GAO

Fact Sheet for Congressional Requesters

May 1986

TACTICAL COMPUTERS

Army's Maneuver Control System Procurement and Distribution Plan

GAO/IMTEC-86-21FS

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

INFORMATION MANAGEMENT
& TECHNOLOGY DIVISION

B-223144

May 23, 1986

The Honorable Bill Chappel, Jr.
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

The Honorable Ted Stevens
Chairman, Subcommittee on Defense
Committee on Appropriations
United States Senate

In response to your requests, we are providing information on the Army's computer equipment procurement and distribution plan for the Maneuver Control System. This system is intended to help battlefield commanders manage their resources, including weapons and personnel. We examined the Army's plan to determine whether it complied with congressional guidance and provided a sound and economical means to meet the Army's operational and functional requirements for the system. A briefing report containing our findings and conclusions concerning the Army's plan will be provided as soon as possible.

In March 1986, in response to Defense Appropriations Conference Report 99-450, dated December 19, 1985, the Army submitted a report detailing its computer equipment procurement and distribution plan for the Maneuver Control System. The plan proposed the expenditure of $223.6 million during fiscal years 1986 through 1988 to complete the acquisition of computer equipment needed to field the system for U.S. active forces.

We observed that the Army plan

--deletes the Army's previous plans to acquire militarized Tactical Computer Systems and does not provide any computer equipment to battalion units (placing computer equipment at the battalion level was assessed by the Army to be a major portion (54 percent) of the completed system's total automation);

--contains overstated costs for ruggedized[1] commercial computer equipment (the Army has unofficially provided GAO with revised cost estimates for this equipment totaling over $47 million less than its plan);

--differs with other Army documents concerning the quantities of militarized equipment required;

--is inconsistent with Army analysis concerning the need for militarized equipment at corps and division echelons;

--includes as rapidly deploying forces all active forces that would be deployed to the European, Korean, and Southwestern Asian Theaters (17 divisions), as opposed to the 11 divisions assumed by congressional guidance;

--provides for the investment in technically limited militarized computer equipment that may meet requirements for only 1 to 2 years;

--does not provide a formal operational test for the Maneuver Control System prior to computer equipment production commitments; and

--does not complete computer equipment procurements until fiscal year 1988 (the congressional target was fiscal year 1987).

The enclosed fact sheet provides detailed information on the status of the Maneuver Control System program, the Army's computer equipment procurement and distribution plan for this system, and the plan's compliance with congressional guidance.

In performing our review, we analyzed pertinent contracts and other documents identifying the system requirements, costs,

[1]Ruggedized means that equipment has been adapted to enhance its capabilities. Ruggedized equipment is often less tolerant of adverse operating conditions than equipment that has been specifically designed for military use (commonly called militarized equipment).

development plans, and testing approach. In addition, we received briefings from and interviewed Army officials responsible for the direction and support of the Maneuver Control System program. These included officials at the United States Combined Arms Center Development Activity, who are responsible for defining user requirements, and officials at the Fort Leavenworth, Kansas, Army center, which supports software development for the Maneuver Control System.

We discussed system development and acquisition strategies with officials from the Maneuver Control System project manager's office, United States Army Communications and Electronics Command, Fort Monmouth, New Jersey, and the system's integration contractor. Also, we contacted Army headquarters officials responsible for oversight of the Maneuver Control System program and for force deployment planning.

As requested, we did not obtain agency comments on a draft of this document. However, we have discussed the facts in this report with Army officials and have incorporated their comments where appropriate. We are providing copies of this report to interested parties and will make copies available to others on request.

Should you need additional information or have any questions on the contents of this document, please call me at 275-4649.

Carl R. Palmer
Associate Director

Contents

ABBREVIATIONS

AC	Analyst Console
ACCS	Army Command and Control Systems
BMD	Bubble Memory Device
MCS	Maneuver Control System
MIL	Militarized
NDI	Nondevelopmental Item
RDT&E	Research, Development, Test and Evaluation
TCP	Tactical Computer Processor
TCS	Tactical Computer System
TCT	Tactical Computer Terminal

INTRODUCTION

The Army has been trying for over 25 years to automate tactical command and control operations. One such effort is the Maneuver Control System (MCS) program. This program is intended to provide automated battlefield information for commanders and their staffs at corps, division, brigade, and battalion echelons. Originally, the MCS was to be a system supported totally with militarized computer equipment. However, the Army now plans to field the MCS with a mix of militarized and nondevelopmental item (NDI) commercial computer equipment. The commercial computer equipment would be packaged (ruggedized) so as to improve its ability to operate in a stressful environment.

