaccurate sensor data. These and other problems will be discussed in a follow-on report.

Costs

According to Army officials, the program's cost estimate is considered classified. A separate classified report discusses these costs.

Combat Service Support Control System

The system is to automate the collection, analysis, and dissemination of logistical, medical, financial, and personnel information to theater, force level, and combat services support commanders.

Schedule and Status

The system's concept development phase was completed in December 1990 with the approval of the program to enter full-scale development. The Army extended the decision milestone from September to December 1990 to allow additional time to prepare supporting test and cost documents. A full-scale development contract award was scheduled for February 1991. The system will start technical testing in August 1992 and operational testing in February 1993. The full-rate production decision is scheduled for September 1993. The initial operational capability date has slipped 1 month to October 1993 to provide more time to finalize operational test results.

Costs

Table II.2 shows the changes in the Army's cost estimate for the program. The Army plans to field 1,370 computers to active and reserve components through fiscal year 2008, 159 less than estimated in October 1989. This reduction is due to a lower system maintenance float requirement that resulted from the Army's decision to standardize on a single configuration based on the transportable system. (A detailed discussion of the standard configuration is presented in the CHS section of this appendix.) Program costs have increased because the Army decided to procure a system with more processing speed and memory than originally planned. As a result, the unit cost increased from $36,000 to $78,000. The cost increase also reflects new estimated costs for additional program years in order to remain within existing procurement funding levels.

Table II.2: Changes in the Combat Service Support Control System Program's Acquisition Cost Estimates From October 1989 Through December 1990

Dollars in millions

October 1989	December 1990	Increase
$276.1	$436.2	$160.1

Forward Area Air Defense Command, Control, and Intelligence

The system is being developed to automate command and control of short-range air defense weapons. It is being designed to detect, identify, process, and instantly disseminate information on enemy and friendly aircraft to forward area air defense units. It has four major components: the automated command and control computer, the ground-based sensor, an aerial sensor called the masked target sensor, and an aircraft identification element.

Schedule and Status

In May 1990, the Army restructured the acquisition program due to cost overruns for software development, delays in the component sensors and communications devices, and subsequent Department of Defense funding reductions. Under the restructured acquisition schedule, the Army will start fielding a reduced capability system to light divisions starting in September 1993, and a full capability system to heavy divisions starting in October 1997. The reduced capability system will be deployed with interim sensor and communications devices. As a result, the fully capable system's initial operational capability will occur in October 1997, 2 months later than the Army planned in October 1989.

Under the restructured schedule, the Army plans to make its production decision for the light divisions' reduced capability system in September 1993. First unit equipped will be achieved at the same time using low-rate initial production units. These milestones have slipped by 4 months and 2 months, respectively, since the October 1989 report on the Army's plan for an automated air defense capability. However, the milestones for the full capability system have been extended by more than 4 years due to the unavailability of the Enhanced Position Location Reporting System and the ground-based sensor.

Costs

Table II.3 shows the changes in the Army's cost estimates for the air defense program. Program costs to acquire the system increased due to (1) the additional hardware and software development associated with the restructure, (2) an increase in the number of units to be fielded, and (3) a revised solicitation and increased quantities for the ground-based

sensor. Cost estimates decreased in the aircraft identification component because the programs have been restructured over a shorter period of time. Also, validating the masked target sensor's cost estimate resulted in a lower program cost.

Table II.3: Changes in the Forward Area Air Defense Command, Control, and Intelligence Program's Acquisition Cost Estimates From October 1989 Through December 1990

Dollars in millions

October 1989	December 1990	Increase
$3,170.9	$3,361.8	$190.9

Maneuver Control System

Currently, the system is composed of two types of non-CHS computers: a militarized version and a nondevelopmental item.[1] It is an automated system designed to help maneuver commanders and their battle staff at the corps-to-battalion level control combat forces. It enables the command staffs to collect, store, process, display, and disseminate critical battlefield information and to produce and communicate battle plans, orders, and enemy and friendly situation reports. Extending automation to echelons below the battalion level is being studied.

Schedule and Status

The full introduction of the system using CHS computers will begin in June 1992 or 7 months later than the November 1991 date shown as of October 1989. By then, software changes in the operating system, revised graphics and mapping capabilities, and new force level control applications are to be incorporated into the system. The acquisition of CHS computers is expected to be completed by 2002.

Maneuver Control System Non-CHS Equipment Issues

The latest operational test completed in May 1990 questioned the system's functionality and effectiveness because the system could not produce timely, accurate, and useful information in a battle environment. After a 3-year delay due to technical, software, and performance problems, exceptions were granted to allow the full fielding of the nondevelopmental computers. The Army's Operational Test and Evaluation Agency recommended fully fielding the system, although significant problems exist with the equipment.

