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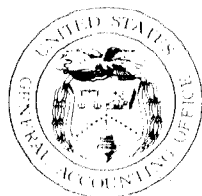
United States General Accounting Office

Briefing Report to the Chairmen,
Subcommittees on Defense, Senate and
House Committees on Appropriations

December 1989

ARMY BUDGET

Potential Reductions in Helicopter Programs



**National Security and
International Affairs Division**

B-223087

December 12, 1989

The Honorable Daniel Inouye
Chairman, Subcommittee on Defense
Committee on Appropriations
United States Senate

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

As you requested, we reviewed the justifications for selected aircraft procurement line items in the Army's \$3.2 billion fiscal year 1990 budget. Specifically, we examined the Army's request for about \$2.3 billion for six helicopter systems—the AH-64A Apache, the UH-60A Black Hawk, the OH-58D Army Helicopter Improvement Program, the Light Helicopter Program, the CH-47D Chinook, and the MH-47E and MH-60K Special Operations Aircraft modifications. Also, we reviewed the justifications for the Army's research, development, test, and evaluation budget request as it related to these six systems. In addition, we evaluated the Army's execution of the budgets for fiscal years 1988 and 1989 to identify potential reductions. We briefed your staffs in June 1989 on the tentative results of our work.

We identified \$359.2 million in potential reductions to the Army's aircraft procurement and research, development, test, and evaluation budgets: \$31.0 million for fiscal year 1988, \$187.5 million for fiscal year 1989, and \$140.7 million for fiscal year 1990. These budget reductions may be possible because (1) requirements were revised, and/or contract estimates were lowered after the budgets had been submitted; (2) acquisition schedules slipped; (3) funds are being considered for purposes for which they were not originally intended; (4) funds were not earmarked for specific purposes; (5) estimating errors were made; and (6) programs were terminated after the budgets were submitted. Appendix I fully describes the potential budget reductions.

As agreed with your offices, we did not obtain official agency comments on this report. However, we discussed its contents with officials of the Office of the Secretary of Defense and the Army and incorporated their comments where appropriate. In most instances, Army program officials agreed that certain funds were not needed for their budgeted purposes. However, in many cases, they believe that reductions should not be

made because the funds might be needed for other purposes. Our objectives, scope, and methodology are discussed in appendix II.

We are making this report available to various congressional committees; the Secretaries of Defense and the Army; and the Director, Office of Management and Budget. Copies will also be made available upon request.

If you or your staff have any questions, I may be reached on (202) 275-4141. GAO staff who made major contributions to this report are listed in appendix III.

A handwritten signature in cursive script that reads "Richard Davis".

Richard Davis
Director, Army Issues

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Abbreviations

AHIP	Army Helicopter Improvement Program
GAO	General Accounting Office
LHX	Light Helicopter Program
RDT&E	research, development, test, and evaluation
SOA	Special Operations Aircraft

Potential Reductions to the Army's Aircraft Procurement and Research, Development, Test, and Evaluation Budgets

The Army's aircraft procurement budget for fiscal year 1990 was \$3.2 billion: \$1.3 billion for aircraft procurement, \$1.1 billion for aircraft modifications, \$0.6 billion for spares, and \$0.2 billion for support equipment and facilities. The Army's aircraft research, development, test, and evaluation (RDT&E) budget for fiscal year 1990 was \$0.6 billion.

As table I.1 shows, we identified potential reductions of about \$359.2 million—\$31.0 million for fiscal year 1988, \$187.5 million for fiscal year 1989, and \$140.7 million for fiscal year 1990 for the six programs we reviewed. The rationales for these reductions are discussed by helicopter system below.

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Potential Reductions to the Army's Aircraft
Procurement and Research, Development,
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**Table I.1: Summary of Potential
Reductions to the Army's Aircraft
Budgets**

Dollars in millions				
Army aircraft program	Fiscal year			Total
	1988	1989	1990	
AH-64A Apache				
Procurement	0.0	\$55.8	\$15.4	\$71.2
Modifications	0.0	0.0	14.7	14.7
Support equipment and facilities	0.0	0.0	12.3	12.3
Total	0.0	55.8	42.4	98.2
UH-60A Black Hawk				
Procurement	\$7.3	15.0	32.5	54.8
RDT&E	15.0	39.4	26.2	80.6
Total	22.3	54.4	58.7	135.4
OH-58D Army Helicopter Improvement Program				
Modifications	7.8	52.5	0.0	60.3
Support equipment and facilities	0.0	2.5	0.0	2.5
Total	7.8	55.0	0.0	62.8
Light Helicopter Program				
RDT&E	0.0	7.9	19.9	27.8
Total	0.0	7.9	19.9	27.8
CH-47D Chinook				
Modifications	0.0	4.7	9.8	14.5
Total	0.0	4.7	9.8	14.5
Special Operations Aircraft				
Modifications	0.0	2.1	9.9	12.0
RDT&E	0.9	7.6	0.0	8.5
Total	0.9	9.7	9.9	20.5
Total potential reductions	\$31.0	\$187.5	\$140.7	\$359.2

AH-64A Apache

The AH-64A Apache is the newest Army attack helicopter. It is designed to provide improved capabilities, such as increased standoff, adverse weather and night capabilities, and improved survivability. This two-person, twin-engine helicopter carries up to 16 Hellfire missiles or 76 2.75-inch rockets and varying amounts of 30-millimeter ammunition. The Army began to acquire the Apache in fiscal year 1982, and it plans to continue procuring the helicopter through fiscal year 1991. A total of

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807 Apache helicopters will be procured, including 675 through fiscal year 1989.

