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

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BATTLEFIELD AUTOMATION

Army Needs to Update Fielding Plan for First Digitized Corps

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Accountability * Integrity * Reliability

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National Security and
International Affairs Division

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The Honorable Jerry Lewis
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

Over the next decade, the Army plans to field dozens of new and improved battlefield systems through its "digitization" initiative. Digitization involves the application of information technologies to acquire, exchange, and employ timely information on the battlefield. Use of digitization on the battlefield is expected to increase the Army's survivability, lethality, and tempo of operations.[1] The Army plans to equip its first digitized division by December 2000, its first digitized corps[2] by the end of 2004, and its remaining active and reserve divisions and corps by 2015. The Army plans to invest about $17.4 billion for digitization from fiscal year 2001 through fiscal year 2005.

The Army's first digitized corps will be III Corps, which consists of the 4th Infantry Division, the 1st Cavalry Division, and the 3rd Armored Cavalry Regiment. The 4th Infantry Division is scheduled to become the Army's first digitized division through the fielding of 16 high-priority systems to the division by December 2000. These high-priority systems are designated "Category 1" systems, and can generally be described as command, control, and communications systems that support decision-making by commanders located in tactical operations centers.[3] By December 2003, the Army plans to equip its second digitized division (the 1st Cavalry Division) with both Category 1 systems and as many "Category 2" systems as are available. Fifty-six systems have been designated as Category 2. These

[1] Tempo of operations generally refers to a commander's ability to conduct operations at a time and place of the commander's choosing.

[2] An Army division generally consists of 12,000 to 18,000 soldiers; there are 10 divisions within the active Army. An Army corps comprises two or more divisions; there are four corps within the active Army.

[3] Tactical operations centers generally refer to fixed and relocatable command posts where commanders and their staffs prepare, monitor, and alter the execution of battle plans.

systems are considered to be lower in priority than Category 1 systems and generally involve the fielding of new or enhanced battlefield platforms, such as the Crusader self-propelled howitzer, Abrams tank, and Bradley Fighting Vehicle. The final phase of the first digitized corps fielding plan is scheduled for completion in 2004, when all III Corps units are fielded with Category 1 and available Category 2 systems.

Last year, we provided the Subcommittee with a report on the acquisition status of the Category 1 systems.[4] This report responds to the Subcommittee's request that we examine the acquisition status (schedule and cost) of the Category 2 systems.

Results in Brief

Our analysis of the acquisition status of the 56 Category 2 systems indicates that about 30 percent of the systems are already fielded or likely to be ready by the 2004 fielding milestone, about 50 percent may not be ready, and about 20 percent will not be ready. The systems that are likely to be ready include a small number of systems already fielded and others expected to be fielded by 2004. Other systems may not be ready because development schedules are not consistent with the year 2004 milestone, operational testing has not been performed, or interoperability demonstrations have not been completed. Also, there are systems that will not be ready because of funding shifts or development schedules that are not matched to the fielding milestone. Based on current Army projections, the 56 Category 2 systems will require significant investment: total estimated development and procurement funding needs are $4 billion for fiscal year 2001 and $4.4 billion for fiscal year 2002. Because of the uncertain availability of most of the 56 Category 2 systems by 2004,we are concerned that organizational decisions are being made on the assumption that these systems will be ready by 2004. For example, we observed that the Army had already made decisions to reduce the number of soldiers needed to fulfill missions, based on the expected benefits of some of the 56 Category 2 systems, even though these systems are still only being developed or tested.

To provide decisionmakers within the Army with a detailed understanding of the impact the availability of Category 2 systems will have on other decisions, we are recommending that the Army prepare an annual

[4] See *Battlefield Automation: Performance Uncertainties Are Likely When Army Fields Its First Digitized Division* (GAO/NSIAD-99-150, July 27, 1999).

acquisition status report that identifies when each Category 2 system is expected to be fielded and alternative fielding strategies focused on what is needed to successfully establish the first digitized corps by the end of 2004. DOD and the Army agreed with our recommendation and will implement it as part of an existing Army reporting process.

Background

Throughout the next decade and beyond, the Army plans to continue to modernize its forces. Included within the modernization objectives is the integration of information technologies to acquire, exchange, and employ timely information needed for battle. The integration of information technologies objective is referred to as digitization and will be implemented within the Army through the development, production, and fielding of over 100 individual systems. The Army's digitization effort includes high-priority systems (designated by the Army as Category 1), lower-priority systems (known as Category 2), and other systems without a priority ranking. For example, the Force XXI Battle Command, Brigade and Below system, which is intended to provide enhanced information to the lowest tactical level—the individual soldier—and a seamless flow of command and control information across the battlefield, is a high-priority system. The Battlefield Combat Identification System, which is intended to provide a high probability of identifying friendly forces on the battlefield so that fratricide rates can be reduced, is a lower-priority system. The Javelin antitank weapon system and the Gun Laying Positioning System are not designated as priority systems but rely to a great extent on the use of information technology.

In general, information technologies needed to conduct a battle are available only to Army commanders in tactical operations centers, where commanders (of units ranging in size from 500 to 100,000 soldiers) and their staffs prepare, monitor, and alter the execution of battle plans. Providing information technologies to the thousands of soldiers operating outside the tactical operations centers—in the battlefield—will allow them to know precisely where they are located on the battlefield, where friendly forces are located, and where enemy forces and obstacles are located. The Army expects this information to increase the lethality, survivability, and operational tempo of its forces.

In August 1997, the Deputy Chief of Staff for Operations and Plans announced that the 4th Infantry Division would be the first digitized division and that, at a minimum, fielded equipment would include the Army Training and Doctrine Command's list of Category 1 systems. There are 16

Category 1 systems, and the scheduled fielding date for the Fort Hood units of 4th Infantry Division is December 2000. The Deputy Chief of Staff also announced that the Army's second digitized division would be the 1st Cavalry Division and that fielded equipment would include the Category 1 systems and those Category 2 systems ready for fielding by the end of 2003. The final phase of the first digitized corps fielding plan is scheduled for completion in 2004 when all III Corps units are expected to be fielded with Category 1 and 2 systems. Table 1 summarizes the Army's fielding milestones.

Table 1: The Army's Near-Term Digitization Milestones

Date	Major III Corps units	Fielding objective
December 2000	4th Infantry Division brigades based at Fort Hood, Texas	• 16 Category 1 systems
December 2003	1st Cavalry Division based at Fort Hood, Texas	• 16 Category 1 systems • As many Category 2 systems as are ready
December 2004	4th Infantry Division brigade based at Fort Carson Colorado 3rd Armored Cavalry Regiment based at Fort Carson, Colorado, and all other III Corps units	• 16 Category 1 systems • As many Category 2 systems as are ready

Digitization, under way since the mid-1990s, is proceeding at the same time that profound structural changes to the Army's fighting components are being considered. The Army considers III Corps a "heavy" force because the predominate battlefield platforms within the Corps are armored vehicles such as the Abrams tank, the Bradley Fighting Vehicle, and the Paladin self-propelled howitzer. Six of the 10 divisions within the active Army are considered mechanized or heavy divisions. "Light" forces such as the XVIII Airborne Corps complement the heavy forces; together these two forces constitute most of "the Army." Light forces rely on mobility and such weapon systems as mortars and towed howitzers. There are four light divisions within the active Army. Light forces can be mobilized and deployed in a relatively short period of time; at the same time, the length of their initial missions generally does not exceed 4 days. It takes longer to mobilize and deploy heavy forces, but their initial missions can be long in duration. In October 1999, the Army Chief of Staff announced that the Army would evolve into a "medium-weight" force by making heavy forces more strategically deployable and more agile and by making light forces more lethal, survivable, and tactically mobile. These objectives are nearly identical to the expected benefits of digitization, and it is likely that the design of the Army's medium-weight force will depend on the expected benefits of digitization. Every element of the medium-weight force is

envisioned to generate combat power and contribute decisively to the fight. Completion of the medium-weight force design is scheduled for 2003. Notwithstanding this medium-weight force initiative, the Army is committed to fielding its first digitized corps by the end of 2004.

