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

MISSION ANALYSIS AND
SYSTEMS ACQUISITION DIVISION

B-206613

APRIL 13, 1983

The Honorable Caspar W. Weinberger
The Secretary of Defense

Attention: Office of GAO Report Analysis



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Dear Mr. Secretary:

Subject: The B-1 Bomber Program--A New Start
(GAO/MASAD-83-21)

We recently completed our review of the B-1B bomber program. This review was made because the B-1B is a key element of the strategic force modernization program, is costly, and has a compressed development and production schedule to meet the initial operational capability date of 1986. Our review was also directed at examining the B-1B cost estimates, management plans, and cost performance reports.

The Air Force and the Department of Defense activities involved in the B-1B acquisition were visited to discuss the program with Air Force and other Defense personnel. The contents of a draft of this report were discussed with the Office of the Secretary of Defense (OSD) and Air Force officials and their comments have been incorporated as appropriate. Our review was made in accordance with generally accepted government auditing standards.

We found that the B-1B program cost estimate still omits known program costs. These omissions were reported by us to the Subcommittee on Defense, House Committee on Appropriations, by testimony on July 22, 1982. We are concerned that the cost omissions obscure congressional visibility of the B-1B acquisition. In this regard, we recommend that you have your Office provide the Congress in a single package an estimate, including all the acquisition costs related to the B-1B program.

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We would also like to share with you observations on some other areas for your future consideration as the program matures. These areas include multiyear procurement, logistics, and testing.

A brief discussion on cost estimate omissions and the other areas follow.

B-1B COST ESTIMATE STILL
EXCLUDES CERTAIN COSTS

The B-1B \$20.5 billion cost estimate prepared by the B-1B Program Office to acquire 100 aircraft excluded program acquisition costs of about \$1.4 billion identified by independent OSD and Air Force cost analysts. Our testimony in July 1982 before the House Appropriations Committee, Subcommittee on Defense, discussing the B-1B program cost estimate reported these cost omissions.

In our view, OSD and Air Force guidance defining program acquisition costs permit varying interpretations of what is to be included in major acquisition cost estimates. For example, one instruction requires all costs to be included in the program estimate unless funded by a separate program element. The important factor in this instruction is how the item is funded. Another requires that the cost estimate include all directed effort for which the program office has management responsibility, regardless of the source of funds. A third instruction dealing with Selected Acquisition Reports is so vague in describing program acquisition costs that one could use many interpretations.

We believe the different interpretations of the acquisition cost guidance was highlighted by OSD and Air Force independent cost estimates prepared on the B-1B program. The independent analysts concluded that many costs excluded from the program cost estimate historically have been included in weapon system acquisition cost estimates and should be included in the B-1B estimate. The following chart shows the costs identified.

<u>Cost category</u>	<u>Air Force independent cost group</u>	<u>OSD independent cost group</u>
	(in billions of fiscal year 1981 dollars)	
Simulators	\$.340	\$.300
Continuing engineering development/component improvement	.187	.150
Development of organic depot capability	.237	.400
Miscellaneous (i.e., first destination transportation; others)	.020	.100
Interim contractor support	.034	.263
Facilities	.068	.070
Retrofit costs	.567	-
Manufacturing technology	-	.150
Total	<u>\$1.453</u>	<u>\$1.433</u>

We feel that excluding certain program costs from the estimate is an important issue concerning the B-1B program. We believe that the Congress would have better visibility of the acquisition cost if all related costs were reported in one place. Excluding cost items from the B-1B program element could also cloud the funding process and unintentionally affect the time phasing of funds later on in the aircraft program. In this regard, the Air Force Systems Command noted that the design of the Defense planning, programming, and budgeting system intended that all components of a weapon system be accumulated under a single program element for management visibility.

AIR FORCE PLANS MULTIYEAR
PROCUREMENT IN THE B-1B PROGRAM

The Air Force is planning to keep program acquisition costs down through multiyear procurement initiatives. However, the Air Force has not yet demonstrated that the B-1B program meets the procurement criteria for that type of contracting. The criteria, set out in Public Law 97-86 and an OSD policy memorandum,

require that the (1) multiyear procurement benefit the government through reduced contract costs and enhanced national security, (2) agency have confidence in the estimated cost savings, (3) equipment be stable in design, (4) program have stable funding, and (5) requirement continues to be valid.