Congress is concerned about the high cost of the MCS program and, in Defense Appropriations Conference Report 99-450, dated December 19, 1985 (appendix I), directed the Army to provide a revised MCS computer equipment procurement and distribution plan. In March 1986, the Assistant Secretary of the Army (Research, Development and Acquisition) submitted a report (appendix II) detailing the Army's computer equipment procurement and distribution plan for the MCS.

ISSUES

The Army's plan contains overstated costs of over $47 million for NDI computer equipment and provides for the completion of the NDI computer equipment acquisition in fiscal year 1988. Congressional guidance specified that procurements should be completed by fiscal year 1987 (see appendix I). The Army's plan also provides for the investment in technically limited militarized computer equipment that may meet requirements for only 1 to 2 years. In addition, the Army's plan disagrees with other Army documents and analysis concerning the required quantities of militarized computer equipment. The net change in program cost for revised militarized computer equipment quantities is a reduction of up to $2.6 million.

The requirement for militarized computer equipment at corps and division echelons

A key issue is whether it is feasible to eliminate the militarized computer equipment to be deployed at corps and division echelons. If feasible, such a reduction in militarized computer equipment would provide an estimated program cost reduction of $27 million. Recent Army analysis concerning the hardness requirements for electronic equipment at corps and division echelons indicates that ruggedized NDI commercial computer equipment would meet the requirements for these echelons. However, proponents for the MCS indicate that militarized computer equipment is needed at all echelons because of the criticality of the functions to be supported and concerns about

the effects of tracked vehicle vibration and nuclear explosions on equipment operation.

If the Army's requirements can be met without militarized computer equipment at the corps and division echelons, an estimated total program cost reduction of over $76 million, including cost adjustments for revised NDI computer equipment costs and militarized computer equipment quantities, would be possible.

Number of active divisions that should receive militarized computer equipment

A second important issue is the number of active divisions that should receive militarized computer equipment. The Army's plan proposes that the training base, corps, separate brigades, air cavalry regiments and 17 active divisions receive a mix of militarized and ruggedized NDI commercial computer equipment, while a single division (the 6th infantry division) would receive only ruggedized NDI commercial computer equipment. The congressional guidance assumed the fielding of 11 active divisions with a mix of militarized and ruggedized NDI commercial computer equipment, and the fielding of 7 active divisions with only ruggedized NDI commercial equipment. (We have not evaluated the Army's need to equip 17 rather than 11 active divisions with militarized computer equipment.) However the cost impact of various fielding strategies is shown below.

If only 11 divisions are fielded with a mix of militarized and ruggedized NDI commercial computer equipment, an estimated $23.9 million reduction in program cost would be possible. When this reduction is combined with cost adjustments for revised NDI computer equipment costs and revised quantities of militarized computer equipment, the estimated total reduction in program cost would be over $73 million.

If the training base, separate brigades, air cavalry regiments and the brigades of only 11 divisions are fielded with a mix of computer equipment, and if militarized computer equipment can be eliminated at the corps and division echelons, we estimate that militarized computer equipment costs would be reduced by over $43 million providing an estimated total program cost reduction of over $92 million.

Need for formal operational testing prior to production

A third key issue involves the need for formal operational testing of MCS computer equipment and software prior to production commitments for computer equipment. Under the Army's current plan, production commitments would be made before formal operational testing was performed. Department of Defense and Army

regulations and guidance (Defense Acquisition Circular Number 76-43, Department of Defense Directive Number 5000.3, and Army Regulation 70-1) direct that a complete prototype system, including software, be built to production specifications and subjected to final developmental and operational testing prior to making production commitments.

MCS PROGRAM STATUS

Key MCS Events

1980 With the termination of the Tactical Operation System program, the Tactical Computer System (TCS) and the Tactical Computer Terminal (TCT) were selected as the equipment to support MCS.

1983 The Army approved the MCS for production but required major system changes:

- --upgrade the TCS (communications module) and TCT (from a 8-bit to a 16-bit processor);
- --develop MCS software using the Ada programming language;
- --procure ruggedized NDI commercial computer equipment to substitute for militarized computer equipment; and
- --redefine battalion level device requirements (because the TCT did not meet battalion needs).

1984 The Hewlett-Packard 9920U 16-bit microprocessor was selected as the TCT substitute (termed the Tactical Computer Processor (TCP)).

1985 MCS fielding was delayed due to software development problems and failure of the TCS and TCT to pass first article testing.

The user requested major system changes.

