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Report to the Chairman, Committee on Armed Services, House of Representatives

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STRATEGIC BOMBERS

Estimated Costs to Deploy the B-1B

GAO/NSIAD-88-12

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International Affairs Division

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The Honorable Les Aspin
Chairman, Committee on Armed Services
House of Representatives

Dear Mr. Chairman:

Following our February 25, 1987, testimony on the B-1B before your Committee, you asked us to establish what it will eventually cost to deploy the baseline B-1B weapon system.

The Air Force has still not identified all tasks needed to complete development, procurement, and deployment of the baseline B-1B system, nor has it estimated the costs of all the tasks it has identified. The following table provides a reasonably good picture of eventual program costs to deploy the B-1B fleet including costs identified for potential enhancements to the baseline program.

Table 1: Summary of B-1B Costs

Dollars in billions

Cost Category	Then-year dollars
Baseline program funds appropriated or requested	$27 29
Non-baseline funds appropriated or requested	3 69
Future Costs	
Additional requirements in current Five Year Defense Plan	1 76
Additional requirements not yet approved by Air Force	1 35
Additional requirements for which costs have not yet been estimated	Unknown
Potential future cost growth due to development risk and incomplete testing	Unknown
Cost of completing potential enhancements	
Enhancements requested to date	1 58
Additional defensive electronics improvements	1 00
Other enhancements	Unknown

A discussion of each of these follows.

Baseline Cost Cap Is Likely to Be Exceeded

Currently, it appears that the B-1B cost cap will be exceeded. In 1981, certain portions of the B-1B development and production effort were defined as the baseline program, and a cap of $20.5 billion in fiscal year

1981 dollars was placed on the baseline. The Air Force currently estimates that $321.1 million of the $20.5 billion remains to complete this effort. However, the cost of remaining work is estimated at $411.9 million. Unless the Air Force estimates change, the cost cap will be exceeded by $90.8 million in fiscal year 1981 dollars. (Details are contained in appendiix III).

The baseline program did not include costs for B-1B flight simulators, logistical support, and other requirements. These costs, which are identified in appendix V, will total $3.69 billion through fiscal year 1989.

Air Force program officials said that it is too soon to state whether additional funds will be required to complete the baseline program. They said they will be in a position to talk about the baseline amount after their annual estimate is completed in December 1987.

Additional Requirements and Funding

In addition to the $27.29 billion baseline and $3.69 billion non-baseline funds already appropriated or requested in the current budget, the Air Force will need to request more funds for the B-1B program. The amount required will increase as the Air Force defines the cost of the work needed to complete deployment. Also, uncertainties in the defensive avionics development effort and the amount of testing to be completed provide potential for additional future funding requirements.

Some Future Requirements and Estimated Costs

The Air Force commands responsible for developing and deploying the B-1B system have identified requirements needed to complete aircraft deployment. These requirements, which total $3.11 billion, consist of

- $1.76 billion that has been approved by Air Force Headquarters and is included in the Five Year Defense Plan, but is not scheduled to be requested from the Congress until after 1989, and
- an estimated $1.35 billion in additional funds that the B-1B Program Office and the Air Force Logistics Command (AFLC) believe will be needed but have not yet been submitted to or approved by Air Force Headquarters.

Appendix I provides an explanation and breakout of these funds. It should be noted that both the $1.76 billion and the $1.35 billion are estimates and, as such, are subject to change during the Air Force's budget review. Without an official Air Force position, however, these estimates

provide the best information available on the tasks to be completed and the funds required.

The Cost of Other Additional Requirements Has Not Yet Been Estimated

An important milestone in the acquisition of any Air Force system is the transfer of program management responsibility from the system program office, which develops the aircraft, to the AFLC, which manages the program for the remainder of the time the aircraft is in service. This process, known as Program Management Responsibility Transfer (PMRT), includes the transfer of engineering responsibility, configuration management responsibility, and contracting functions. The transfer of responsibilities on the B-1B is scheduled for January 1989.

In May 1987, the B-1B Program Office and the AFLC established a joint task force to identify remaining B-1B support requirements, funding needs, and related issues as part of the planning for PMRT.

The task force has identified a number of tasks that need to be accomplished but has not yet estimated the costs to complete these tasks. Appendix II lists the tasks identified to date and provides a brief description of each. While this list may change as the definition of PMRT functions continues, any added tasks would require additional funds.