The Airborne Adverse Weather Weapons System, which is a separate funding element within the Apache program, is planned to provide a fire-and-forget capability for the Apache and the Light Helicopter Program (LHX). The system, consisting of a fire control radar and a Hellfire missile, is designed to designate targets in adverse weather, either at night or during the day.

We identified total potential reductions of \$98.2 million to the Apache budget: \$55.8 million for fiscal year 1989 and \$42.4 million for fiscal year 1990.

**Procurement Budget for
Fiscal Year 1989**

The Army's procurement budget for fiscal year 1989 included \$932.1 million to buy 72 Apaches and \$6.3 million for Apache modifications. We believe that, because of changes in costs, requirements, and funding, this budget could be reduced by \$55.8 million: \$5.7 million for procuring fewer engines at less cost per engine than requested and \$50.1 million because the Army has decided not to go forward with a multi-year advanced procurement as originally planned.

**Engine Procurement Less Than
Budgeted**

The Army budgeted \$70.5 million to procure 148 engines in fiscal year 1989. However, it only purchased 146 engines for \$64.8 million. Accordingly, we believe that the difference of \$5.7 million should be considered for reduction. Apache program officials said that this amount will be needed to pay costs related to some engineering change proposals for the Apache engines.

**Multiyear Procurement Not
Planned**

The fiscal year 1989 Apache budget contained \$83.5 million in advanced procurement funding for a proposed multiyear procurement. However, multiyear procurement is no longer planned under the Army's revised Apache budget.

We analyzed the actual contract per-unit procurement costs for fiscal years 1987 through 1989, and on the basis of an average per-unit cost, we estimate that only \$33.4 million is needed for this purpose. We believe that the difference of \$50.1 million in advanced procurement funding should be considered for potential reduction.

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Apache program officials said that \$9.7 million of the proposed reduction will be needed to cover the costs of several engineering change proposals. They agreed that the remaining \$40.4 million exceeded needs for fiscal year 1989 single-year procurement, but they anticipate requesting approval to use the excess funds to cover what they believe will be a shortfall for fiscal year 1990 under the Army's revised budget. The officials did not have documentation to support the shortfall.

**Procurement Budget for
Fiscal Year 1990**

In its fiscal year 1990 budget, the Army requested \$826.1 million to buy 72 Apaches, \$38.1 million for Apache modifications, and \$12.3 million for Apache support equipment and facilities. The Army reduced the Apache buy to 66 aircraft at \$788.6 million in its revised fiscal year 1990 budget. We believe that, because of schedule changes, calculation errors, and cost changes, the Army's aircraft procurement budget for fiscal year 1990 could be reduced by \$42.4 million:

- \$15.4 million in procurement funds because of an incorrect calculation of the cost for extended range kits and cost changes in the revised budget;
- \$14.7 million in modification funds for procurement of the flight data recorders/fault analyzers and laser protective visors, which is behind schedule; and
- \$12.3 million in support equipment and facilities funds for the procurement of the combat weapon emergency procedures trainer, which is behind schedule.

**Procurement Funds Not Needed
Due to Calculation Error and
Cost Changes**

We believe that the Apache procurement budget for fiscal year 1990 can be reduced by \$15.4 million. Of that amount, \$1.6 million can be attributed to an incorrect calculation of the cost of extended range kits; \$10.7 million to an overestimation of cost increases anticipated as a result of revising the budget; and \$3.1 million to an underestimation of decreases in advanced procurement costs anticipated as a result of revising the budget.

The Army requested \$31.0 million in fiscal year 1990 aircraft procurement funds for alternate mission equipment and production support. This amount included \$2.6 million for 36 extended range kits at \$26,000 each. We calculated that 36 units at \$26,000 would cost \$0.94 million, or \$1.6 million less than the Army's estimate. Apache program officials agreed with our calculations and reduced the cost for the 36 extended range kits to \$0.94 million. However, it added the \$1.6 million to other individual cost elements within the estimate so that the total estimate

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remained at \$31.0 million. We believe that the \$1.6 million could be considered for potential reduction.

As part of its revision of the fiscal year 1990 aircraft procurement budget, the Army reduced the number of Apaches it planned to procure from 72 to 66 helicopters. The Army estimated that reduction would increase procurement costs by \$16.0 million—from \$736.1 million to \$752.1 million—and decrease advanced procurement costs by \$53.5 million—from \$90.0 million to \$36.5 million. The Army attributed the cost changes to a reduction in the number of aircraft being procured, the use of single versus multiyear contracts, and earlier-than-expected termination of the program. At the time of its original budget submission, the Army planned multiyear production contracts through fiscal year 1994; however, at the time of its revised budget, it planned to use annual production contracts through fiscal year 1991.