Defense Appropriations Conference Report 99-450 that requested the Army to provide a revised MCS computer equipment procurement and distribution plan by March 1986 was issued.

1986 Major changes were made to the MCS program:

- --the TCS was deleted resulting in over $26 million in lost hardware and software costs;

--the TCP was changed from the 16-bit Hewlett Packard 9920U microprocessor to the 32-bit Hewlett Packard 320 microprocessor; and

--a ruggedized NDI commercial analyst console (AC) (the Hewlett Packard 310 microprocessor) was added to the TCP configuration.

On March 5, 1986 the Assistant Secretary of the Army (Research, Development and Acquisition) submitted a report on the proposed procurement and distribution plans for both the militarized (MIL) and ruggedized NDI commercial equipment for the MCS program. The report identified a requirement for $223.6 million to implement the following procurement plan to complete the computer equipment acquisitions needed to field the MCS for the active forces.

	FY'86	FY'87	FY'88	Total
TCT/BMD (MIL)	32	--	--	32
TCT (MIL)	74	--	--	74
TCP (NDI)	28	187	352	567
AC (NDI)	40	362	677	1,079
Funding (Millions)	$56.7	$56.9	$110.0	$223.6

BMD = Bubble Memory Device
FY = Fiscal Year

Tests are underway for a militarized hard disk to provide expanded secondary storage capacity (50 million bytes versus the 8 million bytes of the BMD) at less than 15 percent of the cost of the BMD the Army plans to acquire.

Contract negotiations for the acquisition of militarized computer equipment began on May 5, 1986.

The Army now plans to begin initial fielding of MCS militarized computer equipment in July 1986.

MCS budget for fiscal year 1986 through 1988 (in millions)

Category	FY'86	FY'87	FY'88	Total
Procurement	$56.7	$56.9	$110.0	$223.6
RDT&E	$ 8.6	$ 9.4	$ 14.9	$ 32.9 a/

a/Research, development, test and evaluation (RDT&E) costs are planned beyond fiscal year 1988 for software development and system enhancements.

The fiscal year 1987 budget request reflects a funding decrease over previous projections because the Army eliminated $15.6 million for the procurement of battalion level computer equipment. The January 22, 1986 Army command cost estimate for the MCS program indicates a total requirement of $120 million for the procurement of MCS computer equipment to automate the battalion echelon.

The Army will delay fielding an MCS battalion level device until at least 1990 when such equipment is scheduled to become available through the Army Command and Control Systems (ACCS) program computer equipment procurement. Placing computer equipment at the battalion level was assessed by the Army to be a major portion (54 percent) of the completed system's total automation.

MCS equipment acquisition

	TCT/BMD	TCT	TCP	AC
Prior Years	31	65	0	0
Need to Acquire	23	87	567	1,079
Total	54	152	567	1,079

MCS software development and fielding schedule

Software

1986	1987	1988	1989	1990	1991
V-9	V-10	V-11	V-12	V-13	V-14
Ada	Unix	BF SIM	NATO	Tutorials	DAT
DBMS	COTS		Protocol		
	LAN				

Ada = Department of Defense Programming Language
BF SIM = Battlefield Simulation
DAT = Decision Analysis Tools
DBMS = Data Base Management System
COTS = Commercial Off-the-shelf Software
LAN = Local Area Network
Unix = Commercial Operating System
V = MCS Software Version

Fielding

	1986	1987	1988	1989	1990	1991
MIL	3QTR----------		4QTR			
NDI		1QTR----------		3QTR		
ACCS					---------->	
Reserves						--->

ASSESSMENT OF THE ARMY MCS PLAN

Overstated equipment costs in the Army plan corrected by over $47 million

On April 15-27, 1986, we met on several occasions with Army MCS project management and contracting officials and questioned the cost specified in the Army plan for ruggedized NDI commercial equipment (TCPs and ACs) based on cost patterns for similar procurements and costing information received from the MCS integration contractor. On April 29, 1986, the Army project manager for the acquisition of TCPs and ACs provided corrected unit costs that result in a $47.1 million reduction of the Army plan's cost estimate for this equipment.

Inaccuracies in Unit Costs

			Army Estimated Unit Costs	
Device	FY	Qty	Plan	Corrected
TCP	1986	28	$211,000	$179,700
TCP	1987	187	$219,000	$179,700
TCP	1988	352	$226,000	$140,200
AC	1986	40	$ 43,000	$ 38,700
AC	1987	362	$ 44,000	$ 38,700
AC	1988	677	$ 45,000	$ 35,300

Impact of Unit Cost Corrections on the Cost of TCPs and ACs

Army Plan	$174,526,000
Army Corrected Costs	$127,441,400
Estimated Reduction	$ 47,084,600

The quantities of militarized computer equipment in Army plan are inconsistent with those in other Army documents

The following statement of additional MCS militarized computer equipment needed is based on the Army's March 7, 1986, MCS computer equipment distribution plan and a statement of computer equipment acquired under the MCS militarized computer equipment contract provided by the MCS project manager.