Unfinished Development and Testing Pose Cost Risks

A number of areas of potentially significant, but as yet undefined, cost risk remain in the B-1B program. The potential for cost growth largely depends on the success of planned efforts to solve known performance problems and the ability to complete the development test program as scheduled. As detailed in our testimony before your Committee[1], performance problems that must be corrected are still restricting the use of the B-1B. For example, until appropriate flight testing is completed, the B-1B is limited to

- 80 percent of its designed weight load,
- 80 percent of its designed flight envelope, and
- no lower than 500 feet over flat and rolling terrain on terrain-following flights.

The only exception to these restrictions—other than in carrying out development tests—would be in response to an emergency war order.

[1]GAO/T-NSIAD-87-4A, The B-1B Aircraft Program.

Development and testing of the defensive avionics needed to permit the B-1B to penetrate hostile airspace are currently far from completed. Although an incremental plan exists for completing this effort, much work remains to be done before final procurement and retrofit of an acceptable system are completed. Until the ongoing evaluation of the current phase of development is complete, an acceptable system test plan cannot be finalized. The defensive avionics contractor has proposed a test schedule lasting through February 1990. Completion of negotiations and finalization of the official test schedule is planned for November 1987.

The final measure of determining progress in resolving performance problems and reducing cost risk is the progress of the flight test program. Large portions of the flight tests remain to be completed, and progress in these tests will indicate the likelihood of completing the development effort within the current estimated cost. Appendix IV provides information about specific B-1B testing yet to be completed.

Because of these factors, we believe it is too early to determine whether additional time and funds will be required to complete the basic program. If additional problems develop, the alternative to more development and testing would be the release of the B-1B to the Strategic Air Command (SAC) with restrictions that would require problem resolution by SAC.

Potential B-1B Enhancements

The Air Force is planning certain programs to enhance B-1B baseline performance or capability. Such enhancements are not part of the baseline B-1B program and are not needed to field the basic system.

As we indicated in our February 1987 testimony, initial funding was requested for three capability enhancements—a forward-looking infrared sensor, a weapons interface to enable the B-1B to carry the new Short Range Attack Missile (SRAM) II, and an upgrade to the ALQ-161A defensive avionics system. These three enhancements are estimated to cost $1.58 billion.

Additionally, enhancements will have to be added to the B-1B if it is to be an effective penetrator through the 1990s. For example, the program office has worked on a modification to the ALQ-161A to enhance the B-1B's countermeasures against threat radars. The program office estimated the cost of this modification to be $999 million.

Other enhancements will be required to incorporate planned programs, such as the MILSTAR communications system, Global Positioning Systems (GPS) navigation system, nuclear safety devices, and classified weapons currently under development. None of these enhancements has been formally added to the program or included in program costs.

Conclusions

Additional funds, beyond those that have been requested, will be required to deploy the baseline B-1B weapon system. However, until these estimates are fully developed and approved by the Secretary of the Air Force and the Secretary of Defense, there will be no definitive estimate of the costs to complete the baseline B-1B program.

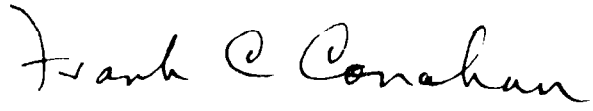
To estimate the eventual cost to complete development and deployment of the B-1B aircraft, we obtained cost estimates and held discussions with officials at the B-1B Program Office, Aeronautical Systems Division, Air Force Systems Command, and AFLC. We examined Air Force estimates of the costs to complete the development, production, and deployment of the B-1B fleet. Dates of Air Force cost estimates vary from February to September 1987, however, we used the latest cost estimates available at the completion of our review. Excluded from this report are costs not related to deployment or enhancement of the B-1B system, such as operations and maintenance. We updated our information on the test program by visiting and obtaining data from the B-1B Program Office and the B-1B Combined Test Force at Edwards Air Force Base, California. Our review was conducted in accordance with generally accepted government auditing standards.

We discussed this report with officials at the Office of the Secretary of Defense, the Aeronautical Systems Division, AFLC and Air Force Headquarters, and have included their comments as appropriate.

As arranged with your office, unless you publicly announce its contents earlier, we will not distribute this report until 30 days after its issue date. At that time, copies will be made available to appropriate congressional committees; the Secretaries of Defense and the Air Force; the

Director, Office of Management and Budget; and other interested parties.