Acquisition Status of Category 2 Systems Varies, and Half Have Uncertainties Associated With Their 2004 Availability

Our analysis of the acquisition status of the 56 Category 2 systems indicates that about 30 percent of the 56 Category 2 systems are likely to be ready, 50 percent may not be ready, and 20 percent will not be ready by 2004. The systems that are likely to be ready include a small number of systems already fielded and others expected to be fielded by 2004. Other systems may not be ready because development schedules are not consistent with the year 2004 milestone, operational testing has not been performed, or interoperability demonstrations have not been completed. Also, there are systems that will not be ready because of funding shifts or development schedules that are not matched to the fielding milestone. In completing our analysis, we relied on data provided by Army officials. While different Army organizations were able to offer analyses based on their unique perspective (test and evaluation, user, or material developer), a comprehensive overview analysis that included each of the 56 Category 2 systems was lacking. Table 2 summarizes our analysis of the individual Category 2 systems and identifies those on schedule for fielding, those that may not be ready, and those that will not be ready by 2004. We estimate that in fiscal year 2001, the 56 Category 2 systems will require $1.6 billion in development funding and $2.4 billion in procurement funding and that in fiscal year 2002 development and procurement funds will be $1.9 billion and $2.5 billion, respectively. These estimates are consistent with prior Army estimates. Appendix I provides funding estimates for each of the Category 2 systems for fiscal years 2001 and 2002.

Table 2: Category 2 Systems, by Availability

18 systems already fielded or expected to be fielded by 2004	26 systems with uncertain availability by 2004	12 systems that will not be ready by 2004
Already fielded	Development schedule indicates may not be ready by 2004	Terminated
• Linebacker		• Command and Control Vehicle
• Sentinel	• Airborne Communications Node	• Grizzly Engineering Vehicle
• Trojan Spirit	• Battle Command Vehicle	• Wolverine Heavy Assault Bridge
	• Ground-Based Common Sensor-Heavy/Prophet Ground	
Expected to be fielded	• Joint Tactical Radio System	Restructured
• Analysis Control Team Enclave	• Joint Warning and Reporting Network	• Crusader
• AH-64D Apache	• Land Warrior	• Future Scout and Cavalry System
• Aviation Tactical Operations Centers	• Personal Communications System	• Prophet Air intelligence/electronic warfare system
• Avenger Slew-to-Cue	• Smart Cards	
• Common Ground Station/Ground Station Module	Require operational testing	Development schedule indicates system will not be ready by 2004
• Contact Maintenance Truck		
• Digital Topographic Support System	• Aviation Mission Planning System	
• Firefinder	• Battlefield Combat Identification System	• Army Airborne Command and Control System
• Integrated Meteorological System	• Bradley Fire Support Team Vehicle (M7)	• Palletized Loading System-Enhanced-Driver Viewer Enhanced
• M93A1 Fox	• Defense Message System/Tactical Message System	• Raptor Intelligent Combat Outpost
• OH-58D Kiowa Warrior	• Global Combat Support System-Army	• Tactical Interactive Ground Equipment
• Paladin	• Lightweight Laser Designator Rangefinder	• Wireless Local Area Network
• Palletized Loading System-Enhanced-Movement Tracking System	• Long Range Advanced Scout Surveillance System	• RAH-66 Comanche
• Standard Installation/Division Personnel System 3	• M1A2 Abrams tank with system enhancements	
• Tactical Operations Centers	• M2A3 Bradley Fighting Vehicle	
	• Medical Communications for Combat Casualty Care/Joint Theater Medical Information Program	
	• Mobile Integrated Tactical Terminal/Division Tactical Exploitation System	
	• Mortar Fire Control System	
	• Multiple Launch Rocket System	
	• Radio Frequency Tags	
	• Striker (M707)	
	• Tactical Airspace Integration System	
	• Tactical Unmanned Aerial Vehicle	
	• Transportation Coordinators Automated Information for Movement System II	

Note: Three systems (Digital Topographic Support System, Integrated Meteorological System, and Tactical Airspace Integration System) have their own individual acquisition status but are also required to complete interoperability testing. This issue is discussed later in this report.

Source: GAO analysis of acquisition status of each Category 2 system.

Eighteen Category 2 Systems Should Be Ready for Deployment by 2004

Our analysis of the current acquisition status of the 56 Category 2 systems indicates that 18 systems are already fielded to the first digitized corps or are on schedule for fielding. Those that have already been fielded are Linebacker, Sentinel, and Trojan Spirit. The fielding schedules for the remaining systems appear in table 3.

Table 3: Fielding Status of Category 2 Systems That Should Be Ready by 2004

System	Fielding status
Analysis Control Team Enclave	The All Source Analysis System remote workstations used in the Analysis Control Team Enclave have completed operational testing, and all units should be fielded by the end of 2000.
AH-64D Apache Longbow	Fielding to the first digitized corps is expected to be completed by May 2004. However, the improved data modem, which performs as the Internet controller for aviation assets, will have limited capabilities through the Division Capstone Exercise in April 2001. An enhanced version of the modem is eventually expected to have full capabilities.
Aviation Tactical Operations Center	See Tactical Operations Centers.
Avenger Slew-to-Cue	Fielding of Avenger to the first digitized corps is expected to be completed by 2002.
Common Ground Station/Ground Station Module	The first digitized corps will require about 25 Common Ground Stations; production of all 100 Common Ground stations is scheduled to end in 2001. An enhanced version of the Common Ground Station, which shares data with the Army Tactical Command and Control System, is scheduled to participate in the April 2001 Division Capstone Exercise.
Contact Maintenance Truck	Fielding of the Contact Maintenance Truck to the first digitized corps is expected to be completed by September 2000.
Digital Topographic Support System	The objective fielding configuration is the Digital Topographic Support System-Light on a single high-mobility, multipurpose, wheeled vehicle. Fielding to the first digitized corps is scheduled for completion by the end of 2004.
Firefinder	A new software version (12) for the Firefinder radar system is scheduled to be tested at the end of fiscal year 2000. Firefinder hardware is on schedule for the first digitized division and corps.
Integrated Meteorological System	The Integrated Meteorological System with Army Battle Command System software version 4.3 is being fielded throughout the Army. The objective Category 2 fielding goal is to field the system with Army Battle Command System version 6.0. The first operational assessment of this configuration is scheduled for the Division Capstone Exercise in April 2001.
M93A1 Fox	While the fielding of 20 M93A1 Nuclear, Biological, and Chemical Reconaissance Systems to most III Corps units was completed in June 1999, another 8 units are scheduled for fielding to III Corps in December 2002.
OH-58D Kiowa Warrior	The Army plans to upgrade the OH-58 A and C versions to D versions through a Safety Enhancement Program. Aircraft fielded to III Corps units will have limited digital capability. This will be upgraded in a two-phase effort to provide full aviation messaging capability for the first digitized corps by 2004.
Paladin	Paladin is already fielded to III Corps units. However, an improvement program is under way to integrate a Force XXI Battle Command, Brigade and Below capability into the platform. The integration effort will be evaluated at the Division Capstone Exercise in April 2001 and the Force XXI Battle Command, Brigade and Below initial operational test and evaluation in November 2001.

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System	Fielding status
Palletized Loading System-Enhanced Movement Tracking System	The system is scheduled to be fielded to most III Corps units in fiscal year 2001.
Standard Installation/Division Personnel System 3	The system is scheduled for fielding to III Corps units by June 2000.
Tactical Operations Centers	Fielding to the first digitized corps is expected to be completed by 2004. The Centers being fielded include the Aviation Tactical Operations Center, which was identified as a separate system on the Training and Doctrine Command's list of Category 2 systems.

Note: The Digital Topographic Support System and the Integrated Meteorological System need to demonstrate that interoperability objectives have been met. This issue is discussed later in the report.

Source: Data provided by Army program management officials.

About Half of the Category 2 Systems May Not Be Ready by 2004

Our analysis of the current acquisition status of 56 Category 2 systems indicates that as many as half of the systems may not be ready for fielding by the end of 2004. We have identified three main causes. First, the development schedules for eight systems fall somewhere between the likely to be ready and not ready categories. The systems could be available; if the acquisition schedule is delayed, they will likely not be ready. Second, over a dozen Category 2 systems require operational testing before they are scheduled for production and fielding. Since the outcome of operational testing is unknown at this point, it is uncertain whether these systems will be fielded as scheduled. Third, three Category 2 systems need to demonstrate that they can share data automatically with critical Army command and control systems. This interoperability among systems is key to maximizing the potential of digitization.

Schedule Data Indicate Eight Systems May Not Be Ready for Fielding

Given the development schedules of eight Category 2 systems, it is still too early to tell whether the systems can be fielded to all III Corps units by the end of 2004. For example, the Prophet Ground Program has replaced the Ground-Based Common Sensor-Heavy Program. Prophet Ground is scheduled for initial operational testing early in fiscal year 2004 and for production in fiscal years 2004 and 2005. As a result, the Army is not sure that this system can be fielded by 2004.

Table 4 discusses the acquisition status of the Category 2 systems that may or may not be fielded to all III Corps units by the end of 2004.