Revised MCS Computer Equipment Acquisitions

	Plan	Need to Acquire	Value (in Millions)
TCT/BMD	32	23	($5.7)
TCT	74	87	$5.1
Carryover Equipment a/			($2.0)

a/Previously purchased printers (23) and power supplies (23) for the TCS can be used on the TCT.

Requirements for MCS militarized computer equipment are inconsistent with the ACCS hardness requirements analysis for electronic equipment

The Army's stated required operational capabilities for the MCS include requirements for the system to operate in tracked vehicles and to function in a nuclear environment. The Army MCS proponent advocates the use of militarized computer equipment for MCS at all echelons because of the criticality of the functions to be supported and concerns about the effects of tracked vehicle vibration and nuclear explosions on equipment operation.

However, an ACCS hardness requirements analysis for electronic equipment, which will guide the specification of requirements for the ACCS program computer equipment procurement, considered these factors and indicates militarized computer equipment is not needed at corps and division echelons. The ACCS program computer equipment procurement is intended to provide a common family of militarized, ruggedized commercial, and standard commercial computer equipment to support the requirements of the Army's primary tactical command and control systems (maneuver control, air defense, fire support, intelligence/electronic warfare, and combat service support). If implemented on schedule, the ACCS program computer equipment procurement would, beginning in 1990, provide equipment to replace the MCS equipment now being proposed for acquisition. If the ACCS hardness requirements analysis is used to establish computer equipment requirements, the ACCS program computer equipment procurement would provide standard and ruggedized NDI commercial equipment to replace MCS militarized equipment at corps and division echelons.

Further, the Under Secretary of the Army in 1983 and again in 1986 questioned the need for militarized equipment for automated systems. In March 1986, the Under Secretary directed the Army to use NDI off-the-shelf equipment to get on with system automation of a command and control system similar to MCS. He also stated

that the program manager for the ACCS program must be the suppressor and challenge all of the requirements for militarized equipment.

The elimination of TCTs and BMDs at corps and division echelons would permit an estimated reduction of $27 million in militarized computer equipment cost.

		Army Plan Procurements a/		Revised Procurements	
Device	Unit Cost	Qty	Cost	Qty	Cost
TCT/BMD	$630,000	23	$14,490,000	--	---
TCT	$390,000	87	$33,930,000	55	$21,450,000
Total			$48,420,000		$21,450,000

Estimated Reduction = $26,970,000

a/Assuming GAO Revisions to Equipment Quantities

Summary of Computer Equipment Cost Adjustments and Cost Reductions from the Elimination of TCTs and BMDs at Corps and Division Echelons (in Millions)

	FY'86	FY'87	FY'88	Est. Reduction	Est. Total
Army Plan	$56.7	$56.9	$110.0	---	$223.6
Corrected Unit Cost	($ 1.0)	($ 9.3)	($ 36.8)	($47.1)	---
Corrected Quantity	($ 2.6)	---	---	($ 2.6)	---
Reduction of TCTs and BMDs	($27.0)	---	---	($27.0)	---
				($76.7)	
Adjusted Program Cost					$146.9

MCS report indicates the need to increase the technical capabilities of MCS militarized computer equipment

The system integrator's objective architecture report indicates the need for improvements that will be difficult to implement and which are not currently programmed for the TCT and BMD. These include:

--expansion of main memory on the TCT from 1 million to 4 million bytes (needed for Version 11 MCS software in 1988);

--increase in secondary storage capacity for TCT beyond the current capacity of the BMD (needed for Version 10 MCS software in 1987 and Version 12 MCS software in 1989);

--addition of a commercial operational system for the TCT (needed for Version 10 MCS software in 1987); and

--upgrade from the 16-bit TCT to a 32-bit militarized microprocessor (needed for Version 11 MCS software in 1988).

The TCT requires an external power supply that may not be capable of operating after a nuclear explosion.

The MCS project manager indicates that upgrades to increase the capabilities of the TCT and BMD are not planned due to considerations of technical complexity, cost, time and near-term equipment replacement under the ACCS program.