Sincerely yours,



Frank C. Conahan
Assistant Comptroller General

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Abbreviations

AFLC	Air Force Logistics Command
GAO	General Accounting Office
PMRT	Program Management Responsibility Transfer
SAC	Strategic Air Command

Air Force Estimate of Funds Needed to Field the B-1B Fleet Beyond Those Appropriated and Requested in the Fiscal Year 1988-1989 Budget[a]

(millions of then-year dollars)

Item	In Five Year Defense Plan but not yet requested from Congress	Known but not presented to Air Force Headquarters	Total
Deployment Costs			
Common support equipment - standardized maintenance equipment procured and stocked by AFLC for one or more systems currently in the Air Force inventory	$19.3	$0	$19 3
Interim contractor support - required for maintenance until Air Force has organic maintenance capability	0	221.5	221 5
Post-production support planning - the establishment by AFLC of an engineering capability to correct design and other deficiencies in an Air Force system	0	154 0	154.0
Sustaining engineering - the establishment by AFLC of an organic engineering design, fabrication, and software capability for correction of deficiencies and modification of a deployed weapons system.	74 1	322 2	396.3
Depot purchased equipment maintenance - the maintenance and support of the equipment used to provide an organic Air Force depot repair capability	73.8	47.5	121 3
Replenishment spares - the continued procurement of spares by AFLC to complete the establishment of full stock levels of spares for aircraft support After reaching the approved stock levels, additional spares are procured over the aircraft life cycle to maintain the approved levels of parts	1,006 6	0	1,006 6
Development Costs			
Non-Baseline:			
Continuing engine development - propulsion program office effort during the engine life cycle to improve or correct faults of the engine.	$45.6	$0	$45.6
Retrofit of fleet to incorporate necessary design changes identified in testing.	536.9	0	536 9
Baseline:			
Air Force share of Airborne Instruments Laboratory's correction of deficiencies	0	169.1	169 1
Air Force share of Rockwell's over-target cost	0	210 1	210 1
The establishment by the B-1B program office of an organic depot support capability for the AN/ALQ-161A	0	228 5	228 5
Total	**$1,756.3**	**$1,352.9**	**$3,109.2**

[a]Some of the costs shown are continuous throughout the life cycle of the aircraft However, only costs through the fiscal year 1989 Five Year Defense Plan are included in this table because they are directly related to correction of deficiencies or establishment of an organic logistics support and maintenance capability during this period

Known but Not Yet Estimated B-1B Costs

Effort	Purpose
Contract close out	Funds will be necessary to cover normal shutdown activities, including tooling disposition, audit requirements, and final contractor negotiations. Program Office estimate for tooling disposition only is $142 3 million, however, the Air Force plans to avoid these costs by transferring some tooling to AFLC and giving the contractors the remainder The current book value of the tooling is over $900 million
Low priority engineering changes	The B-1B Program Office has a priority listing of change orders of over 140 engineering change proposals whose estimated costs exceed the funds currently available. The lower priority proposals, especially those improving reliability and maintainability, cannot be funded with available budget authority.
Cruise missile support	Funds will be necessary to pay for the storage of cruise missile support equipment at non-SAC bases in consonance with the provisions of the Strategic Arms Limitation Treaty and required by the B-1B Program Management Directive Additional B-1B cruise missile support equipment still remains to be procured.
Requisition of engineering data	Funds will be necessary to pay for the delivery of engineering drawings and data for use in reprocurement actions and for modifications
Electromagnetic pulse hardness maintenance and surveillance	Funds will be necessary to test B-1B nuclear hardened assemblies

B-1B Cost Cap Will Likely Be Exceeded, but Final Baseline Cost Remains Uncertain

Current cost estimates indicate that the $20.5 billion cost cap imposed on the original B-1B baseline program will likely be exceeded to complete full development and production of the basic B-1B aircraft. Based on current Selected Acquisition Report data and current cost estimates, funds needed to complete identified tasks will exceed the baseline by about $91 million. However, because current estimates of needed funding may change and additional requirements may be identified, it is too soon to state definitively how much additional money will be required.

Background

President Reagan, in a January 18, 1982, letter to the Congress, certified that the Air Force would complete the tasks necessary to develop and acquire a baseline B-1B system for an amount equivalent to $20.5 billion (in fiscal year 1981 dollars). This baseline did not include certain program costs ($3.7 billion appropriated or requested to date) for requirements such as flight simulators and interim contractor support, or logistics supports costs. (See appendix V.) Table III.1 shows the administration's original request in base-year (fiscal year 1981) dollars.

Table III.1: B-1B Baseline Funding Plan

(in fiscal year 1981 base-year dollars)

Appropriation	Amount (in millions)
Research, Development, Test, and Evaluation	$2,538.9
Procurement	17,961.1
Total	**$20,500.0**

Since 1982, there have been several cuts in the B-1B program baseline. These cuts were made mostly in fiscal year 1986 but affected both the fiscal year 1985 and 1986 appropriations for Research, Development, Test, and Evaluation and Procurement. The baseline cuts were due to (1) direct congressional decreases in funding, (2) Gramm-Rudman cuts, and (3) Department of Defense (DOD) apportionments of congressionally directed decreases in overall DOD funding. These cuts amounted to 1.27 billion in then-year dollars, which is equivalent to 933.5 million in base-year dollars.