Table 4: Acquisition Status of Category 2 Systems That May Not Be Available by 2004

System	Acquisition status
Airborne Communications Node	The Army is supporting a high-capacity, line-of-sight radio relay during an unmanned aerial vehicle flight demonstration in September 2001. The needs for the ground link to the Airborne Communications Node are being studied. Since the Army is still exploring the concept of an airborne communications node, no production schedules or fielding plans have yet been established.
Battle Command Vehicle	The vehicle was developed for use during the Task Force XXI Advanced Warfighting Experiment in 1997. The program is still in the concept exploration phase and has no budget, milestones, or fielding plans.
Ground-Based Common Sensor-Heavy/Prophet Ground	The Prophet Ground program has replaced the Ground-Based Common Sensor-Heavy program. Prophet Ground is scheduled for initial operational testing early in fiscal year 2004 and production in fiscal years 2004 and 2005. As a result, III Corps units may or may not receive the system in 2004.
Joint Tactical Radio System	The Joint Tactical Radio System is described as the Department of Defense radio of the future. Prototype radios are being designed. The 4th Infantry Division has received the Army Near-Term Data Radio, a Category 1 system. The 1st Cavalry Division is scheduled to receive the Joint Tactical Radio System, if available, in fiscal year 2003.
Joint Warning and Reporting Network	All Joint Warning and Reporting Network fielding dates depend on the release of Army Battle Command System software, version 6.1. Fieldings for various phases of the system are scheduled in fiscal years 2000, 2002, and 2004. If the Army Battle Command software is delayed, fielding to the first digitized corps could also be delayed and extend beyond 2004.
Land Warrior	Fielding is scheduled to begin in 2004 at the earliest.
Personal Communications System	The overall objective of this program is to develop commercially available wireless cellular telephone technology for secure mobile satellite services and terrestrial applications. There is no validated requirement or funding for this system.
Smart Cards	The Smart Cards system is not scheduled to be fielded until 2004 at the earliest.

Note: To explore new concepts, such as use of the Battle Command Vehicle, the Army acquired and installed sufficient quantities of new equipment to field a brigade-sized experimental force in June 1996. The experimental force used the equipment in an Advanced Warfighting Experiment, which culminated in March 1997 during a 2-week deployment to the National Training Center at Fort Irwin, California.

Source: Data provided by Army program management officials.

Eighteen Systems Must Undergo Operational Testing

Eighteen of the Category 2 systems must still undergo operational testing. The unknown outcome of operational testing and the potential introduction of schedule delays cause a degree of fielding uncertainty. For example, the M1A2 Abrams tank, with system enhancements (a Category 2 system), was scheduled for a follow-on operational test and evaluation in July 1999. Mainly as a result of an unsuccessful effort to embed Force XXI Battle Command, Brigade and Below software into the tank's data processing system, the follow-on test and evaluation has been rescheduled for October 2000.

Table 5 identifies the Category 2 systems that must undergo operational test and evaluation before production and fielding plans can be finalized.

Table 5: Category 2 Systems With Scheduled Operational Tests

System	Operational test event	Scheduled time frame
Aviation Mission Planning System	Initial operational test and evaluation	2nd quarter fiscal year 2000
Battlefield Combat Identification System	Initial operational test and evaluation	3rd quarter fiscal year 2001
Bradley Fire Support Team Vehicle (M7)[a]	Initial operational test and evaluation	3rd quarter fiscal year 2000
Defense Message System/Tactical Message System	Initial operational test and evaluation	2nd quarter fiscal year 2001
Global Combat Support System – Army	Module testing	Fiscal years 2000-2003
Lightweight Laser Designator Rangefinder	Initial operational test and evaluation	1st quarter fiscal year 2001
Long-Range Advanced Scout Surveillance System	Follow-on operational test and evaluation	3rd quarter fiscal year 2001
M1A2 Abrams Tank with system enhancements	Follow-on operational test and evaluation	1st quarter fiscal year 2001
M2A3 Bradley Fighting Vehicle	Initial operational test and evaluation	1st quarter fiscal year 2001
Medical Communications for Combat Casualty Care/Joint Theater Medical Information Program	Initial operational test and evaluation	1st quarter fiscal year 2001
Mobile Integrated Tactical Terminal/Division Tactical Exploitation System	Initial operational test and evaluation	2nd quarter fiscal year 2002
Mortar Fire Control System	Initial operational test and evaluation	4th quarter fiscal year 2001
Multiple Launch Rocket System (M270A1)	Initial operational test and evaluation	3rd quarter fiscal year 2001
Radio Frequency Tags	As part of Global Combat Support System-Army operational test and evaluation	1st quarter fiscal year 2001
Striker (M707)	Initial operational test and evaluation	3rd quarter fiscal year 2000
Tactical Airspace Integration System	Initial operational test and evaluation	3rd quarter fiscal year 2001
Tactical Unmanned Aerial Vehicle	Initial operational test and evaluation	3rd quarter fiscal year 2001
Transportation Coordinators Automated Information for Movement System II	Initial operational test and evaluation	4th quarter fiscal year 2000

Notes: Even if the Bradley Fire Support Team Vehicle and the Striker successfully complete their initial operational test and evaluation, these systems are not scheduled to be available to all III Corps units

by the end of 2004. As discussed later in this report, the Tactical Airspace Integration System also needs to demonstrate that interoperability objectives have been met.

[a]Test schedule may slip due to inadequate funding for testing.

Source: Data provided by Army program management officials.

Three Systems Need to Demonstrate Interoperability

Three Category 2 systems and five Category 1 systems[5] making up the Army Tactical Command and Control System, need to demonstrate that they can share data automatically through a common database. Two of the Category 2 systems—the Digital Topographic Support System and the Integrated Meteorological System—are presently being fielded, and the third—the Tactical Airspace Integration System—is still under development. While the systems can be fielded individually, the benefits of digitization will not be optimized until they can share data through a common database.

At present, when a change is made to an individual system's database, component systems' databases are not automatically updated. Instead, the updates are done manually, either through inputs to other related databases or through an electronic message to the databases. For example, if the Integrated Meteorological System database is changed to show new weather information, the change would have to be manually entered or done through a message to the Digital Topographic Support System or Tactical Airspace Integration System databases.

The Army intends to automate database updates and database sharing with the development and fielding of a software package called the Army Battle Command System software. It is developing a new version of the system software (designated version 6.0), which will be followed by version 6.1 for use in September 2000, version 6.2 for use in April and November 2001, and version 7.0, which is scheduled to be fielded throughout the Army. However, Army officials stated that problems associated with version 6.0 place all of these scheduled events in jeopardy. Until these three Category 2 systems demonstrate interoperability, the Army cannot exploit the full potential of the Army Tactical Command and Control System.

[5] The five Category 1 systems are the All Source Analysis System, Advanced Field Artillery Tactical Data System, Combat Service Support Control System, Forward Area Air Defense Command and Control System, and Maneuver Control System.

Twelve Systems Will Not Be Available by 2004

Our analysis of the current acquisition status of the 56 Category 2 systems indicates that 12 of the systems will not be ready for fielding by the Army's milestone, the end of 2004. We have identified two main causes. First, the Army's medium-weight force initiative led to the termination and restructure of six Category 2 systems. Second, the development schedule for six systems indicates that even if they progress as currently scheduled, they will not be ready for fielding by 2004.

Medium-Weight Force Initiative Led to the Termination and Restructure of Six Systems

To fund or otherwise support the medium-weight force initiative, the Deputy Secretary of Defense made a program budget decision[6] that resulted in adjustments to dozens of Army programs during fiscal years 2001-2005. For example, the decision provided for funding in fiscal years 2000 and 2001 to establish two initial brigades at Fort Lewis, Washington, and it increased funding for the development of a family of Future Combat System vehicles to replace a portion of the current tank force. The decision also resulted in the restructure of three Army programs and the termination of six others. The three restructured programs and three of the six terminated programs are Category 2 digitization systems.

The three restructured digitization programs are the Crusader self-propelled howitzer, the Future Scout and Cavalry System, and the Prophet Air intelligence/electronic warfare system. All will require more development time before they are ready for production and fielding. None of the systems will be available to III Corps units by the 2004 digitization fielding milestone.

