

**DOCUMENT RESUME**

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Status of the B-1 Aircraft Program (Unclassified Digest).  
PSAD-77-35. February 16, 1977.

Report to the Congress; by Elmer B. Staats, Comptroller General.

Issue Area: Federal Procurement of Goods and Services: Notifying the Congress of Status of Important Procurement Programs (1905); Science and Technology: Management and Oversight of Programs (2004).

Contact: Procurement and Systems Acquisition Div.

Budget Function: National Defense: Weapon Systems (057).

Organization Concerned: Department of the Air Force.

Congressional Relevance: House Committee on Armed Services; Senate Committee on Armed Services; Congress.

The primary mission of the B-1 aircraft is to deter nuclear aggression by standing ready to deliver weapons from low altitudes at high subsonic speeds. Flight testing of the aircraft began in December, 1976. Findings/Conclusions: Flight testing of the B-1 aircraft has proceeded reasonably well and has disclosed no major problems which would dictate a delay in production. Testing has disclosed a number of areas requiring improvement. Major concerns over the program involve continuing increases in program costs and the pace of development of avionics subsystems. The following matters were noted during GAO's review: (1) problems involving aircraft components, the engine, and offensive avionics were not completely resolved and potential solutions must be tested further; (2) a complete demonstration of range was not accomplished during flight testing, but the Air Force stated that the B-1 will meet range requirements; (3) evaluation of the weapons system has not been completed; and (4) some risk is involved in the airframe design limit, but this risk is considered within an acceptable level. Program costs increased by \$1,693.5 million to \$22,889.5 million. Recommendations: The Secretary of Defense should analyze the results of complete static tests to assess the risk of proceeding with production without testing an airframe to 150% of the design limit load. The Secretary should provide Congress with information on recent independent cost estimates and the results of recent operational tests and evaluations.

(RRS)

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This is an unclassified digest furnished in lieu of a report containing classified security information.

FEB 16 1977

COMPTROLLER GENERAL'S  
REPORT TO THE CONGRESS

STATUS OF THE B-1 AIRCRAFT  
PROGRAM  
Department of the Air Force

D I G E S T

The primary mission of the B-1 aircraft is to deter nuclear aggression by standing ready to deliver weapons from low altitudes at high subsonic speeds. Full-scale development of the B-1 began in June 1970 and flight testing of development aircraft began in December 1974.

From September through November 1976, the B-1 program was reviewed by the Air Force, outside panels, and the Defense Systems Acquisition Review Council. On December 2, 1976, the Secretary of Defense authorized the Air Force to proceed with production of the B-1 aircraft but required a review by the Defense Systems Acquisition Review Council before proceeding with production of the defensive avionics subsystem which is still in the development phase.

The product on contracts were negotiated to limit the expenditure of procurement funds to a cumulative rate not to exceed \$87 million a month through June 1977. The first production aircraft is scheduled to be delivered in 1979 with initial operational capability scheduled for May 1982.

GAO reviewed the status of the B-1 aircraft program with emphasis on flight and ground test performance and problems. The flight testing of the development aircraft has proceeded reasonably well and has disclosed no major problems which would dictate a delay in production. As with any major developmental program, testing has disclosed a number of areas that will require improvement. (See pp. 13 to 27.)

The major concerns over this program at the current time are (1) the continuing increases in program costs and (2) the pace of development of avionics subsystems. (See pp. 6, 17, 18, and 28 to 31.)

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The following are the important matters noted during GAO's review:

- Many of the B-1 mission capabilities were demonstrated during the 417 hours of flight testing completed as of November 30, 1976. Some problems, involving aircraft components, the engine, and the offensive avionics, were not completely resolved and potential solutions must be flight tested further. Planned flight testing will continue into 1982. (See pp. 14 to 21.)
- During flight tests, the B-1 was flown on terrain following runs at mach 0.85 at 200 feet. Because of test range limitations, each run was limited to a few minutes. While a complete demonstration of range has not been accomplished during flight testing, the Air Force stated that analyzes based on the flight test indicate the B-1 will meet the range requirements. (See p. 10.)
- The Air Force Test and Evaluation Center completed an initial operational test and evaluation of the B-1 weapon system in October 1976. Center officials said the B-1 will have the capability to perform the missions for which it was designed. As of January 11, 1977, the final Center report was not yet published and, thus, not available for review by GAO. (See p. 19.)
- Static testing of major airframe components to 150 percent design limit load and an airframe to 100 percent of design limit load were completed. Aeronautical Systems Division engineering personnel have expressed concern over the adequacy of the B-1 static testing program. The Air Force recognizes that there is some risk involved in the latter; however, the Air Force considers this risk to be well within an acceptable level. (See pp. 22 and 23.)

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- Fatigue testing of major airframe components is scheduled to be completed in 1977. Fatigue testing of an entire airframe is scheduled to be done in 1981 and 1982. (See p. 23.)
- The engine product verification test program was completed in August 1976. Engine thrust requirements were met or exceeded, but weight and some of the fuel consumption requirements were not met. The tests to date have not demonstrated the capability of the engines to ingest a required number of small birds without significant power loss. Problem solving, further development, and testing of the engine will be part of a continued engineering development program scheduled to last until 1979. (See pp. 24 to 27.)
- Testing of the defensive avionics will begin in 1977. Analysis indicated that this subsystem's weight, electrical power, and cooling requirements will not be met but it is expected that when the subsystem is consolidated with other avionics items, the total weight, electrical power, and cooling specifications will be adequate. (See pp. 28 and 29.)
- Program cost increased by \$1,693.5 million to \$22,889.5 million. An independent cost estimate was made in 1974 using different methodology and estimates of inflation than used for developing the current estimate. A comparison of the estimates shows that current estimated program costs could be exceeded by several billion dollars. Air Force officials stated that the differences in the estimates were well within the range of estimating accuracy. An independent cost estimate completed in 1976 was not made available during GAO's review because the Department of Defense considered it to be an internal document being used at the time for decisionmaking purposes. (See pp. 5 to 8.)

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- Development of the expendable counter-measures subsystem, which dispenses flares and chaff, began in 1976. Flight testing of this subsystem is planned for 1979. (See p. 30.)
- The Air Force had not selected a tail warning set to detect the firing of air-to-air missiles so that expendable counter-measures can be more effectively used. (See p. 30.)
- Since production of defensive avionics is not scheduled to begin until 1979 and the first delivery is not scheduled until 1981, the first 34 production aircraft will be delivered without defensive avionics and will require retrofit when the equipment becomes available. (See pp. 30 and 31.)
- In approving the B-1 for production, the Secretary of Defense directed the Air Force to include in its follow-on testing: (1) nuclear hardening sufficient to meet the threat, (2) evaluation of detection range, and (3) alert response time and mission range. A test and evaluation master plan must also be submitted for review and coordination. (See p. 20.)

### RECOMMENDATIONS

GAO recommends that the Secretary of Defense analyze the results of completed static tests to assess the risk of proceeding with B-1 production without static testing an airframe to 150 percent of the design limit load.

In view of the continually increasing cost estimate for the B-1 program, the Congress should require the Secretary of Defense to provide them with information on (1) recent independent cost estimates and the consideration given to these higher estimates in developing the most recent B-1 program cost estimate and (2) the results of the initial

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operational test and evaluation and the consideration given to the results in approving the B-1 for production.

A draft of this report was reviewed by agency officials associated with management of the program and their comments have been incorporated as appropriate.