Currently Estimated Costs Would Exceed the Cap

The current B-1B Selected Acquisition Report indicates that, including money requested in the current budget, only $321 million (in fiscal year 1981 dollars) remains available for appropriation within the cost cap. The B-1B Program Office is responsible for tracking program cost and its relationship to the fiscal year 1981 baseline estimate. Completing the

baseline tasks for which an estimate has been prepared is expected to cost an additional $412 million in fiscal year 1981 dollars. As shown in table III.2, the current estimates for these tasks alone exceeds the cost cap by $91 million.

Table III.2: Current Status of B-1B Baseline Funds and Estimated Additional Requirements

Dollars in millions

	Base year (fiscal year 1981) amount	Then-year amount
Baseline Funds		
Funds appropriated to date	$19,753 0	$26,697 9
Funds requested for fiscal year 1988/89	425.9	595 5
Total	**$20,178.9**	**$27,293.4**
Original baseline	$20,500 0	•
Funding remaining in baseline	$321 1	•
Additional Requirements[a]		
Correction of defensive avionics[b]	$119 5	$169 1
Rockwell s over-target cost[b]	148 5	210 1
Depot support for defensive avionics[b]	143 9	228 5
Total estimated to date	**$411.9**	**$607.7**
Funds over baseline	$90 8	•

[a]The base year dollars were calculated by deflating current estimates with the inflation rates in the latest B 1B Selected Acquisition Report

[b]Funds necessary to complete these tasks have not yet been requested

Final Baseline Cost Remains Uncertain

The final B-1B baseline cost remains uncertain because current estimates of funding needed to complete the remaining tasks may change. Hence, it is too soon to state definitively how much additional money will be required to complete the baseline program.

A more current B-1B estimate will be available when the Program Office completes its annual program estimate in the fall of 1987. Definition of remaining baseline tasks is also scheduled to be completed by that time. Finally, the fiscal year 1989-1990 budget submission should reflect on Air Force plans to fund completion of the B-1B development, procurement, and deployment effort.

Regardless of what the revised cost estimates are, they remain estimates. It will be several years before the actual cost of the baseline B-1B system can be determined. With development flight testing scheduled to

last into 1989, additional development problems may be discovered. Similarly, defensive avionics development, testing, and retrofitting will extend into the 1990s, with the risk of additional cost growth.

Status of B-1B Testing as of July 1, 1987

Testing to be completed	Percent of testing completed	Planned release to SAC	Planned B-1B fleet retrofit	
			Start	Complete
B-1B				
Stability and control	92	Nov 87		
Structures	74	July 89		
Flight controls	24	Nov 87	Oct. 87	Feb. 88
Air vehicle systems	94	Sept 87		
Terrain following	64	Feb 87	Feb 87	Mar 90
Offensive avionics	38	Apr 88	June 88	Aug 88
Defensive avionics	Unknown	Unknown	Unknown	Unknown
Capability of offensive/defensive avionics	19			
Weapons delivery	81	Dec. 87 (2-Bay) June 88 (3-Bay)		
Icing	13	Apr 89	Sept 88	Sept 89
Central Integrated Test Set (CITS) Compatibility	80	Oct 87	Oct 87	Dec 87
Cruise Missile[a]				
Flutter	0	Dec 88		
Airloads	6	Feb 89		
Stability and control	6	Feb 89		
Flight controls	0	May 88	Mar 88	Mar 90
Vibration and acoustics	19	Feb 89		
Propulsion/inlet airflow	0	Feb 89		
Air Launched Cruise Missile/ Advanced Cruise Missile Integration	5	Feb 89		
Avionics	0	Feb 89		
Ground handling	No tests identified	Feb 89		
CITS Integration	80	Dec. 87	Dec 87	Jan. 88
Ground support	0	June 88	June 88	Jan 89
Performance	18			

[a]Due to Strategic Arms Limitations Treaty considerations SAC is restricted in its use of cruise missiles on B-1B aircraft. The cruise missile testing relates only to its use on the B-1B.

Non-Baseline B-1B Funds Appropriated or Requested Through Fiscal Year 1989

Cost Category	Cost
Non-baseline Costs	
Simulators	$298.6
Continuing Engine Development	152.7
Interim Contractor Support	436.6
Facilities	365.8
Retrofit	228.4
Manufacturing Technology	12.0
Logistic Support Costs	
Common Support Equipment	205.1
Replenishment Spares	1,956 5
Sustaining Engineering	27 3
Depot Purchased Equipment Maintenance	12.4
Total	**$3,695.4**

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