The three terminated Category 2 programs are the Command and Control Vehicle, the Grizzly Engineer Vehicle, and the Wolverine Heavy Assault Bridge. Since Grizzly and Wolverine were identified as the solutions to serious engineering equipment deficiencies 9 years ago, after Operation Desert Storm, officials at the 4th Infantry Division told us that loss of Grizzly and Wolverine posed a significant drawback to the achievement of their operational performance goals. This is because obsolete engineer equipment was ranked among the top five problems for that operation. According to the 4th Infantry Division officials, termination of the program adversely affects operational performance. That is (1) without the Grizzly Engineering Vehicle, combat power is reduced because one third of the

[6] A program budget decision is the budgeting mechanism used by the Office of the Secretary of Defense to adjust the budget submissions from the services.

main battle tanks must be used as mine rollers and mine plows and (2) lacking the Wolverine, the momentum of operations will be reduced because the Abrams tanks and Bradley Fighting Vehicles will have to rely on an old bridge system.

Six Category 2 Systems Will Not Be Ready Because Development Schedules Are Inconsistent With Fielding by the End of 2004

The development schedules for six other Category 2 systems are not consistent with the 2004 fielding milestone. Table 6 discusses the Category 2 systems that will not be fielded to all III Corps units by the end of 2004 and their schedules for fielding.

Table 6: Category 2 Systems Not Available by 2004

System	Fielding schedule
Army Airborne Command and Control System	The system is to be fielded to the 1st Cavalry Division in 2005 and to III Corps in 2006.
Palletized Load System-Enhanced-Driver Viewer Enhanced	Funding is not expected to be available until fiscal year 2006 at the earliest.
Raptor Intelligent Combat Outpost System	Fielding is scheduled to begin in fiscal year 2007.
RAH-66 Comanche	Fielding to III Corps is scheduled to begin in 2005 with the delivery of eight aircraft to the 1st Cavalry Division.
Tactical Interactive Ground Equipment	This concept has not yet matured beyond the planning phase because of concerns about the amount of bandwidth needed for continuous real-time updates.
Wireless Local Area Network	Two wireless local area networks for Tactical Operations Centers are scheduled for delivery to the 4th Infantry Division in June 2000 for experimentation. Operational systems will not be available before 2004.

Source: Army program management officials.

Assumed Benefits of Digitization Prompt Continuing Structural Change

The Army has already made and is continuing to make decisions on structural changes based in part on the capabilities to be derived from digitization, including those from Category 2 systems, even though the battlefield systems involved are still being developed and tested. For example, the Army has changed the composition of the 4th Infantry Division because it expects that digitization will reduce the number of soldiers needed to fulfill missions. This redesign has resulted in the elimination of entire units, a reduction of major fighting platforms (Abrams tanks and Bradley Fighting Vehicles), and a decrease in the number of soldiers within the division from 18,069 to 15,719. In addition, the Division's expected area of operations has grown from 10,000 square kilometers to 24,000 square kilometers on the basis of the capabilities expected from digitization. A comparable redesign of III Corps units is under way; it is

likely that the redesign will assume the availability of individual Category 2 systems.

Conclusions

Although the Army plans to field as many Category 2 systems that are available by the end of 2004 to the first digitized corps, many of the 56 Category 2 systems may not be available for fielding. Only 18 of the systems, or about 30 percent, are already fielded or will be fielded by 2004, 26 systems may not be ready based on their development and production schedules, and 12 will not be ready for various reasons, including the fact that some systems have already been canceled. Yet, Army officials continue to base decisions on the expected benefits of digitization, generally on the assumption that most of the 56 Category 2 systems will be ready for fielding by the end of 2004. Such decision-making is hampered by the absence of a comprehensive analysis of where individual Category 2 systems stand regarding the projected end of the 2004 milestone and how each contributes to digitization goals. Without such an analysis, decisionmakers do not have a complete view of the impact other decisions, such as the termination of the Grizzly Engineering Vehicle and Wolverine Heavy Assault Bridge programs, might have on its digitization goals.

Recommendation

To provide decisionmakers within the Army with a detailed understanding of the impact the availability of Category 2 systems will have on other decisions, we recommend that the Secretary of the Army direct the preparation of an annual acquisition status report that identifies (1) when each Category 2 system is expected to be fielded and (2) alternative fielding strategies focused on the successful establishment of the first digitized corps by the end of 2004.

Agency Comments

In written comments on a draft of this report, DOD agreed with the findings of the report and concurred with our recommendation. In its comments, DOD stated that it supports increased efforts to track the acquisition status of the Army's Category 2 systems as we recommended. In this regard, the Army has agreed to include the acquisition status of the Category 2 systems with its recurring Brigade Set Fielding reporting process. The Army believes this reporting concept will obviate the need for an additional report to meet this new requirement. We believe this approach will satisfy the intent of our recommendation. DOD's comments are printed in their entirety in appendix II.

Scope and Methodology

To determine the acquisition status of the Category 2 systems and to identify any cost or schedule uncertainties that could confront the Army when its first digitized corps is fielded, we began by reviewing the objectives of the Army XXI and Army After Next initiatives, the fielding plans for III Corps units, and individual system cost and schedule data. We obtained briefings from program managers, testers, and users. We also analyzed the acquisition strategy of each Category 2 program, critical program milestones, and the relationship between critical program milestones and fielding plans for the first digitized corps. We used an August 1999 listing of 56 Category 2 systems as the starting point for our analysis; we met with Training and Doctrine Command officials in September 1999, and they confirmed that the list was accurate. In May 2000, during our exit conference, Army officials informed us that there had been some minor changes to the Category 2 systems listing we used throughout the assignment. For example, the Tactical Interactive Ground Equipment and Wireless Local Area Network were no longer considered Category 2 systems. Since these changes did not materially alter our results, we decided to report on the 56 Category 2 systems we used as the starting point for our analysis.

We also reviewed the test and evaluation schedules of each Category 2 system. We then compared these schedules with the fielding schedule for the first digitized corps. We also analyzed the impact of the medium-weight force initiative on the digitization initiative. We reviewed the overall objectives of major digitization validation events, including Army Tactical Command and Control System interoperability objectives, and plans to use new and upgraded versions of communication equipment, weapons platforms (including Abrams tanks and Bradley Fighting Vehicles with embedded Force XXI Battle Command, Brigade and Below software), and tactical operations centers during the tests and exercises. We reviewed the revised Army test and evaluation plan for the Force XXI Battle Command, Brigade and Below system.

In the course of our work, we interviewed program officials and examined program management and budget documents, system requirements, test plans, acquisition plans, and other program documentation. We performed our work primarily at the Army Digitization Office, Arlington, Virginia; the Army Tank-automotive and Armaments Command, Warren, Michigan; the Army Communications and Electronics Command, Fort Monmouth, New Jersey; the Army Aviation and Missile Command, Redstone Arsenal, Alabama; and program management offices located at Picatinny Arsenal,

New Jersey, Edgewood Arsenal, Maryland, and Fort Belvoir, Virginia. We also gathered data from the Director, Operational Test and Evaluation, Arlington, Virginia; the Army Training and Doctrine Command, Norfolk, Virginia; the Army Test and Evaluation Command, Alexandria, Virginia; and the III Corps, 4th Infantry Division, 1st Cavalry Division, Fort Hood, Texas.

We performed our review from August 1999 to March 2000 in accordance with generally accepted government auditing standards.

We are sending copies of this report to Representative John P. Murtha, Ranking Minority Member of the Subcommittee; Representative C.W. Bill Young, Chairman, and Representative David R. Obey, Ranking Minority Member, House Committee on Appropriations; and other interested congressional committees. We are also sending copies of this report to the Honorable William S. Cohen, Secretary of Defense; the Honorable Louis Caldera, Secretary of the Army; and General James L. Jones, Commandant of the Marine Corps. Copies will also be made available to others upon request.

If you have any questions regarding this report, please contact Charles F. Rey at (202) 512-4174 or Paul G. Williams at (617) 565-7468. Key contributors to this report were Robert J. Dziekiewicz and Subrata Ghoshroy.