The Army developer of MCS requirements advised that currently planned TCPs have adequate processing capacity to permit the elimination of TCTs and BMDs without replacement. The primary purpose of the militarized computer equipment is to provide a survivable processing capability.

The MCS project manager has indicated that a major program delay would not result from the reduction of militarized TCTs and BMDs. However, if the Army were not allowed to field militarized computer equipment at corps and divisions echelons, the Army would delay fielding militarized computer equipment until ruggedized NDI commercial computer equipment was available.

PLAN's CONSISTENCY WITH CONGRESSIONAL GUIDANCE

Congressional guidance centered on the following major areas of program direction:

--the limitation of militarized computer equipment to the training base, forward deployed and early deploying active component forces for the European, Korean, and Southwestern Asian Theaters;

--the completion of procurements for militarized computer equipment in fiscal year 1986 and ruggedized NDI commercial computer equipment in fiscal year 1987; and

--the establishment of an aggressive test and evaluation program.

The consistency of the Army's plan with congressional guidance by each major area of program direction is as follows.

Limit militarized equipment to training base, forward deployed and early deploying active component forces for the European, Korean, and Southwestern Asian Theaters

The Army plan would equip the training base, 5 corps, 11 heavy divisions, 6 light divisions, 3 air cavalry regiments, and 5 separate brigades with militarized computer equipment.

The 6th Infantry division would be equipped entirely with ruggedized NDI commercial computer equipment.

The Army indicates that the 17 divisions that would receive militarized as well as ruggedized NDI commercial MCS computer equipment have the following characteristics:

--five divisions are forward deployed;

--special provisions have been made to rapidly deploy six divisions to meet treaty commitments; and

--the remaining six divisions would be deployed as soon as arrangements could be made for the transportation of men and equipment.

However, the congressional staff who developed the congressional guidance for the MCS program provided in Defense Appropriations Conference Report 99-450 indicate that the guidance was developed under the assumption that only 11 divisions were considered forward deployed or early deploying.

Cost effect of eliminating TCTs and BMDs for six divisions

Assuming that the training base, corps, separate brigades, air cavalry regiments, and 11 active divisions were equipped with a mix of militarized and ruggedized NDI commercial computer equipment and the other 7 active divisions received the ruggedized NDI commercial computer equipment configuration specified in the Army's plan for the 6th infantry division, the estimated cost for militarized computer equipment could be reduced from $48.4 million to $24.5 million, for an estimated program cost reduction of $23.9 million.

		Army Plan Procurements a/		Revised Procurement	
Device	Unit Cost	Qty	Cost	Qty	Cost
TCT/BMD	$630,000	23	$14,490,000	11	$ 6,930,000
TCT	$390,000	87	$33,930,000	45	$17,550,000
Total			$48,420,000		$24,480,000

Estimated Reduction = $23,940,000

a/Assuming GAO Revisions to Equipment Quantities

This reduction combined with other cost adjustments would permit an estimated total reduction of $73.6 million and an adjustment in total program cost from $223.6 million to $150 million.

Summary of Computer Equipment Cost Adjustments and Cost Reductions from the Elimination of TCTs and BMDs for Six Divisions (in Millions)

	FY'86	FY'87	FY'88	Est. Reduction	Est. Total
Army Plan	$56.7	$56.9	$110.0	---	$223.6
Corrected Unit Cost	($ 1.0)	($ 9.3)	($ 36.8)	($47.1)	---
Corrected Quantity	($ 2.6)	---	---	($ 2.6)	---
Reduction of TCTs & BMDs	($23.9)	---	---	($23.9)	---
				($73.6)	
Adjusted Program Cost					$150.0

Combined cost effect of eliminating TCTs and BMDs for the brigades of six divisions and at corps and division echelons

If militarized computer equipment deployment were limited to only the brigades of 11 divisions, separate brigades, air cavalry regiments, and the training base, and only ruggedized NDI commercial computer equipment were used to equip the brigades of 7 divisions and corps and division echelons, we estimate that militarized computer equipment cost would be reduced by $43.4 million to $5.1 million.

		Army Plan Procurements a/		Revised Procurement	
Device	Unit Cost	Qty	Cost	Qty	Cost
TCT/BMD	$630,000	23	$14,490,000	--	---
TCT	$390,000	87	$33,930,000	13	$5,070,000
Total			$48,420,000		$5,070,000

Estimated Reduction = $43,350,000

a/Assuming GAO Revisions to Equipment Quantities

This reduction combined with other cost adjustments would permit an estimated total reduction of $92.2 million and a revision in program cost from $223.6 million to $131.4 million.