We analyzed the actual contract per-unit procurement costs for fiscal years 1987 through 1989, and on the basis of an average per-unit cost, we estimate that the above changes will increase procurement costs by about \$5.3 million, or \$10.7 million less than the Army's estimate, and that advanced procurement costs will only be \$33.4 million, or \$3.1 million less than the Army's estimate. We believe that the differences of \$10.7 million for procurement and \$3.1 million for advanced procurement should be considered for potential reduction.

Apache program officials did not question our analysis but stated that the Army's revised budget is too low. They believe that procurement costs will actually be \$819.2 million, or \$67.1 million higher than the Army's estimates for fiscal year 1990. However, they did not provide documentation to support their estimate.

**Modification Funds Not Needed
Due to Production Delays**

We believe that the fiscal year 1990 modification budget could be reduced by \$14.7 million. Of that amount, \$13.2 million can be attributed to production delays of the flight data recorder/fault analyzer and \$1.5 million to potential delivery delays of the laser protective visor.

The Army requested \$13.2 million in fiscal year 1990 modification funds to procure 127 flight data recorders/fault analyzers and 590 wiring kits for the Apache. The flight data recorder/fault analyzer is designed to acquire, process, and record data for use in mishap investigations. The wiring kits enable the flight data recorder/fault analyzer to be installed in the Apache.

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In May 1987, the Army contracted for 99 flight data recorders/fault analyzers for the Apache. Production deliveries were scheduled to begin in December 1988. However, because of developmental problems with the prototypes, the contracting officer does not expect these deliveries to begin until the first quarter of fiscal year 1991. This procurement will be funded with fiscal year 1988 funds.

Because the Army will not use the fiscal year 1990 funds for data recorders/fault analyzers in fiscal year 1990 and because we believe that the wiring kits should not be purchased until the final configuration of the data recorder/fault analyzer is determined, we believe that the \$13.2 million should be considered for reduction. Apache program officials agreed that the development of the data recorder/fault analyzer has been delayed but believe that the fiscal year 1990 procurement funds should remain available to the program.

The Army requested \$1.5 million in fiscal year 1990 modification funds to procure 680 laser protective visors. The visor protects Apache crew members' eyes from laser radiation and ballistic fragments. The visors are behind schedule due to problems with getting the subcontractors ready for production. In July 1989, the contractor delivered a prototype visor for testing. Apache program officials said that the visor draft test report will not be completed until the end of November 1989 and that the initial procurement award of 400 visors is now scheduled for June 1990.

The Army received \$1.6 million in fiscal year 1989 funding for the initial procurement. We believe that this funding should be used to procure the visor in fiscal year 1990 and that the \$1.5 million requested for fiscal year 1990 should be considered for potential reduction. An Apache program official agreed and said that, because of recent visor program slippage, the fiscal year 1989 funds will be used in fiscal year 1990 and the fiscal year 1990 funds will not be needed until later.

**Support Equipment and Facilities
Funds Not Needed Because
Procurement of Equipment Is
Behind Schedule**

The Army's fiscal year 1990 aircraft procurement budget includes \$12.3 million in the support equipment and facilities line item to procure four combat weapon emergency procedures trainers. The trainers will enable Apache helicopter units to train pilots and copilots/gunners in cockpit procedures, weapon switching, crew integration, and emergency procedures. The Army received \$12.2 million in fiscal year 1988 funding for an earlier procurement of four trainers. Apache program officials advised us that the first four trainers may not be procured until the second quarter of fiscal year 1990 or later, depending on the software

alternative selected. Also, they were uncertain of the cost of procuring the trainers. We believe that the fiscal year 1988 funding of \$12.2 million should be used for the procurement that is now scheduled to occur in fiscal year 1990. The \$12.3 million requested for fiscal year 1990 should be considered for potential reduction. Apache program officials agreed with our analysis but believed that the funds should remain available for other program requirements. They did not provide documentation identifying the "other program requirements."

UH-60A Black Hawk

The Black Hawk is a twin-engine, single-rotor, medium-lift helicopter with a primary mission to transport troops and equipment. Additional functions are to provide aeromedical evacuation, troop resupply, and command and control. The Black Hawk is the Army's first true squad assault helicopter. The current production version of the Black Hawk has been designated the "UH-60A."

However, the Army proposed a UH-60 Multi-Stage Improvement Program, designated the "UH-60M," to improve the Black Hawk's performance. The program would have been accomplished under three separately contracted efforts: the Competitive Production Engine Program, the Composite Rotor Program, and the UH-60M Airframe Modification. The UH-60M airframe modifications included modifications such as extending the aircraft cabin, incorporating a cargo hook, and improving the troop seats. The Defense Review Board did not approve the program, and the Army plans to halt development of the UH-60M.

Under a separate program, the Army modified the Black Hawk's General Electric turboshaft engine. Beginning in October 1989, this version of the Black Hawk, designated the "UH-60L," will enter production, replacing the UH-60A.