Sincerely yours,

Allen Li
Associate Director
Defense Acquisitions Issues

Fiscal Years 2001 and 2002 Funding Estimates for Category 2 Systems

Acquisition status and purpose of Category 2 systems	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
	Research and development	Procurement	Research and development	Procurement
1. The Army Airborne Command and Control System (A2C2S) is a helicopter-hosted (UH-60 Black Hawk) command and control system that will serve as a highly mobile command post for corps, division, or maneuver brigade commanders. The commanders will be provided voice and data equipment equivalent to a tactical command post or battle command vehicle. The system is still in the engineering and manufacturing development phase. An initial operational test and evaluation is scheduled for April 2002. The second digitized division (1st Cavalry Division) is scheduled to be fielded in fiscal year 2005 and the first digitized corps in fiscal year 2006.	$16.5	0	$9.2	$26.2
2. The Analysis Control Team (ACT) Enclave mainly consists of two All Source Analysis System (ASAS) remote workstations in a communications shelter mounted on a high-mobility, multipurpose wheeled vehicle. The ACT Enclave allows the brigade combat team to integrate, process, and interpret near real-time sensor and broadcast reports from remote intelligence sources via a common ground station and to merge the information with the brigade's organic reconnaissance. The ACT will be located at the brigade level. The remote workstation has already completed operational testing and all first digitized division ACT Enclave units should be fielded by the end of 2000.	0	$25.9	0	12.1
3. The Airborne Communications Node (ACN) is a Defense Advanced Research Projects Agency demonstration project that is intended to package a communications link on an airborne platform. Expected benefits include a beyond line-of-sight communications capability, command and control "on the move," and communications in areas that cannot accommodate fixed Warfighter Information Network (WIN) equipment. The Army, through its WIN-Terrestrial program, has agreed to support a High-Capacity Line-of-Sight radio relay during the Phase II Unmanned Aerial Vehicle (UAV) flight demonstration in September 2001. The needs for the ground link to the ACN are currently being studied. (Note: the indicated funding for fiscal year 2002 is for Information Integration Systems, which includes ACN. The comparable figure for fiscal year 2001 is $49.7 million.)	12.5	0	38.1	0

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Acquisition status and purpose of Category 2 systems	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
	Research and development	Procurement	Research and development	Procurement
4. The Apache Longbow (AH-64D) is a two-crew member, tandem cockpit-configured aircraft that incorporates major improvements and upgrades to the earlier AH-64A version. The Longbow Weapon System will provide automatic target detection, classification, prioritization, and a fire-and-forget engagement capability, greatly increasing weapon system effectiveness and aircraft survivability. AH-64D fielding to the first digitized corps is scheduled to be completed by May 2004. However, the improved data modem, which performs as aviation's Internet controller and tactical Internet, will have limited command and control and situational awareness capabilities in version 5.0 at the Division Capstone Exercise in April 2001. Version 5.1 is expected to have full capabilities.	17.4	621.2	38.4	748.4
5. The Aviation Mission Planning System (AMPS) is a mission planning/battle-synchronization tool that automates aviation mission planning tasks, including route generation, performance planning, communications planning, terrain analysis, data transfer, and mission rehearsal. It will provide connectivity to the Army Tactical Command and Control Systems, transfer mission planning data to aircraft, and disseminates maps to the platforms. An initial operational test and evaluation is currently scheduled for February 2001. However, AMPS has been widely fielded in support of Army aviation, and fieldings to the digitized units are well in advance of the overall Army timeline.	0	9.0	0	7.1
6. The Advanced Quick Fix (AQF) is also known as Prophet-Air. The Prophet components (air, ground, and control) are intended to electronically map the battlefield by detecting, identifying, locating, and tracking radio frequency emitters and then graphically depicting these emitters. Originally, the AQF sensor was to have been placed on a helicopter, as was the Quickfix (AN/ALQ-151) sensor package. The airborne platform has changed and will now be a dedicated UAV. Although Prophet Air is listed as a "program termination" in the Program Budget Decision (PBD) 745 narrative, it appears to be a restructure with a shift in the acquisition phase from engineering and manufacturing development to demonstration/validation. The Prophet Air schedule now shows an engineering and manufacturing development milestone decision in fiscal year 2003 and a production milestone III decision at the end of fiscal year 2005.	7.0	0	8.0	0

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
7. The Avenger Slew-to-Cue (STC) is an upgrade to the Avenger, a lightweight, highly mobile and transportable surface-to-air missile and machine gun system that includes Stinger missiles and a .50 caliber machine gun mounted on a heavy high mobility multipurpose wheeled vehicle (HMMWV). Its mission is short-range air defense for division and corps. It is designed for stationary or shoot-on-the-move defense against UAVs, cruise missiles, helicopters, and fixed-wing aircraft in all weather conditions. The STC upgrade accepts data from the Forward Area Air Defense Command, Control and Intelligence System (FAADC2I) and automatically moves the Avenger turret, placing targets in the gunner's field of view. Fielding of Avenger STC to the first digitized corps is expected to be completed by fiscal year 2002.	0	6.8	2.0	9.4
8. The Aviation Tactical Operations Center (AVTOC) is included in the Tactical Operations Center summary.	0	0	0	0
9. The Battlefield Combat Identification System (BCIS) is a millimeter wave "question and answer system" intended to provide a high probability (greater than 95 percent) of identifying friendly platforms on the battlefield so that fratricide rates can be reduced. A low-rate initial production contract was awarded in December 1999. An initial operational test and evaluation is scheduled for the third quarter of fiscal year 2001. A full-rate production decision is scheduled for the second quarter of fiscal year 2002.	2.4	18.8	0	18.8
10. The Battle Command Vehicle was developed for use during the Task Force XXI Advanced Warfighting Experiment in 1997. It is a command and control vehicle (Bradley derivative) improved with additional radios, Applique, Mobile Subscriber Equipment, Maneuver Control System, two additional computer workstations, and a 21-inch flat panel display. The purpose of the vehicle is to facilitate command and control at the brigade and battalion levels. The program appears to still be in the concept exploration phase; we could not identify any budget, milestones, or fielding plans.	0	0	0	0

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
11. The Bradley Fire Support Team (BFIST) Vehicle provides enhanced surveillance, target acquisition, and target tracking information for use by field artillery assets. There are two BFIST models: the M7 BFIST is based on the Bradley A2 Operation Desert Storm chassis and the A3 BFIST is based on the Bradley A3 chassis. An initial operational test and evaluation of the M7 BFIST vehicle is scheduled for Fort Stewart from January through May 2000; however, the funding for the initial operational test and evaluation is questionable. The initial operational test and evaluation may have to be delayed. M7 BFIST vehicles are scheduled to be fielded to the 1st Cavalry Division and the 3rd Armored Cavalry Regiment by the end of fiscal year 2004, but the 4th Infantry Division is not scheduled to receive its A3 BFISTS until 2005. The initial fielding of the M7 BFIST vehicles will be to the 3rd Infantry Division at Fort Stewart.	2.2	28.5	0	32.0
12. The Command and Control Vehicle is an armored vehicle intended to ensure a mobile, responsive, survivable command and control capability for the heavy force. The program has been canceled through PBD 745.	0	0	0	0
13. The Common Ground Station/Ground Station Module (CGS/GSM) receives and displays data from a variety of sources, including Joint STARS, the Hunter UAV, satellite intelligence broadcast reports, and the Apache Longbow. Operationally, the Analysis Control Team within a tactical operations center analyzes CGS data and other intelligence data to provide commanders with an integrated "red picture" of the battlefield. The first digitized corps will require about 25 CGSs; the last contract award date, which will complete the buy of 100 CGSs for the Army is scheduled for fiscal year 2001. A program executive officer development initiative is endeavoring to export the CGS's Joint STARS "live overlay" into the Army Tactical Command and Control System (ATCCS) Joint Common Database, and export Joint Common Database products to the CGS. The CGS is scheduled to participate in the April 2001 Division Capstone Exercise.	13.4	72.1	11.4	27.8
14. The Contact Maintenance Truck (CMT) is a self-contained, multicapable light repair system in an enclosure, mounted on a heavy HMMWV chassis. It performs organizational to direct support level repair for wheeled vehicles and equipment. The CMT is a nondevelopment item. Fielding to the III Corps units is scheduled for completion by September 2000. No Force XXI Battle Command, Brigade and Below (FBCB2) capability is currently scheduled for this vehicle, but it will have a Global Positioning System receiver on the vehicle dash.	0	9.7	0	9.9