Summary of Computer Equipment Cost Adjustments and Cost Reductions from the Elimination of TCTs and BMDs for the Brigades of Six Divisions and at Corps and Division Echelons (in Millions)

	FY'86	FY'87	FY'88	Est. Reduction	Est. Total
Army Plan	$56.7	$56.9	$110.0	---	$223.6
Corrected Unit Cost	($ 1.0)	($ 9.3)	($ 36.8)	($47.1)	---
Corrected Quantity	($ 1.7)	---	---	($ 1.7)	---
Reduction of TCTs & BMDs	($43.4)	---	---	($43.4)	---
				($92.2)	
Adjusted Program Cost					$131.4

Complete MCS procurement of militarized computer equipment in fiscal year 1986 and ruggedized NDI commercial computer equipment in fiscal year 1987

The Army plan provides for the completion of MCS militarized computer equipment procurements in fiscal year 1986.

However, procurement of ruggedized NDI commercial computer equipment is planned for fiscal years 1986 through 1988.

--In submitting its plan, the Army assumed a separate production cycle for each of the three fiscal years (1986 through 1988).

--Reduction in equipment production time is complicated by the ruggedized NDI commercial communications device which requires 9 to 12 months to produce.

--It is possible that equipment production time could be reduced if adequate funding, and expanded production facilities and assembly personnel were made available in fiscal year 1987. However, the Army's ability to effectively employ equipment at a faster rate than the current production schedule would provide has not been assessed.

Establish an aggressive test and evaluation program

There is no approved test and evaluation program for MCS. Draft plans do not provide for a formal operational test prior to production commitments. Department of Defense and Army regulations and guidance (Defense Acquisition Circular Number 76-43, Department of Defense Directive Number 5000.3, and Army Regulation 70-1) direct that a complete prototype system, including software, be built to production specifications and

subjected to final developmental and operational testing prior to making production commitments. Past GAO reports have also stressed the need for adequate operational testing before committing to production. The Army has scheduled some limited tests in 1986 and 1987:

--single path operational test of Version 9 MCS software (July 1986);

--Version 9 MCS software stress test (August/September 1986);

--limited TCP test (second quarter of 1986);

--system test (corps to brigade slice) (first quarter of 1987);

--TCT first article testing (June 1986); and

--ruggedized NDI commercial equipment first article testing (July 1987).

The Army is trying for a full system evaluation in 1987 or 1988.

APPENDIX I

99TH CONGRESS, 1st Session | HOUSE OF REPRESENTATIVES | REPORT 99-450

HOUSE JOINT RESOLUTION 465, FURTHER CONTINUING APPROPRIATIONS FOR FISCAL YEAR 1986

DECEMBER 19, 1985.—Ordered to be printed

Mr. WHITTEN, from the committee of conference, submitted the following

CONFERENCE REPORT

[To accompany H.J. Res. 465]

MANEUVER CONTROL SYSTEM

The conferees recommend $60,000,000 for the Maneuver Control System (MCS). The conferees are concerned about the relatively high cost of military standard equipment and direct that provision of military standard equipment be limited to the training base and to the forward deployed and early deploying active component forces for the European, Korean, and Southwestern Asian Theaters. The conferees intend that (1) military standard equipment for these forces will be supplemented with nondevelopmental (NDI) equipment, (2) other active forces will be equipped entirely with NDI equipment, and (3) military standard equipment will be redistributed to the reserve component forces when the active forces are re-equipped under the Army Command and Control System (ACCS) program. The conferees direct that, to achieve greatest economy, priority should be given to acquiring the remaining military standard equipment in fiscal year 1986. For the remainder of the program equipment, procedures should be established to ensure that procurement and the ability to field this equipment is synchronized.

The conferees direct the Army to report to the Defense Appropriations Subcommittees of the House and Senate prior to obligation, but no later than March 1, 1986, on its proposed procurement and distribution plans of both military standard and NDI equipment for this program.

The conferees are aware that the MCS program has been developed and tested on an evolutionary basis and intend that the continuing development of the MCS will provide critical learning experience for the follow-on ACCS program. The conferees therefore direct that procurement be planned for completion in fiscal year 1987 and that fielding of this equipment be done expeditiously. An aggressive test and evaluation program should be established to ensure maximum transfer of MCS experience to the follow-on ACCS program. The success of this program is of interest to the conferees. Reports on its status should therefore be made from time to time to the Defense Appropriations Subcommittees of the House and Senate.