We believe that the Army's Black Hawk procurement budgets for the 3 fiscal years could be reduced by \$54.8 million and its Black Hawk RDT&E budgets for the 3 fiscal years by \$80.6 million. These reductions are attributable to the cancellation of the planned UH-60 Multi-Stage Improvement Program and an overprocurement of engines in fiscal years 1988 and 1989.

Cancellation of the Multi-Stage Improvement Program

The Army's aircraft procurement and RDT&E budgets for fiscal years 1988, 1989, and 1990 included funds for the UH-60 Multi-Stage Improvement Program. Because this program was not approved by the Defense Review Board and was subsequently cancelled, we believe that these funds should be considered for reduction. Therefore, we believe that the Army's aircraft procurement budgets could be reduced by \$29.1 million: \$7.3 million for fiscal year 1988, \$15.0 million for fiscal year 1989, and \$6.8 million for fiscal year 1990. Also, we believe that the RDT&E budgets could be reduced by \$80.6 million—\$15.0 million in fiscal year 1988, \$39.4 million in fiscal year 1989, and \$26.2 million in fiscal year 1990.

The fiscal year 1988 and 1989 Army procurement budgets included funds for Black Hawk airframe improvements, engine improvements, and "other requirements." At that time, the Army's plans for the Black Hawk program consisted of three components—airframe improvements, engine improvements, and the Multi-Stage Improvement Program. We believe that the \$7.3 million budgeted in fiscal year 1988 and the \$15.0 million budgeted in fiscal year 1989 for "other requirements" were intended for the Multi-Stage Improvement Program and could be considered for reduction.

Black Hawk program officials disagreed with our proposed reductions to the aircraft procurement budgets for fiscal years 1988 and 1989. They said that funds had not been specifically appropriated in those years for the Multi-Stage Improvement Program and that the Army had been using the funds we identified for other Army requirements. However, they agreed with our proposed reductions in all 3 fiscal years' RDT&E funds. However, they said that the RDT&E funds not used for the program had been returned to the Department of the Army. The Army's revised budget does not show a reduction in the program's RDT&E funds, and we believe that a reduction should be considered.

The Army's fiscal year 1990 budget included \$11.8 million for tooling. Our analysis of the tooling requirement shows that about 58 percent of the production line processes were related to changes associated with the UH60M model, which will not be produced. Therefore, we believe that a potential reduction of at least \$6.8 million, or 58 percent of the \$11.8 million, is possible.

Black Hawk program officials said that the percentage of the tooling budget applicable to the UH-60M was smaller than the percentage we

identified. Regardless of the actual percentage, they said that any tooling funds no longer needed to produce the UH60M will be required for the upgrade and replacement of tooling due to the increase in the total number of Black Hawks to be procured in future years. They were not able to provide documentation to support these statements.

Over-Procurement of Engines

The fiscal year 1990 budget could be reduced because of engine overprocurement in fiscal years 1988 and 1989. In fiscal year 1988, the Army overestimated the number of T-700 engines required for the Black Hawk before the switch to the more powerful T-701C engine, resulting in the purchase of nine T-700 engines above its requirements. The T-700 engine will no longer be installed in the aircraft after the fourth quarter of fiscal year 1989. According to Black Hawk program officials, the nine T-700 engines will be sold to the Air Force for about \$4.0 million, which is the same amount nine T-701C engines will cost the Army. We believe that the funds needed to procure nine T-701C engines in fiscal year 1990 should come from the funds available from the Air Force sale. Thus, the fiscal year 1990 budget could be reduced by about \$4 million. Black Hawk program officials concur.

Only 18 of the 72 aircraft procured in fiscal year 1989 will have the new T-701C engine. The 18 aircraft require 36 engines, yet the Army is planning to procure 84 engines (excluding 6 flight test engines), resulting in 48 more engines than are needed. We believe that the Army could reduce its planned fiscal year 1990 engine procurement by these unneeded 48 engines and the fiscal year 1990 budget by \$21.7 million, the cost of the 48 engines.

Black Hawk program officials said that the T-701C engine procurement only appears to be accelerated relative to production requirements because there is a 21-month lead time from when the T-701C engine is ordered and when it is actually received. However, the Army's fiscal year 1990 budget submission shows this lead time as 15 months. At the current delivery rate of approximately 7 engines per month, the Army will have sufficient numbers of engines to meet its planned fiscal year 1990 aircraft production requirements without the extra 48 T-701C engines.

OH-58D Army Helicopter Improvement Program

The OH-58D is a modified version of the OH-58A observation helicopter. Aircraft modernization for this helicopter is accomplished under a budget line identified as the Army Helicopter Improvement Program (AHIP). The upgraded OH-58D provides the Army with improved nap-of-the-earth flight capability, target acquisition, and target designation under day, night, and adverse weather conditions.

A salient feature of the OH-58D is the mast-mounted sight, which is a 25-inch sphere mounted above the main rotor, allowing the helicopter to perform target acquisition and designation functions while remaining hidden from enemy view. In addition, infrared sensors in the sight allow the OH-58D to acquire targets at night and during limited visibility conditions. Other modifications include a four-blade main rotor, an updated control display system, and a significantly improved power and drive train system. OH-58Ds will be used in a reconnaissance role to locate and maintain contact with the enemy, provide firsthand information and intelligence, support attack helicopter missions, and direct artillery fire. The OH-58D will also operate as an interim scout, pending the fielding of the Army's new Light Helicopter System.