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
15. The Crusader weapon system is a 155-mm self-propelled howitzer and resupply vehicle that will support the maneuver force for Army XXI and Army After Next. The 1999 schedule showed an engineering and manufacturing development (EMD) milestone decision in the second quarter of fiscal year 2001 and a full-rate production decision in the first quarter of fiscal year 2006. The first unit was to have been fielded in 2005. However, PBD 745 provided for a major restructure of the program. EMD is now scheduled for fiscal year 2003, low-rate initial production in 2006, and the first unit equipped in 2008.	355.5	0	446.9	0
16. The mission of the Defense Message System (DMS) is to integrate a modernized command and control messaging capability, including joint and coalition interoperability, for all Department of Defense (DOD) locations. The Defense Information Systems Agency (DISA) is the responsible executive agent for developing the system. The Army segment of DMS is intended to provide global messaging for the Army from the battlefield to the sustaining base. While DMS has been at Fort Hood units since 1997, a DMS subsystem, the Tactical Message System, is scheduled to undergo an initial operational test and evaluation in the second quarter of fiscal year 2001.	0	18.8	0	19.8
17. The Digital Topographic Support System (DTSS) automates terrain analysis and will provide digital maps and updates to commanders and weapon platforms in support of mission planning, rehearsal, and execution. The objective fielding configuration is the DTSS-Light on a single HMMWV. The DTSS-Light was type classified in January 1998. Fielding to first digitized corps units is scheduled for completion by the end of fiscal year 2004.	0	20.0	0	4.5
18. The Future Scout and Cavalry System (FSCS) will replace the current ground scout systems in the platoon, company, battalion, brigade, and division levels. FSCS will conduct continuous, all-weather, area, zone, and route reconnaissance to provide real-time, man-in-the-loop intelligence to the tactical commander. PBD 745 provides for a restructuring of the FSCS program and essentially removes funding for the engineering and manufacturing development phase from fiscal year 2002 onward. (Note: funding indicated for fiscal year 2002 is for Advanced Combat Vehicle Technology, which includes FSCS. The comparable figure for fiscal year 2001 is $104.7 million.)	68.9	0	72.4	0

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
19. Firefinder is a phased-array radar that tracks incoming and outgoing artillery, rockets, missiles, and mortars. Data is sent to the Fire Detection Center which, in turn, is linked via the Advanced Field Artillery Tactical Data System (AFATDS) to counter-fire batteries. A new software version (12) is scheduled to be tested at the end of fiscal year 2000. Firefinder hardware is on schedule and within budget for the first digitized division and corps.	37.4	18.5	26.8	30.4
20. The Ground-Based Common Sensor-Heavy (GBCS-H) is evolving to the Prophet-Ground HMMWV-based system. The Prophet components (air, ground, and control) are intended to electronically map the battlefield by detecting, identifying, locating, and tracking radio-frequency emitters and then graphically depicting these emitters. Prophet-Ground is intended to have on-the-move direction finding and signals exploitation capabilities. Prophet-Ground will replace the fielded Trailblazer system. Prophet-Ground is scheduled for initial operational test and evaluation early in fiscal year 2004 and production in fiscal years 2004 and 2005. The Army has not yet established the fielding priorities.	0	4.9	0	4.9
21. The Grizzly (M1 Breacher) Engineering Vehicle is an armored combat support system designed to integrate countermine and counterobstacle capabilities into a single survivable system. The program has been canceled through PBD 745.	0	0	0	0
22. The Global Combat Support System–Army (GCSS-A) supports the Combat Service Support functions of manning, fixing, fueling, moving, and sustaining soldiers and their systems. The GCSS-A is being fielded through the introduction of various product line modules: supply/property, maintenance, integrated material management, management, supply support activity, and ammunition. Each module requires operational testing and will be fielded between fiscal year 2000 and 2003. Units at Fort Hood will be among the first to receive each module after the completion of its respective operational test.	74.4	30.0	94.9	52.1

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
23. The Integrated Meteorological System (IMETS) is a mobile, tactical automated weather data receiving, processing, and dissemination system. The Army acquires the units and uses the data, but the systems are actually staffed with Air Force personnel; the Air Force develops global weather data from Offut Air Force Base, Nebraska. IMETS with Army Battle Command System (ABCS) software version 4.3 is being fielded throughout the Army. The goal of the "Category 2 IMETS" is to integrate IMETS with ABCS version 6.0. The first operational assessment of "IMETS/ABCS 6.0" will be at the Division Capstone Exercise scheduled for April 2001.	1.8	7.0	1.9	2.5
24. The Raptor Intelligent Combat Outpost (ICO) is a suite of munitions, sensors, communication systems, and software that enable the commander to protect the battlespace. It is envisioned that it will consist of four components: air deliverable acoustic sensors, an artificial intelligence platform (the gateway), a ground control station, and an attack munition. Raptor is scheduled to be developed in two phases: Phase One Core Raptor, will be capable of completing the user threshold requirements and Phase Two, Ultimate Raptor, will fulfill the user's objective requirements. Raptor is currently in the concept exploration phase of the acquisition cycle. The first unit is scheduled to be equipped for Core Raptor in fiscal year 2007.	12.8	0	11.4	0
25. The overall intent of the Joint Tactical Radio System (JTRS) initiative is to develop a family of affordable, high-capacity tactical radios to provide both line-of-sight and beyond line-of-sight communications capabilities to the warfighters. JTRS is described as the DOD radio of the future and has the goal of migrating today's legacy systems to systems compliant with the JTRS architecture. Recently, the JTRS joint program office issued a broad agency announcement to acquire prototype radios designed to provide a secure data networking capability between mobile users, such as tactical operations centers, for the dissemination of data from command and control systems operating throughout all echelons and major subordinate units from division to battalion levels. A selection of one or more industry designs for the prototype radios was expected by the end of February 2000. The production radios will be used by the first digitized corps to achieve a Near-Term Data Radio (NTDR) equivalent capability. NTDRs are being fielded to the first digitized division only.	90.7	0	159.3	0

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Acquisition status and purpose of Category 2 systems	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
	Research and development	Procurement	Research and development	Procurement
26. The Joint Warning and Reporting Network (JWARN) integrates nuclear, biological, and chemical (NBC) warning, reporting, analysis, and response software with NBC sensors to minimize the effects of hostile NBC attacks or accidents/incidents. The Marine Corps is the lead service for the joint program. JWARN will be fielded in phases, with phase I scheduled for the fourth quarter of fiscal year 2000. Phase I involves integration with the Maneuver Control System and the ABCS software. All JWARN schedule dates depend on the release of ABCS version 6.1. Phase II is scheduled for fielding in fiscal year 2003. It is not clear which fielding is the objective fielding for the first digitized corps.	7.3	9.0	7.3	11.7
27. The Land Warrior System is intended to significantly improve the lethality, mobility, survivability, command and control, and sustainability of infantry soldiers by integrating a variety of components and technologies. Land Warrior includes a computer/radio, software, integrated headgear, including an imaging display, weapon subsystem, and protective clothing and equipment to be integrated on the individual soldier. The development program was recently restructured, and Land Warrior production is not scheduled to begin until fiscal year 2004, at the earliest.	60.1	0	36.4	0
28. Linebacker is a Bradley derivative system that contributes to the forward area air defense mission for heavy forces by being able to fire Stinger missiles and a 25-mm automatic cannon at fixed and rotary wing targets. Production of the 99 Linebackers has ended, and fielding to heavy forces, III Corps units and 3rd Infantry Division is essentially complete.	0	0	0	0
29. The Lightweight Laser Designator Rangefinder (LLDR) is a man-portable laser designator and target locator with eye-safe range finding, azimuth determination, self-location, and data/image export capability. It can locate targets in day or night with all-weather capability. According to the Army, LLDR meets an urgent need for precision target location and engagement for the artillery fire support teams. The LLDR program received Warfighter Rapid Acquisition Program funding in fiscal years 1997 and 1998 to achieve an initial operational capability and for integration into the Striker in a vehicle-mounted configuration. LLDR will also serve as the sensor and digital data source for the Marine Corps fire support teams. It is a Joint Army/Marine Corps effort. The Army has a requirement of 1,184 systems and the Marine Corps of 394 systems. An operational test is scheduled for November/December 2000.	0	7.1	0.9	7.0

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
30. The Long Range Advanced Scout Surveillance System (LRAS3) will provide armor and mechanized infantry battalion scout platoons with long-range target acquisition and far-target location capabilities, enabling them to conduct reconnaissance and surveillance missions beyond the effective range of enemy direct fire weapons. It will operate line-of-sight and provide real-time acquisition, target detection, recognition, and location information to the operator, in "around the clock" combat operations in both mounted and man-portable configurations. Operational testing found the system to be both "not effective" and "not suitable" due to intermittent loss of far target location capability. A limited user test is scheduled for the fourth quarter of fiscal year 2000 to verify improvements since the initial operational test and evaluation. The follow-on operational testing and evaluation and the first unit equipped are scheduled for the third and the fourth quarters, respectively, of fiscal year 2001.	1.5	46.2	0.8	44.4
31. The start of the M1A2 Abrams tank with system enhancements follow-on operational test and evaluation (FOT&E) has been delayed about 18 months (April 1999 to October 2000), mainly because of the inability to integrate the Force XXI Battle Command, Brigade and Below (FBCB2) Embedded Battle Command (EBC) software into the platform. The EBC effort has been replaced by the Integrated Combat Command and Control (IC3) initiative that will have the FBCB2 software hosted on a separate processor (an Intel card), but share the same display and input device. Four System Enhancement Program (SEP) tanks will participate in the FOT&E; 90 SEP tanks will participate in the Division Capstone Exercise, scheduled for April 2001.	82.7	549.0	90.6	638.9
32. The start of the M2/M3A3 Bradley Fighting Vehicle's (M2 is the Infantry vehicle, M3 is the Cavalry vehicle) initial operational test and evaluation has been delayed about 18 months (April 1999 to October 2000), mainly because of the inability to integrate the FBCB2 EBC software into the platform. The EBC effort has been replaced by the Abrams-led Integrated Combat Command and Control (IC3) initiative that will have the FBCB2 software hosted on a separate processor (an Intel card), but share the same display and input device. However, FBCB2 Appliques will be used during the initial operational test and evaluation and the Division Capstone Exercise.	0	388.8	0	389.3