[1] A nondevelopmental item is any item that is (1) commercially available, (2) in use by a U.S. agency or foreign government with which the United States has a mutual defense cooperation agreement, or (3) any of the items in (1) or (2) that require only minor modification. Militarized hardware has been specifically designed and custom built for military use to operate under adverse conditions.

The militarized computer version which had been partially fielded prior to the May 1990 test is to be withdrawn due to limitations of its unique operating system, the inability to implement the CHS operating system, limited mapping capability, and inadequate memory capacity. The Army believes that the nondevelopmental computers will be adequate for heavy divisions until CHS equipment and improved software are introduced; however, due to bulky size and excessive weight, the system was found to be unacceptable for light divisions. In April 1990, the Army Vice Chief of Staff directed that a light division system be developed within 18 months.

Costs

Table II.4 shows the changes in the Army's cost estimates for the program. The Army plans to field 4,567 CHS computers to active and reserve units. Program costs have increased because the Army decided to procure a larger system with more processing speed and memory than originally planned. Costs also increased because final procurements will be stretched-out from 1999 to 2002 in order to stay within procurement funding levels.

Table II.4: Changes in the Maneuver Control System Program's Acquisition Cost Estimates From October 1989 Through December 1990

Dollars in millions

October 1989	December 1990	Increase
$1,272.1	$1,436.8	$164.7

Common Hardware and Software

The CHS goals are to simplify the Army's logistics, maintenance, support, and training burden and to lower the cost for fielding an integrated set of automated battlefield command and control systems. The Army believes that a single standard configuration of CHS will improve mission effectiveness by (1) reducing spare parts requirements, (2) enhancing continuity of operations, and (3) reducing the need for operations and maintenance cross training.

When the CHS contract was awarded in August 1988, it provided for three types of computers and peripheral equipment. This included a portable computer unit, a larger transportable computer unit, and a hand-held computer unit. The units were to have a variety of processing and memory capacities, as well as commercial and ruggedized versions. The Army has decided it will primarily buy transportable computers. The transportable unit will be faster with almost double the present main memory and four times the secondary storage capacity. The Army

will also retain the hand-held unit, which has had its memory capacity doubled and its weight reduced from 9.5 pounds to 8.2 pounds. A small lightweight computer is to be added to the CHS product line.

Schedule and Status

Since the August 1988 contract award, the Army has ordered $85.7 million of CHS equipment and related services. Final orders against the current CHS contract will be placed by August 1993. The Army expects to award a follow-on CHS contract in January 1993. The Army also plans to acquire a lightweight computer unit as part of its CHS product line. The lighter unit is expected to meet users', such as light divisions, requirements for a lighter, less bulky unit. The Army plans on ordering 21,100 units over a 5-year period.

Radio and Computer Interfacing Deficiency

The Army accepted the CHS Adaptive Programmable Interface Unit as the device through which ATCCS command and control segments' computers interchange data. Acceptance testing of the unit disclosed that the segments could not interchange data. The CHS contract did not require the contractor to provide all the software that facilitates the communications interchange between the ATCCS command and control segments' computers. The Army is now developing software that will allow the protocols used by a command and control segment's computers to interchange data between the different segments. There had been development problems with the initial phase of this software; however, in November 1990, the developer solved these problems. By the end of 1991, the Army plans to have the unit working with all ATCCS command and control segments. Other problems with CHS will be discussed in a follow-on report.

Costs

Table II.5 shows the changes in the Army's cost estimate for the CHS program. The Army plans to acquire 14,136 computers for the five ATCCS command and control segments. Acquisition costs increased because the Army decided to procure a more costly configuration and slightly increased the quantity to be acquired. Although CHS procurement funds are identified below, actual procurement funds come from and are included in the individual command and control programs already discussed.

Table II.5: Changes in the CHS Program's Acquisition Cost Estimates From October 1989 Through December 1990

Dollars in millions

October 1989	December 1990	Increase
$700.0	$1,366.0	$666.0

Army Data Distribution System

The Army Data Distribution System is comprised of two systems, the Enhanced Position Location Reporting System and the Joint Tactical Information Distribution System. The enhanced location system is an Army-led program to provide a low- and medium-rate data communications capability for users at division level and below, such as artillery and forward area air defense units. The joint information system, an Air Force-led program, is being developed for high-rate data users, such as intelligence and long-range defense units in corps and divisions.

Enhanced Position Location Reporting System Schedule and Status

The Army has extended system testing to ensure that problems identified during early technical testing are resolved and to improve system performance. The Army awarded a low-rate initial production contract in January 1990. The first of three options was awarded in July 1990, after the system successfully completed a production system verification test.

The initial operational capability date for the system is scheduled for May 1994, 23 months later than the 1989 estimate, and a full-rate production decision is scheduled for September 1994, 18 months later than the Army estimated in 1989. These delays were caused by (1) late award of the low-rate initial production contract, because the Office of the Secretary of Defense withheld funds until January 1990, (2) additional planned testing to verify improved system performance, and (3) funding decreases.