Production of the OH-58Ds began in fiscal year 1984. In August 1986, the Secretary of the Army decided to terminate the program after fiscal year 1987. However, the Congress authorized additional funding for fiscal year 1988 for continued OH-58D modifications. In April 1989, the Secretary of Defense again terminated the OH-58D modernization program. No funds have been requested for fiscal year 1990 or fiscal year 1991. As of June 23, 1989, the Army had taken delivery of 132 OH-58Ds and expected deliveries to continue through June 1991, at which time the OH-58D fleet will consist of 207 aircraft.

Our analysis indicated that the Army's aircraft procurement budget for the OH-58D modifications could be reduced by \$62.8 million—\$60.3 million in aircraft procurement and \$2.5 million in fiscal year 1989 support equipment and facilities funds. The \$60.3 million results from potential reductions of \$7.8 million for fiscal year 1988 and \$52.5 million for fiscal year 1989 to the aircraft procurement account.

Procurement Budget for Fiscal Year 1988

The Army's aircraft procurement budget for fiscal year 1988 contained \$158.7 million for OH-58D modifications. We believe that the Army does not need \$7.8 million of this amount: \$3.4 million in advanced procurement funds for avionic equipment is no longer needed because the AHIP

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program has been terminated, and \$4.4 million is due to an overstatement of planned engineering change order obligations. The Army has not completed its estimate of the cost of terminating the program.

**Advanced Procurement of
Avionic Equipment No Longer
Needed**

According to budget documents, the AHIP project manager intended to obligate \$3.4 million of its fiscal year 1988 advanced procurement money for avionic equipment to be used during the fiscal year 1990 procurement. Since the AHIP was terminated after the fiscal year 1989 production buy, the \$3.4 million in advanced procurement funds is no longer needed and is therefore available for reduction. The project manager agreed that these funds were no longer needed for avionic equipment; however, he said that they should not be reduced because they were needed to cover other program costs.

**Engineering Change Obligations
Overstated**

The Army's budget submission for fiscal year 1990 showed that the AHIP program office planned to obligate \$11.7 million of fiscal year 1988 funds for the engineering change order and engineering change proposal budget lines. Revised budget documents show that the program office currently intends to obligate \$7.3 million of the fiscal year 1988 funds for these items. As a result, the fiscal year 1988 budget could be reduced by \$4.4 million, the difference between the two amounts. The AHIP project manager agreed that the engineering change order/proposal budget was overstated but believed that the excess funds were needed to cover other program costs.

**Procurement Budget for
Fiscal Year 1989**

The Army's aircraft procurement budget for fiscal year 1989 contained \$202.6 million for OH-58D modifications and \$5.2 million for AHIP ground support equipment and facilities. We believe that the Army could reduce the modification budget by \$52.5 million—\$29.0 million in advanced procurement funds is no longer needed due to the termination of the program; \$21.1 million is attributed to an overestimation in the cost of engineering change orders; and \$2.4 million is attributed to an overestimation of systems program management costs. Also, we believe that the ground support equipment and facilities budget could be reduced by \$2.5 million because of an overestimation of the cost of ground support equipment.

**Advanced Procurement Funds
No Longer Needed**

The AHIP budget for fiscal year 1989 included \$34.0 million in advanced procurement funds to be used for fiscal year 1990 production. Because the AHIP was terminated after the fiscal year 1989 production buy, the fiscal year 1989 advanced procurement funds planned for use in fiscal year 1990 are no longer needed and are available for reduction. The

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Army has obligated \$5.0 million of these funds, leaving \$29.0 million available for reduction. An AHIP program official stated that these funds should not be reduced. He said that they are needed to cover other program costs.

Engineering Change Costs Are Overstated

The AHIP program office budgeted \$35.9 million for the cost of engineering change orders and engineering change proposals in fiscal year 1989. We believe that \$21.1 million of these funds is not needed and should be considered for reduction. This reduction consists of \$11.1 million over and above revised engineering change plans and \$10.0 million for the funding of new engineering changes that will require future additional funding to complete. The program office has no definite plans to fund these changes in the future.

Revised budget documents show that the program office currently intends to obligate only \$24.8 million of the \$35.9 million—\$19.8 million in fiscal year 1989 and \$5.0 million in fiscal year 1990. The remaining \$11.1 million is not needed and should be considered for reduction.

In addition, we believe that \$10.0 million is available for reduction from the remaining \$24.8 million. The AHIP budget included \$10.0 million in fiscal year 1989 for the cost of engineering changes in the design and development phase for various modifications to provide air-to-air and air-to-ground weaponry, improve communication devices, and upgrade aircraft survivability equipment. Current AHIP program office estimates indicate that as much as \$400 million will be necessary in the next 5 fiscal years to equip all 207 aircraft with these improvements. However, the AHIP program has been terminated, and no funds have been requested for fiscal years 1990 or 1991 to make these modifications. Therefore, we believe that the \$10.0 million could be reduced from the fiscal year 1989 budget.