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
33. The M93A1 Fox is a Nuclear, Biological, and Chemical Reconnaissance System (NBCRS) enclosed within a wheeled, lightly armored vehicle. The vehicle finds, identifies, maps, and marks NBC contamination on the battlefield. The system completed operational testing in October 1998; interoperability with the Maneuver Control System was included in the operational testing. Fielding to Fort Hood units (20 systems) was completed in June 1999; however, an additional eight units are scheduled to be fielded to III Corps in December 2002.	0	31.6	0	6.3
34. Smart Cards is part of the Automated Identification Technology (AIT) to provide state-of-the-art technologies that offer rapid and accurate data capture retrieval and transmission. The technology includes various radio frequency barcode-scanning devices and various data carrier devices with associated readers and writers. The data carrier devices include integrated circuit chip cards (smart card) in the size and shape of an ID card, which allows for the ease of storage for documents and data, and facilitates security as well. It can be used for, among others, personnel and finance records, electronic cash, deployability/wellness etc. The card is now being tested in the 25th Infantry Division for food service, immunization, dental fitness, etc. (Note: The indicated funding amount is for AIT and not exclusively for Smart Cards.)	0	1.8	0	0
35. The Medical Communications for Combat Casualty Care (MC4) is intended to provide the Army an information technology infrastructure to support the tactical medical mission interface with the Joint Theater Medical Information Program (TMIP) software. The progress of the MC4 system is dependent upon the TMIP software; TMIP is an acquisition category ID program. TMIP has an initial operational test and evaluation scheduled for the first quarter of fiscal year 2001.	3.2	2.5	2.2	2.9
36. The Mortar Fire Control System (MFCS) integrates mortars into the fire support architecture and provides full field artillery tactical data system compatibility. It consists of a fire direction center and three subsystems (position navigation, fire control, and situational awareness) mounted on mobile platforms. MFCS is scheduled to complete fielding to the III Corps in 2004.	5.1	7.4	5.7	30.0

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
37. The Division Tactical Exploitation System (DTES) is a replacement for the Mobile Integrated Tactical Terminal (MITT). DTES is a division asset that is required to process, exploit, and disseminate information from a combination of national, theater, and tactical intelligence assets. DTES will feed data to the Army's All Source Analysis System at division levels. The Army only requires 10 DTESs and the 4th Infantry Division and 1st Cavalry Division are scheduled to receive their units in fiscal year 2003. The 3rd Armored Cavalry Regiment will receive a Tactical Exploitation System-Light (TES-Light), which is a replacement for the Forward Area Support Terminal (FAST); the TES-Light is scheduled for fielding to the 3rd Armored Cavalry Regiment in fiscal year 2004. DTES has operational testing scheduled to begin in fiscal year 2002, and the TES-Light is scheduled to begin operational testing in fiscal year 2003.	12.9	12.9	29.9	22.2
38. The Multiple Launch Rocket System (MLRS) provides a high volume of firepower in a very short time frame. MLRS consists of a self-loading launcher with an onboard fire control system. The launcher is mounted on a derivative of the Bradley Fighting Vehicle, that carries 12 rockets or 2 Army Tactical Missile System (ATACMS) missiles, which can be fired individually or simultaneously. Rockets have a range beyond 30 kilometers, and the ATACMS Block IA missile can reach beyond 300 kilometers. The MLRS M270 launcher is the standard U.S. Army platform for firing surface to surface artillery rockets and missiles. The Product Improvement Program includes two major upgrades to the current M270 launcher-Improved Fire Control System and Improved Launcher Mechanical System. It also includes Guided MLRS Rocket, High Mobility Artillery Rocket System, and MLRS Smart Tactical Rocket (MSTAR). MSTAR was terminated by PBD 745. The initial operational test and evaluation is scheduled for May-June 2001 and the full-rate production decision in September 2001.	59.5	228.4	49.4	28.2

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
39. The OH-58D Kiowa Warrior is a two-seat, single engine armed reconnaissance helicopter, which is a highly modified version of the OH-58A/C Kiowa. The primary mission of the Kiowa Warrior is armed reconnaissance in air cavalry troops and light attack companies. The aircraft operates autonomously providing armed reconnaissance, command and control, and target acquisition/designation for Apache helicopters and other airborne weapons platforms. The Safety Enhancement Program (SEP) was initiated in fiscal year 1996 to incorporate R3 engines, crashworthy crew seats, supplemental restraint system, digitization, and improved weapons interface. The Army plans to upgrade 385 aircraft under the SEP configuration. Aircraft fielded with the III Corps have limited digital capability. This will be upgraded in a two-phase effort to provide full aviation messaging capability for the first digitized corps by 2004.	0	46.9	0	45.1
40. The M109A6 Paladin is a 155-mm self-propelled howitzer. It has been approved for full-scale production and is designed to upgrade the M109A2/A3. The Paladin digitization initiative will integrate an FBCB2 capability into the platform. While there is no formal operational test of the FBCB2 enhancement, Paladin is scheduled to participate in the April 2001 DCX and the November 2001 FBCB2 initial operational test and evaluation.	2.5	2.7	2.6	5.2
41. The objective of the Personal Communications System (PCS) program is to develop commercially available wireless cellular telephone technology for secure mobile satellite services and terrestrial applications. The Warfighters Information Network—Terrestrial (WIN-T)operational requirements document requires PCS to provide selected users with a wireless hand-held device that interfaces with the WIN-T network and the Global Information Grid over terrestrial, airborne, and military and commercial satellite links in order to exchange multimedia information between users.	2.4	0	0	0
42. The Palletized Load System is capable of loading and unloading itself and a companion trailer in 5 minutes, which allows flexible mission assignment and operation under adverse conditions. The Palletized Load System-Enhanced-Driver Viewer Enhancer (PLS-E-DVE) is an infrared imaging device that operates in the micrometer wave bands and that is passive, lightweight, and vehicle powered. The thermal viewing system increases vehicle mobility under very poor driving conditions and provides situational awareness, target and ambush detection, and vehicle tracking. The DVE funding program on this platform for fiscal year 2005 was eliminated by PBD 745.	0	1.9	0	1.9

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
43. The Palletized Load System-Enhanced-Movement Tracking System (PLS-E-MTS) can identify position, track progress, and communicate with the operators of tactical wheeled vehicles. It has global positioning system capability, can send base-to-mobile and mobile-to-base messages, and can locate/track an asset's position using personal computer-based software. The system is scheduled to be fielded to most III Corps units in fiscal year 2001.	0	6.4	0	16.4
44. The RAH-66 Comanche is an advanced light attack/armed reconnaissance helicopter currently being developed. The Comanche features a five-bladed bearingless main rotor; a shrouded tail rotor; and a composite fuselage having low radar cross-section, retractable weapons pylons, and a fly-by-wire flight control system. The Comanche is intended to replace the current fleet of AH-1 and OH-58 helicopters in all air cavalry troops and light division attack helicopter battalions, and to supplement the AH-64 Apache in heavy division/corps attack helicopter battalions. The engineering and manufacturing development milestone decision was scheduled for April 2000. III Corps fielding is scheduled to begin with eight aircraft in July 2005 for initial operational test and evaluation.	562.7	0	725.7	0
45. Radio Frequency Tags/Automation Information Technology (RF Tags/AIT) provides asset visibility/in-transit capability to units and managers. The tags are an assemblage of commercial off-the-shelf equipment that store embedded data of container contents, shipments, and vehicle identification. The tags are fixed to containers to track material through the distribution system. Formal operational testing will not be conducted on RF Tags but will be part of the overall initial operational test and evaluation of the Global Combat Support System- Army (GCSS-A), which is scheduled to start in November 2000.	0	20.7	0	23.9
46. The Sentinel system consists of an X-band radar with its prime mover/power HMMWV that supports protection of maneuver forces and critical assets from cruise missile, unmanned aerial vehicles, and rotary wing and fixed wing aircraft threats. It prevents fratricide and is capable of operating day or night in all weather conditions. It provides alerting/cueing of short-range air defense weapons. The Sentinel fielding to the first digitized division and the first digitized corps is complete.	8.4	25.5	3.6	31.7