APPENDIX II

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

5 MAR 1986

Honorable Joseph P. Addabbo
Chairman
Subcommittee on Defense
Committee on Appropriations
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

House of Representatives Report 99-450 requested that the Army provide the Committee with a report on the proposed procurement and distribution plans for both the military standard and NDI equipment for the Maneuver Control System (MCS) program.

Enclosed is the Army's report detailing the procurement and distribution plans for this system. In order to comply with Congressional guidance to complete procurement of the military standard equipment in FY 1986, and to minimize costs associated with this program, the Army will procure no additional Tactical Computer Systems (TCS), but, will procure in their place the Tactical Computer Terminal (TCT) with a bubble memory.

We believe the rapid fielding of the MCS system described in the report will provide important lessons to support the ACCS program. A vigorous test and evaluation program is being established to ensure lessons learned with MCS are transferred to the ACCS program.

I hope this information will prove useful in your future budget deliberations.

Sincerely,

J.R. Sculley
Assistant Secretary of the Army
(Research, Development and Acquisition)

Enclosure

GAO Note: We have not included the charts to this enclosure.

REPORT ON THE MANUEVER CONTROL SYSTEM (MCS)

1. This report responds to the Congressional direction that the Army report on the procurement and distribution plans for the Maneuver Control System by March 1, 1986.

2. The Army has reviewed the MCS program in light of the Congressional guidance and the recently approved Operational and Organizational (O&O) plan for the MCS system. Based on this review, the procurement plan has been revised to complete procurement of military standard equipment with FY86 funds. FY87 and FY88 funds will be used entirely to buy-out and rapidly field the Non-developmental Item (NDI) equipment for the MCS by the end of FY 1989.

MCS Procurement Plan

	FY86	FY87	FY88
Tactical Computer Terminal with Bubble Memory (TCT w/B)	32		
Tactical Computer Terminal (TCT)	74		
Tactical Computer Processor (TCP)	28	187	352
Analyst Console (AC)	40	362	677
Funding ($ in millions)	56.7[1]	56.9	110.0[2]

[1] Reflects Gramm-Rudman reduction of $3.3 million from FY86 Congressional Appropriation of $60.0M.

[2] The Army plans to adjust the FY88-92 POM to fund this amount to complete Non-developmental Item (NDI) procurement in FY88.

3. The revised MCS O&O plan provides staff processing capability through the use of TCPs and ACs at the main and tactical command posts at Corps through Brigade levels. The substitution of a group of TCPs with their 2 communications channel capability provided the opportunity to eliminate the high cost TCS, with its 8 communications channels, from the MCS architecture. The TCT with the addition of a bubble memory (TCT w/B) has the same storage capacity as the TCS and will be procured in its place. A flexible network for connectivity within the MCS network will be obtained by utilizing four TCPs in conjunction with a TCT w/B, as shown at enclosure 1, and will provide the required 8 channel capacity.

APPENDIX II

4. The Army will limit military standard equipment to the training base and forward deployed and early deploying active component and roundout forces. By eliminating further procurement of the TCS, the Army is able to buy out the military standard equipment for seventeen active divisions in FY86, meeting the requirements for a militarized backbone. These divisions all deploy within the first 30 days of conflict. The military standard equipment will be supplemented with NDI equipment as shown at enclosure 2. The plan is to redistribute military standard and NDI equipment to the reserve component forces when active forces are re-equipped under the ACCS program.

APPENDIX III

Congress of the United States
House of Representatives
Committee on Appropriations
Washington, DC 20515

January 28, 1986

Honorable Charles A. Bowsher
Comptroller General of the United States
General Accounting Office
Washington, D. C. 20548

Dear Mr. Bowsher:

As part of the Subcommittee's oversight of the Department of Defense's programs, I am asking the General Accounting Office to conduct a review of the Army's plan to put in place a command, control, and communications network to satisfy the needs of battlefield commanders in the 1990's and beyond. The significance of this network lies both in its cost, which is estimated in the billions of dollars over its life cycle, and in its role as a command and control system which will help manage substantial amounts of combat resources, including personnel and weapons. Implementation of the Army's plan is especially important to ensure success of the recently approved Airland Battle doctrine which emphasizes maneuverability and close coordination of all elements of combat power.

The Subcommittee's primary objective is to gain an understanding of the program which will eventually place a vast number of computers, terminals, radios, and other devices on the battlefield. Of particular concern is the Army's plan for using new communications systems such as Mobile Subscriber Equipment (MSE) and SINCGARS, to tie together the computers that will help manage the battle. Several key issues which I would like GAO to address are as follows.

-- What are the performance, schedule, and cost goals of the major components of the Army's Command and Control System (ACCS) architecture?