AHIP program officials disagreed with our proposed budget reduction. Despite cancellation of the program, the program manager believes that the Army will provide funds for fiscal year 1990 and beyond to complete these modifications to the OH-58D fleet.

Program Management Costs Overestimated

We believe that the AHIP program office's budget of \$23.2 million for system program management in fiscal year 1989 could be reduced. Actual and proposed system program management costs total \$20.8 million, leaving a difference of \$2.4 million, which may not be needed and could be reduced from the budget. The AHIP project manager agreed that

the program management budget was overstated, but he said that these funds are needed for other program requirements.

**Ground Support Equipment
Obligations Less Than Expected**

According to the Army's budget submission for fiscal year 1990, the AHIP program office planned to obligate \$5.2 million of fiscal year 1989 funds for the procurement of ground support equipment. However, under its most current plan it intends to obligate only \$2.7 million for this purpose. As a result, the remaining \$2.5 million is available for reduction. While a program official agreed that the ground support equipment budget was overstated, he believes that the funds are needed for continuing program requirements.

**Light Helicopter
Program**

The Army's Light Helicopter is intended to be capable of performing multiple missions against the advanced enemy air defenses of the 1990s. The Army wants the LHX to perform both scout and attack helicopter functions, including battlefield reconnaissance, finding and attacking armored targets, striking deep against enemy positions, and engaging enemy helicopters in air combat. Current plans call for the procurement of 2,096 LHXs at program costs expected to exceed \$40 billion.

From fiscal year 1983 through fiscal year 1988, the Congress appropriated a total of \$463 million in RDT&E funds for the LHX program, which the Army applied to engine development and preliminary design of the airframe and the mission equipment. In fiscal year 1989, the Congress appropriated \$124 million in RDT&E funds to support the LHX demonstration and validation effort. In addition, the Army had available \$55 million in prior years' funds to continue engine development.

For fiscal year 1990, the LHX program office is requesting \$51.7 million in RDT&E funds for continued engine development and \$240.7 million in RDT&E funds for airframe and mission equipment development. We believe that \$7.9 million could be reduced from the fiscal year 1989 engine development budget. In addition, we believe that \$19.9 million could be reduced from the fiscal year 1990 LHX budget—\$7.0 million from the airframe budget and \$12.9 million from the engine development budget.

**RDT&E Budget for Fiscal
Year 1989**

Because of differences in budgeted and actual costs, the Army could reduce its fiscal year 1989 budget estimate for the T-800 engine—the engine being developed for the LHX—by \$7.9 million. The Army's fiscal year 1989 budget request for the LHX engine was \$55.4 million, including

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\$50.9 million for the T-800 engine contract. This request is for \$10.4 million more than the cost of the actual full-scale development contract for the T-800 engine, which was awarded in 1988. In addition, the LHX program office used \$1.5 million of fiscal year 1988 funds to meet the fiscal year 1989 engine contract. These two items produce a total excess amount of \$11.9 million in fiscal year 1989 engine funds. However, the LHX program office subsequently reprogrammed \$4.0 million of the \$11.9 million to the LHX airframe and mission equipment program lines. As a result, only \$7.9 million is available for reduction.

LHX program officials do not believe that the \$7.9 million should be reduced from the fiscal year 1989 budget because it could be used to fund other requirements. For example, one official said that the program could use \$2.1 million for airframe integration and engine mock-up and the remaining \$5.8 million to purchase six developmental engines—three would be provided to the U.S. Coast Guard and three would be installed in test aircraft.

**RDT&E Budget for Fiscal
Year 1990**

The Army's fiscal year 1990 RDT&E budget could be reduced by \$19.9 million—\$7.0 million for the LHX airframe and \$12.9 million for the T-800 engine. In its RDT&E budget for fiscal year 1990, the Army requested \$240.7 million for LHX airframe and mission equipment. We believe that \$7.0 million of this amount is available for reduction. An LHX program official said that \$7.0 million had been included in the budget request for anticipated reductions made by the Congress or higher headquarters; however, he did not agree that the money should be removed from the budget. The program officials said that without extra funds the program would be unable to meet its requirements.

The Army's RDT&E budget request for fiscal year 1990 contains \$51.7 million for T-800 engine development, including \$46.7 million for the fiscal year 1990 portion of the T-800 engine contract. This request is \$12.9 million more than the actual fiscal year 1990 contract amount of \$33.8 million. LHX program officials agree that the budget request is overstated; however, they do not believe that the funds should be reduced because these funds could be used for other LHX requirements. The officials said that these program requirements include \$6.0 million to help fund an engine replacement program of the U.S. Coast Guard and to fund the advanced procurement of LHX development engines; \$2.0 million to complete the purchase of six developmental engines; and \$2.6 million to the National Aeronautics and Space Administration to

begin development of a test stand for various aircraft transmission, rotor, and engine tests.