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Acquisition status and purpose of Category 2 systems	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
	Research and development	Procurement	Research and development	Procurement
47. The Standard Installation/Division Personnel System 3 (SIDPERS3) supports field commanders in peace, contingencies, and war with accurate military personnel information for decision-making and management of personnel assets. The SIDPERS3 replaces the current 1972 system with a modern database management system and provides increased functionality and personnel asset visibility. The system is scheduled to be fully fielded to the Army by October 2000; fielding to Fort Hood units is scheduled for June 2000.	9.2	6.9	6.2	4.9
48. The M707 Striker provides combat observation lasing teams (COLT) with enhanced surveillance, reconnaissance, target location, and target designation. Essentially, Striker is the functional equivalent of the BFIST system mounted on a HMMWV. An initial operational test and evaluation of Striker is to be combined with the M7 BFIST initial operational test and evaluation; however, the initial operational test and evaluation is unfunded. The initial operational test and evaluation may have to be delayed. Strikers are scheduled to be fielded to the 1st Cavalry Division and the 3rd Armored Cavalry Regiment by the end of 2004, but the 4th Infantry Division is not scheduled to receive its Strikers until 2005. The initial fielding of the Striker will be to the 3rd Infantry Division at Fort Stewart.	0	19.1	0	21.4
49. The Tactical Airspace Integration System (TAIS) will provide battle commanders in echelons above corps, corps, and divisions with automated Army Airspace Command and Control and improved air traffic services. TAIS uses Army Common Hardware and Software and also commercial off-the-shelf hardware and software. It is intended to employ a Defense Information Infrastructure-compliant modular software design to be interoperable with the Army Battle Command System. TAIS will be delivered to the 1st Cavalry Division by September 2000. Initial operational test and evaluation is scheduled for June 2001.	0	20.7	0	19.2
50. The Transportation Coordinator's Automated Information for Movement System II (TC AIMS II) is a joint service migration system that is intended to provide an integrated set of transportation applications to facilitate movements management of personnel, equipment, and supplies from home station to the conflict and back. Operational testing is scheduled for the fourth quarter of fiscal year 2000, and some additional operational testing will be required as incremental development packages (software) are developed.	8.1	10.4	9.9	25.4

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Acquisition status and purpose of Category 2 systems	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
	Research and development	Procurement	Research and development	Procurement
51. The Tactical Interactive Ground Equipment (TIGER) was a combat service support concept to collect platform logistics data (e.g., fuel, oil, ammunition). The concept did not mature beyond the planning phase because of concerns about the amount of bandwidth needed for continuous real-time updates.	0	0	0	0
52. Army Tactical Operations Centers (TOCs) are the automated command posts throughout the battle space where commanders and their staffs prepare, monitor, and alter the execution of battle plans. The Army Battle Command Systems that provide the command and control framework for the digitized battlefield are located within TOCs. A standard/common TOC operational architecture tailored to each individual echelon of command and mission area is being developed to assure interoperability and commonality. TOCs consist of Standard Integrated Command Post Systems either mounted on vehicles or fielded as free-standing tents. While TOCs do not have a formal initial operational test and evaluation, they will be evaluated in other digitization system tests, such as the FBCB2, Maneuver Control System, and during the Division Capstone Exercise. Fielding to the 4th Infantry Division —27 TOCs —is expected to be completed by the end of 2000. Fielding to the first digitized corps is scheduled to be completed by September 2004. A TOC used to support an aviation brigade is known as an Aviation TOC (AVTOC). (Note: funding amounts include AVTOC, see item 8, and Wireless LAN, see item 55.)	6.0	17.3	7.9	29.3
53. Trojan Spirit II provides tactical commanders critical intelligence connectivity via voice, data, video, and facsimile at all security levels. The system uses satellite communications to provide tactically deployed military intelligence units with a worldwide, quick reaction reporting and tasking capability. The fielding of the 38 Army Trojan Spirit IIs began in 1993, with a 10-year life cycle design. Army Training and Doctrine Command planned to have the Trojan Spirit II functions migrate to the Area Common User System, managed by the program manager for WIN-T. Although the WIN-T operational requirements document provides WIN-Intelligence Gateway equipment, it is unclear whether WIN will be able to provide the Trojan Spirit II capability before Trojan Spirit II equipment will become obsolete and unsupportable. There is currently a $6.375 million unfunded requirement for Trojan Spirit II recapitalization to replace the equipment that will become obsolete and unsupportable.	0	4.9	0	4.9

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	Funding estimate fiscal year 2001		Funding estimate fiscal year 2002	
Acquisition status and purpose of Category 2 systems	**Research and development**	**Procurement**	**Research and development**	**Procurement**
54. The Tactical Unmanned Aerial Vehicle (TUAV) is a brigade commander's system. As the commander's primary day/night, reconnaissance, surveillance, and target acquisition system, it allows the commander to "see and understand" the battle space and ultimately contributes to the commander's dominant situational awareness. A TUAV system consists of four basic components: the Ground Control Station and related equipment, Air Vehicle, Modular Mission Payloads, and communications. An initial operational test and evaluation is scheduled for the third quarter of fiscal year 2001.	29.4	37.8	11.9	44.7
55. Through the wireless Local Area Network (LAN) program, the Army is working to deliver two wireless TOCs to the first digitized division in June 2000 for a proof of principle experiment. The program manager for WIN-T will provide training and logistical support for 2 years. Army officials stated that a wireless LAN capability will not be ready for fielding to the first digitized division or first digitized corps. (Note: funding for wireless LAN is included in TOCS, see item 52.)	0	0	0	0
56. The Wolverine Heavy Assault Bridge was developed to provide an improved and modernized gap-crossing capability for heavy maneuver forces. The program has been canceled through PBD 745.	0	0	0	0
Total of funding estimates	**$1,573.9**	**$2,397.1**	**$1,911.7**	**$2,460.8**

Comments From the Department of Defense

ASSISTANT SECRETARY OF DEFENSE
6000 DEFENSE PENTAGON
WASHINGTON, DC 20301-6000

COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE

July 7, 2000

Mr. Allen Li
Associate Director, Defense Acquisition Issues
National Security and International Affairs Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Li:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "BATTLEFIELD AUTOMATION: Army Needs to Update Fielding Plan for First Digitized Corps," dated June 2, 2000 (GAO Code 707451/OSD Case 2029).

The Department generally concurs with the report and its recommendation. The Army's digitization effort includes the fielding of a mix of high-priority systems (designated by the Army as Category 1) and lower-priority systems (designated by the Army as Category 2 systems). DoD supports increased efforts in tracking the acquisition status of the Army's Category 2 systems as recommended by this report.

To this end, the Army has agreed to include the acquisition status of the Category 2 systems with their recurring Brigade Set Fielding reporting process. This reporting concept will obviate the need for an additional report to meet this new requirement.

The Department appreciates the opportunity to comment on the GAO draft report. Our specific response to the GAO recommendation is enclosed.

Sincerely,

Arthur L. Money

Enclosure

GAO DRAFT REPORT DATED JUNE 2, 2000
(GAO CODE 707451/OSD) CASE 2029

ARMY NEEDS TO UPDATE FIELDING PLAN FOR
FIRST DIGITIZED CORPS"

DEPARTMENT OF DEFENSE COMMENTS TO
THE GAO RECOMMENDATIONS

RECOMMENDATION: The GAO recommended that the Secretary of the Army direct the preparation of an annual acquisition status report which identifies (1) when each Category 2 system is expected to be fielded and (2) alternate fielding strategies focused on the successful establishment of the first digitized corps (FDC) by the end of 2004.

DOD RESPONSE: Concur, with comments. The Department agrees with the findings of this report and will initiate steps to provide this information to the Army leadership as part of the Brigade Set Fielding routine reporting process. However, certain areas require clarification.

Even though all systems will not be available for FDC, and some of those available may not be interoperable at that time, there are major benefits from those systems that will be available. These systems will provide operational benefits by themselves, as part of Army's modernization effort.

Army's current analyses suggest that benefits resulting from the expected digitization at FDC will indeed support the changed composition of the 4th Infantry Division (4ID). Although 4ID's manning and organizational structure has been reduced and the expected area of operations increased, the department is confident that significant additional gains will be realized from the benefits of digitization and modernization.

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