-- Are the development and acquisition of the ACCS subsystems adequately coordinated to provide standard, interoperable hardware and software components such as computers, work stations, displays, and communications facilities?

-- Do the communications systems being purchased by the Army have adequate capacity and interoperability to support intelligence, air defense, fire support, maneuver, and combat service support?

APPENDIX III

-- What is the status of the acquisition and fielding of those communications systems, particularly with respect to development problems, frequency considerations in their deployment areas, and their ability to operate with current U.S. assets and allied systems?

-- Does the Army have a cost effective acquisition approach making maximum use of off-the-shelf equipment and consolidated purchases to achieve unit cost reductions?

-- Are the Army and other Services recognizing and exploiting opportunities for common communications equipment such as switches and radios for ground combat?

-- What hardware components will be used for the ACCS air defense subsystem? Will they contain adequate sensor, processing, and communications capability to provide key information about targets to the gunners in sufficient time to capitalize on the advanced capabilities of weapons such as Stinger, Chapparal, and Patriot?

-- Does the ACCS computer program provide a sound approach for identifying and acquiring a common family of computer equipment and software for Army command and control systems?

-- Have ACCS computer program equipment and software requirements been defined with adequate consideration to the various processing requirements of Army command and control systems? How was the mix of militarized, ruggedized and commercial equipment planned for acquisition established and are the militarized components specified the minimum essential?

-- What impact has the ACCS computer program had on current Army command and control system development efforts? Are current development efforts and the ACCS computer program consistent and well coordinated, or are changes in these efforts needed?

-- Does the Army's revised maneuver control system computer equipment procurement and distribution plan comply with guidance in the fiscal year 1986 Department of Defense Appropriations Conference Report? Does the Army's plan provide a sound approach and economical solution, particularly considering planned equipment replacements under the ACCS computer program, for meeting the Army's stated requirements?

The GAO recently assisted the Subcommittee on issues relating to the multibillion dollar MSE program. Since MSE is a key element in the Army's command and control architecture, I would like GAO to continue reviewing this program and advise the Subcommittee staff in preparation for the fiscal year 1987 budget process.

APPENDIX III

Due to the comprehensive nature of this request and the short timeframes allowed for our fiscal year 1987 appropriations work, I believe a two phased approach might be most beneficial to the Subcommittee. In the first phase, GAO could provide interim findings that have impact on the fiscal year 1987 appropriations request. The second phase would permit GAO to investigate the issues in greater depth and provide its results in time for the fiscal year 1988 budget process. As your review proceeds, I would encourage your staff to provide verbal or other informal briefings to the Subcommittee on an ad-hoc basis. Your staff should contact Mr. Bruce Meredith of the Subcommittee staff as soon as possible to arrange the work necessary to carry out my request.

With best wishes,

Sincerely,

Joseph P. Addabbo
Chairman
Subcommittee on Defense

APPENDIX IV

United States Senate
COMMITTEE ON APPROPRIATIONS
WASHINGTON, DC 20510

February 5, 1986

The Honorable Charles A. Bowsher
Comptroller General of the United States
U.S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Bowsher:

As part of the Subcommittee's oversight of Department of Defense programs, I would like the General Accounting Office to review the Army's plan to put in place a command, control, and communications network to satisfy the needs of battlefield commanders in the 1990's and beyond. Implementation of this multi-billion dollar plan is essential to the success of the recently approved Airland Battle doctrine.

The Subcommittee's primary objective is to gain an understanding of the costs, schedule and risks of this program which will eventually place large amounts of software and a vast number of computers, terminals, radios, and other devices on the battlefield. Of particular concern is the Army's plan for using new communications systems such as Mobile Subscriber Equipment, the Army Data Distribution Systems or PJH, and SINCGARS, to tie together the computers that will help manage the battle.

On a related matter, the GAO recently assisted the Subcommittee on the Army's MSE program. Since MSE is a key element in the Army's command and control architecture, I would like GAO to continue monitoring this program and advise the Subcommittee staff in preparation for the fiscal year 1987 budget process.

Due to the comprehensive nature of this request and the limited time available for our fiscal year 1987 appropriations work, I believe a two phased approach might be beneficial. First, provide interim findings that have impact on the fiscal year 1987 appropriations request. The second phase would permit you to investigate the issues in greater depth and provide results in time for the fiscal year 1988 budget process. As your review proceeds, I would like your staff to contact Mr. Richard Ladd of the Subcommittee staff.

With best wishes,

Cordially,

TED STEVENS
Chairman
Subcommittee on Defense

(510156)

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