CH-47D Chinook

CH-47 helicopters are used for the air transport of troops, ammunition, weapons, equipment, and other cargo as well as for medical evacuation and aircraft recovery. The CH-47D Chinook is the modernized version of the Army's tandem-rotor, twin-engine, medium-lift helicopter, which provides improved handling and increased performance over earlier CH-47 models. The modernized version provides substantial improvements in reliability, survivability, maintainability, and flight safety. Improvements in CH-47D performance result, in part, from the use of new composite rotor blades, an upgraded transmission, and new turboshaft engines. In addition, the CH-47D incorporates a new auxiliary power unit; a triple hook cargo system; and upgraded hydraulics, electrical systems, and flight controls.

On January 13, 1989, the Army awarded a 3-year contract, covering fiscal years 1990 through 1992, to Boeing Helicopters for modernization of the last 144 CH-47 aircraft into the "D" model configuration. At the completion of this contract, the Army will have a total fleet of 472 CH-47Ds, at a total cost of \$3.3 billion.

We believe that the Army's aircraft procurement budget for the CH-47D could be reduced by \$14.5 million—\$4.7 million for fiscal year 1989 and \$9.8 million for fiscal year 1990.

Procurement Budget for Fiscal Year 1989

The Army's aircraft procurement budget for fiscal year 1989 included \$246.3 million for CH-47 modifications. We believe that this amount could be reduced by \$4.7 million because it did not include all the fiscal year 1988 advanced procurement funding.

In planning its fiscal year 1989 budget, the Army had available \$68.3 million in fiscal year 1988 advanced procurement funds for CH-47 modifications. However, in its fiscal year 1989 budget, the Army listed only \$63.6 million as fiscal year 1988 funds available for the modifications—\$4.7 million less than was actually available. By understating the advanced procurement funds available from fiscal year 1988, the Army overstated the fiscal year 1989 budget funds needed for the CH-47 modifications planned in fiscal year 1989. Program officials agreed but said that the \$4.7 million is needed for other purposes, such as funding the cost of proposed engineering changes.

**Procurement Budget for
Fiscal Year 1990**

The Army's aircraft procurement budget for fiscal year 1990 included \$304.5 million for CH-47 modifications. We believe that this amount could be reduced by \$9.8 million—\$8.3 million due to lower-than-expected engine costs and \$1.5 million due to lower-than-expected contract costs.

Lower Engine Costs

The portion of the fiscal year 1990 budget for the advanced procurement of engines is overstated by \$8.3 million because engine unit costs are lower than expected. The Army's budget was based on a unit cost of about \$747,000 per engine; however, the actual cost per engine is about \$609,000. Costs were overestimated because the Army included an 18-percent factor to compensate for possible engine production line stoppage and failed to deflate to constant dollars when calculating the inflation rate. Program officials no longer believe that the production break will occur. As a result, \$8.3 million could be reduced from the budget. Program officials said that this reduction should not be made because the funds could be used to cover anticipated increases in the costs of repairing or replacing components of a CH-47 before modifications begin.

Lower Contract Costs

The Army signed a new multiyear contract for CH-47 modifications at an amount less than was budgeted. We believe that, as a result, \$1.5 million can be reduced from the fiscal year 1990 budget element for total current year costs. Program officials agreed that the budget is overstated but said that the budget should not be reduced because the funds will be needed for other purposes such as compensating for cost increases because of engineering changes.

**Special Operations
Aircraft**

The Army plans to modify 51 CH-47D Chinook helicopters to the MH-47E configuration and 23 UH-60A Black Hawk helicopters to the MH-60K configuration. These Special Operations Aircraft (SOA) are to perform clandestine, deep penetration airlift missions in adverse weather with limited lighting and visibility during day and night conditions over all types of terrain in support of special operations forces. The Army considers currently configured aircraft to be lacking in their ability to perform special operations missions due to limited performance characteristics, vulnerability to various weapons systems, and limited self-deployment capability.

To satisfy current operational requirements, the Army established the SOA program to enhance the operational capability of existing aircraft. Among the most significant changes are (1) improved engines;

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(2) improved navigation and communications capabilities by the addition of an integrated avionics system; (3) increased armaments, including air-to-air missiles and upgraded suppressive weapons; (4) improved aircraft survivability equipment; and (5) increased range through added internal and external fuel tanks and air-to-air refueling capabilities.

We believe that the Army's RDT&E and aircraft procurement budgets for SOA can be reduced by \$20.5 million: \$0.9 million from the fiscal year 1988 RDT&E budget, \$7.6 million from the fiscal year 1989 RDT&E budget, \$2.1 million from the fiscal year 1989 aircraft procurement budget, and \$9.9 million from the fiscal year 1990 aircraft procurement budget.

**RDT&E Budget for Fiscal
Year 1988**

The Army has not obligated \$7.3 million of the fiscal year 1988 RDT&E funds it budgeted for MH-47E engine development. Currently, the program office plans to obligate only \$6.4 million of these funds for engine development. As a result, we believe that the remaining \$0.9 million is available for reduction. An SOA program official said that these funds should not be reduced because the office could use them for other SOA requirements that have not been fully funded.

**RDT&E Budget for Fiscal
Year 1989**

We believe that the Army's RDT&E budget for fiscal year 1989 could be reduced by \$7.6 million—\$6.3 million in undocumented requirements and \$1.3 million in unnecessary government-furnished equipment.