The B-1B acquisition estimate of \$20.5 billion includes an \$800 million (fiscal year 1981 dollars) savings for multiyear procurement. An Air Force analysis in November 1982 based on preliminary inputs from contractors indicated savings of less than \$800 million if the program is initiated on the existing schedule beginning in fiscal year 1984. Air Force officials informed us that firm contractor proposals were received by the Air Force in December 1982 and evaluations of them are in progress.

To come closer to achieving the \$800 million savings, the Air Force may seek congressional approval for multiyear procurement authority through a supplemental request for fiscal year 1983. If approval is granted, the Air Force would authorize contractors to purchase economic order quantities of items and materials considered stable, and available at a cost savings. According to Air Force officials, the early multiyear procurement authority proposal would not require additional funds in fiscal year 1983, but would be a reprogramming action.

Previously, on September 13, 1982, we reported to the Chairman, Subcommittee on Defense, House Committee on Appropriations, that the projected multiyear cost savings of \$800 million for the B-1B program were based on a methodology we considered very unreliable and that discounting had not been used to consider the time value of money.

The multiyear criteria require a program to have a stable design before this method of procurement is acceptable. An OSD policy memorandum on multiyear procurement dated May 1, 1981, stated,

"The item should be technically mature, have completed research, development, testing and evaluation (RDT&E)--including development testing or equivalent--with relatively few changes in item design anticipated and underlying technology should be stable."

The research, development, test and evaluation phase for the B-1B, full-scale development effort is scheduled to continue into fiscal year 1987. For fiscal year 1984 through 1987, 51 percent of the research, development, test and evaluation funds are to be requested for the B-1B program. Further, the development flight testing for the program is to continue through June 1986. Avionics flight testing will not start until July 1984.

Air Force officials informed us that the B-1B will offer a stable configuration and be technically mature at the time multiyear procurement contracts are awarded. They believe stability is achievable early in the program because of the prior B-1A airframe and engine development and testing program and because B-1B offensive avionics are partly common with the B-52 and the F-16.

After our discussion with Defense officials on a draft of this report in early January 1983, the Chairman, Subcommittee on Defense, House Committee on Appropriations, by letter dated January 28, 1983, requested us to assess Defense's proposed multiyear candidates, including the B-1B, in the Defense fiscal year 1983 supplemental budget. We are in the process of obtaining from the Air Force the detailed support as to how the Air Force believes the B-1B program meets the legislative criteria for multiyear contracting.

LOGISTICS SUPPORT CONCERNS

B-1B maintenance concept centers around built-in test equipment

The B-1B maintenance concept depends on the built-in test equipment, Central Integrated Test System (CITS), to determine what subsystems are faulty while the aircraft is in operation. It is to be connected with a ground data processing system which accumulates data to analyze aircraft maintenance trends to help reduce maintenance and predict failure of components critical to flight safety and the aircraft mission.

According to an Air Force Test and Evaluation Center report dealing with other aircraft that have a built-in test system, isolating equipment problems has historically been difficult to accomplish with any reasonable level of success. The B-1A CITS

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for the most part was unsuccessful and failed to adequately perform to specifications. In this regard, failure of CITS to perform as desired in the B-1B could result in increased costs for spares; additional test equipment; and a need for additional, more highly trained maintenance personnel. Or it could result in acceptance of reduced aircraft readiness.

The Strategic Air Command considers the development of CITS in the B-1B program as an item of concern. They have indicated a desire to reinforce the CITS capability with additional on-aircraft or flight-line test equipment to provide backup should CITS not work as planned.

B-1A program did not
emphasize logistics support

Logistics support considerations normally begin with the initiation of a weapon system concept. The purpose is to fully integrate logistics planning with engineering planning for the system and produce timely, cost-effective support. By the time full-scale development of the system is initiated, logistics planning should be mature. The B-1A program was oriented toward aircraft research and development efforts before it was terminated in 1977. Logistics support planning and development was being deferred until a production commitment was established. Although such a commitment was made in December 1976, the program was terminated in June 1977. Research and development and flight testing efforts continued on the B-1A aircraft after the acquisition program was terminated in 1977, but logistics support activities were minimal.

The B-1B logistics planning has been adversely influenced by an Air Force decision in the earlier B-1A program to defer development of logistics support. Because logistics support data and plans were limited in the earlier program, the B-1B logistics planning and development is behind other program efforts. The program manager is well aware of these problems and logistics planning and development is being given considerable attention.