Joint Tactical Information Distribution System Schedule and Status

The system is undergoing technical testing that will end in January 1991. A system test of its components has been scheduled to start in October 1991. The start of operational testing has slipped from March 1991 to January 1993 due to the test community's decision to test the Enhanced Position Location Reporting System with air defense host systems.

As a result of reduced Army funding for fiscal year 1992, the system has been restructured to include a November 1992 limited-rate production milestone. The full-rate production decision was deferred to October 1995, 48 months later than the Army estimated in 1989. This was due primarily to reduced funding and the need for integrated testing with the air defense control system. Initial operational capability will be achieved with engineering development units in August 1993.

Costs

Table II.6 shows the changes in the Army's cost estimates for the Army Data Distribution System programs. The Army plans to acquire equipment for 15 divisions and 4 corps through fiscal year 2008. Program costs have increased due to revised inflation indexes and schedule stretch-out caused by reduced funding and additional technical testing.

Table II.6: Changes in the Army Data Distribution System Program's Acquisition Cost Estimates From October 1989 Through December 1990

Dollars in millions

October 1989	December 1990	Increase
$2,828.8	$3,158.0	$329.2

Mobile Subscriber Equipment

Mobile Subscriber Equipment is being acquired to provide area-wide telephone-like communications to mobile and stationary users, including voice, data, and facsimile capability for corps and divisions. Consisting of radio telephones, switches, generators, trucks, and automated control centers, Mobile Subscriber Equipment is designed to interoperate with the Tri-Service Joint Tactical Communications System, combat net radios, commercial telephone systems, and allied communications networks. The system is more mobile, less labor-intensive, and more survivable than existing area communications systems.

Schedule and Status

The system's final contract option was awarded in March 1990. Fielding started in May 1988 and will be completed by December 1993. Operational tests in 1988 disclosed that the desired grade of service/call completion rate was not achieved. Faced with the potential withholding of $1.5 billion in additional payments, the prime contractor agreed to improve the system's performance by February 1991. Recent tests show that it met the 90-percent grade-of-service requirement.

Costs

Table II.7 shows the changes in the Army's cost estimates for the program. The Army has acquired equipment to support 2 training bases, 26 divisions, and 20 corps battalions, including reserve units. The Army purchased the quantities it needed for a revised force structure and canceled its fiscal year 1991 buy.

Table II.7: Changes in the Mobile Subscriber Equipment Program's Acquisition Cost Estimates From October 1989 Through December 1990

Dollars in millions

October 1989	December 1990	Increase
$4,366.5	$4,602.7	$236.2

Single Channel Ground and Airborne Radio System

The system will be used by all services and is to provide the Army with a new generation of lightweight, jam-resistent, secure, very-high frequency combat net radios. It is being produced in ground and airborne versions and is to be the primary means of command and control for infantry, armor, aviation, and artillery units down to the platoon level. In the mid-1980s, ITT Corporation was awarded initial contracts for the ground and airborne radios. In 1988, the Army awarded General Dynamics Corporation a production contract for additional ground radios.

Schedule and Status

The June 1990 initial operational test found the ITT ground and airborne radios to be operationally effective and suitable. The U.S. Army Operational Test and Evaluation Agency did note that the ground radio failed the criterion for passing digital data communications in a hostile electronic warfare environment. An October 1990 operational experiment verified the radio's capability to work in an electronic warfare environment. Due to the need for follow-on testing to resolve problems identified during the initial operational test, the Defense Acquisition Board's review was delayed from September 1990 to December 1990. In December 1990, the Board approved the full-rate production for the ITT radios and limited production for the General Dynamics radios.

The Army's July 1990 independent operational assessment concluded that the General Dynamics radios have the potential to be operationally effective and suitable and should proceed to the next phase. The follow-on operational test of the General Dynamics radios has slipped from March 1991 to July 1991, causing the Defense Acquisition Board's full-rate production decision for the radio to slip to December 1991.

Costs

Table II.8 shows the changes in the Army's cost estimates for the program. Program costs have decreased due to reduced quantity requirements resulting from anticipated force structure reductions and an unfunded requirement. In October 1989, the Army planned to field 351,000 ground radios and 14,000 airborne radios by fiscal year 2004. The Army has proposed reducing this requirement to 246,000 ground radios and 10,000 airborne radios. The Army now expects to spend $3.1 billion to field 141,500 ground radios and 8,500 airborne radios by fiscal year 1998. The Army's plan for acquiring the remaining 106,000 radios is uncertain. However, it is a key factor in the program's lower cost estimate because the type and cost of the 106,000 radios has yet to be determined.

Table II.8: Changes in the Single Channel Ground and Airborne Radio System Program's Acquisition Cost Estimates From October 1989 Through December 1990

Dollars in millions

October 1989	December 1990	(Decrease)
$5,831.6	$3,080.1	($2,751.5)

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