Undocumented Requirements

The Army's RDT&E budget for fiscal year 1989 included \$53.3 million for the SOA program. SOA program officials could provide documents supporting requirements for only \$47.0 million of these funds, leaving a difference of \$6.3 million. We believe that the budget could be reduced by this unsupported amount. Program officials agreed with this assessment but believe that these funds should remain available for other program requirements.

**Unnecessary Government-
Furnished Equipment**

The Army's RDT&E budget for fiscal year 1989 contained \$2.5 million to purchase government-furnished equipment for the SOA program. Although RDT&E funds are 2-year funds, the Army Materiel Command requires that the program office obligate them within 1 year. Funds not obligated within 1 year are reprogrammed to other programs. In this case, the SOA program had until the end of September 1989 to obligate the funds. However, at the time of our review, the SOA program office had not obligated any of the funds and had only defined program requirements for \$1.2 million of them. As a result, the remaining

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\$1.3 million could be considered for reduction. Program officials said that the budget should not be reduced because they could use these funds for other requirements.

**Procurement Budget for
Fiscal Year 1989**

The Army's aircraft procurement budget for fiscal year 1989 included \$17.1 million in advanced procurement funds to modify SOA by adding a forward-looking, infrared sensor. The Army budgeted about \$805,000 for each of 20 units; however, the actual cost per unit is about \$699,000. As a result, the budget is overstated by \$2.1 million and could be reduced by that amount. SOA program officials said that the budget should not be reduced so that the overage would be available for funding other requirements.

**Procurement Budget for
Fiscal Year 1990**

We believe that the Army's SOA aircraft procurement budget for fiscal year 1990 could be reduced by \$9.9 million—\$4.4 million because of a reduction in the cost of modifying MH-47E engines and \$5.5 million because production setup for the MH-60K may not be needed due to delays.

**Reduction in Engine Modification
Costs**

The Army budgeted \$36.0 million, including \$21.5 million in fiscal year 1990, for the modification of 127 MH-47E engines through fiscal year 1990. Current supporting budget documentation shows that only \$31.6 million is required to modify the 127 engines—a difference of \$4.4 million. We believe that the fiscal year 1990 budget could be reduced by \$4.4 million. SOA program officials believe that these funds should not be reduced because the funds are needed for program realignments.

**Unnecessary Production Setup
Costs**

In fiscal years 1989 and 1990, the Army budgeted \$22.5 million for MH-60K production setup—\$11.5 million in fiscal year 1989 and \$11.0 million in fiscal year 1990. However, delays have occurred in contracting for the production setup, and as of June 30, 1989, the fiscal year 1989 funds were unobligated. Also, at that time the program office had plans for obligating all of the fiscal year 1989 funds and \$5.5 million of the fiscal year 1990 funds. Therefore, we believe that the fiscal year 1990 budget could be reduced by the remaining \$5.5 million. Program officials believe that these funds should remain available in fiscal year 1990.

Objectives, Scope, and Methodology

The Chairman of the Subcommittee on Defense, Senate Committee on Appropriations, and the Chairman of the Subcommittee on Defense, House Committee on Appropriations, asked us to review the basis of, and justification for, the Army's fiscal year 1990 budget estimates. This report is one of a series of reports responding to this request. This review assesses the adequacy of the fiscal year 1990 budget estimates for Army aircraft procurement, which include estimates for aircraft modification and spares. To perform this assessment, we selected budget requests for six Army helicopter systems, representing \$2.3 billion of the Army's \$3.1 billion aircraft procurement budget request for fiscal year 1990, to review in detail and to determine whether the aircraft programs should be funded in the amounts requested. The aircraft systems we reviewed were the AH-64A Apache, the UH-60A Black Hawk, the CH-47D Chinook, the OH-58D Army Helicopter Improvement Program, the Light Helicopter Program, and the MH-47E and MH-60K Special Operations Aircraft modifications.

Since procurement, modification, and spares funding remain available for obligation for 3 fiscal years, we also reviewed the budget execution for fiscal years 1988 and 1989 for the selected systems to identify potential reductions. In addition, we reviewed the Army's research, development, test, and evaluation budget request as it related to the six aircraft systems.

We performed our review primarily at the Army's Aviation Systems Command, St. Louis, Missouri. This organization is responsible for developing Army aircraft budgets and implementing prior-year funding programs. In examining the execution of and justification for the selected aircraft system budgets, we evaluated budget documents to determine the degree to which they had been adequately supported by cost estimates, program requirements, and valid methodology. Also, we reviewed the Army's budgets for fiscal years 1988 and 1989 to determine the amounts appropriated, spent, and potentially available as excess funds. We did not validate the Army's alternative uses for the funds we believed were available for potential reduction.

In addition, we assessed planned systems improvements or modifications and the relationship of these changes to budget requests and execution. We examined program status documents, such as schedules, cost proposals, test results, and other program documents. We interviewed Army officials responsible for the management, development, and acquisition of the systems we reviewed.

Appendix II
Objectives, Scope, and Methodology

We performed our work from January to July 1989 in accordance with generally accepted government auditing standards.

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