B-1B program cost constraints
could affect developing
logistics support

The B-1B acquisition cost estimate of \$20.5 billion did not include costs to develop peculiar organic depot support.

Moreover, to stay within cost constraints, the Deputy Secretary of Defense directed the Air Force to develop such support without an increase in the acquisition cost estimate. Thus, the organic depot support development (estimated to be about \$400 million by the B-1B cost estimating team that prepared the acquisition estimate) must be absorbed in the \$1.8 billion estimated for all support activities peculiar to the B-1B.

The Deputy Secretary of Defense also directed the B-1B Program Office to control the B-1B design so as not to exceed the programmed 6 percent engineering change order budget. Typical aircraft programs use from 9 to 11 percent of flyaway costs for engineering change order budgets. Because of this constraint, the B-1B Program Office logistics officials do not foresee any logistics enhancement unless they also reflect significant acquisition cost savings.

Air Force officials, however, believe that past B-1A development efforts should reduce the need for engineering changes in the new program. They consider the maturity of the airframe and engine as sufficient in lowering engineering change requirements.

TEST PROGRAM--PAST AND FUTURE

A significant amount of testing was done under the prior B-1A program. There have been, however, configuration changes and redesigned avionics for the B-1B aircraft. Therefore, it is uncertain at this time how much of the earlier testing results can be applied to the new program. The Air Force currently is evaluating the prior test data to determine what is or is not applicable to the new program.

Time available for flight testing before the initial operational capability date in 1986 is limited. This is especially true for evaluating the effectiveness of the new defensive avionics. Avionics testing is scheduled to begin in July 1984 in a B-1A prototype aircraft. The first production B-1B aircraft flight testing is scheduled to begin in March 1985.

Between December 1974 and April 1981, four B-1A test aircraft flew about 1,900 hours completing about 90 percent of the scheduled airframe testing and about 67 percent of the flying quality test items. Flight tests conducted between February 1979 and April 1981 in the B-1A program showed that defensive

avionics countermeasures system never had time to mature to a level needed for operational testing.

Test schedule

Aircraft flight testing for the B-1B program is directed toward delivering a weapon system to the Strategic Air Command with a proven degree of performance by the initial operational capability date. The flight test program is limited by contract to activities which the contractor can accomplish by June 30, 1986. The flight test schedule follows:

<u>Aircraft</u>	<u>Test duration</u>	<u>Months per aircraft</u>	<u>Total planned hours</u>	<u>Primary test purpose</u>
B-1A #2	Apr. 15, 1983, to Nov. 15, 1984	19	275	Airframe testing
B-1A #4	July 15, 1984, to June 15, 1986	23	420	Avionics testing
B-1B #1	Mar. 15, 1985, to June 15, 1986	15	<u>305</u>	First production aircraft testing
			<u>1,000</u>	

The Air Force is responsible for additional test hours to demonstrate open design requirements the contractor is unable to accomplish within the 57-month flight test program imposed by the contract. If the Air Force does not buy additional flight test time to demonstrate the aircraft's design acceptability, the contractor will not have to meet the contract design requirements. The contractor informed the Air Force that limitations beyond its control, such as range support, weather, associate contractor support, and so forth, could inhibit the achievement of some flight test goals. Operational test objectives not satisfied during the combined development and operational flight program are to be addressed in follow-on testing budgeted outside the B-1B baseline.

AGENCY COMMENTS AND OUR EVALUATIONS

We received oral comments on a draft of this report from Defense officials. They informed us that the Air Force guidance

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for major weapon systems acquisition cost estimating is under review to determine if revisions are needed. The officials informed us that if revisions are made to the B-1B program cost estimate they prefer to include them as additions to the \$20.5 billion estimate.

We would have preferred that Defense include all applicable costs in the initial B-1B estimate when it was established. However, for various reasons they were not. What we believe is important now is to identify all the B-1B acquisition costs and provide them to the Congress in one package.

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As you know, 31 U.S.C. 720 requires the head of a federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Secretary of the Air Force and the Director, Office of Management and Budget. We are also sending copies to the Chairmen of the Senate and House Committees on Appropriations and Armed Services, the House Committee on Government Operations, and the Senate Committee on Governmental Affairs.

Sincerely yours,



W. H. Sheley, Jr.
Director