

INFLATION SAVINGS IN U.S. AIR FORCE AIRCRAFT PROGRAMS  
GENERATED BY ECONOMIC PRICE ADJUSTMENT CLAUSES

Staff Working Paper  
August 1985

The Congress of the United States  
Congressional Budget Office

# Report Documentation Page

*Form Approved*  
*OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE <b>AUG 1985</b>	2. REPORT TYPE	3. DATES COVERED <b>00-00-1985 to 00-00-1985</b>			
4. TITLE AND SUBTITLE <b>Inflation Savings in U.S. Air Force Aircraft Programs Generated by Economic Price Adjustment Clauses</b>		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S)		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Congressional Budget Office, Ford House Office Building, 4th Floor, Second and D Streets, SW, Washington, DC, 20515-6925</b>		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>	<b>Same as Report (SAR)</b>	<b>27</b>	

## PREFACE

---

This paper has been prepared by the Congressional Budget Office at the request of Congressman Joseph Addabbo, Chairman of the Subcommittee on Defense of the House Appropriations Committee. It analyzes savings in U.S. Air Force aircraft procurement contracts resulting from economic price adjustment clauses which link contract costs to the rate of inflation.

This paper was prepared by R. William Thomas of the National Security Division and Barbara Hollinshead of the Budget Analysis Division, under the general supervision of Robert F. Hale and John D. Mayer, Jr. Robert Kornfeld and Christian Frederiksen assisted with the analysis. Frank Pierce edited the paper.

August 1985

## INFLATION SAVINGS IN U.S. AIR FORCE AIRCRAFT PROGRAMS GENERATED BY ECONOMIC PRICE ADJUSTMENT CLAUSES

### BACKGROUND AND SUMMARY

---

Marked declines in the rate of inflation since 1980 have resulted in lower than anticipated costs for some Department of Defense (DoD) weapons systems acquisition programs. In 1980, the overall rate of inflation, as measured by the implicit price deflator for the Gross National Product (GNP), was 9.3 percent. In 1984, the GNP inflation rate was 3.7 percent and CBO projects that it will remain in the range of 3 to 4 percent through 1987. <sup>1/</sup> DoD prices have mirrored these trends in the economy. The rate of increase in prices for DoD purchases (excluding compensation and fuels) was 4.7 percent in 1984 as against 11.5 percent in 1980.

The rapid ebbing of inflation was not fully anticipated by the Administration or the Congress. Consequently, in the 1982-1985 period, DoD budgets included inflation projections that exceeded the actual rates by one to two percentage points. The extent to which DoD received funding in excess of its needs because of these overestimates is currently an issue of debate in the Congress.

For some weapons systems, at least, inflation savings are directly measurable. The U.S. Air Force is currently procuring a number of aircraft

---

1. See Congressional Budget Office, The Economic and Budget Outlook: Fiscal Years 1986-1990 (February 1985), p. 40.

under contracts that incorporate an economic price adjustment (EPA) clause. This clause provides for upward or downward adjustments in the total contract cost based on the rates of inflation in labor and materials used in the production program.

Inclusion of an EPA clause transfers the risk associated with predicting inflation from the contractor to the government. During the 1970s, inflation at higher than expected rates led to large increases in certain Air Force contracts that used the EPA mechanism. More recently, the fact that inflation has been at lower rates than projected has led to substantial savings in contracts that include EPAs.

Inflation is measured using national data compiled by the Bureau of Labor Statistics, which may not be the same as the prices paid by the contractors. Normally, EPAs adjust for "abnormal" escalation; that is, for deviations from the rates of inflation projected at the time the contract was negotiated. No adjustment is typically made for the first two years of the contract or if the deviations are small (less than 1-2 percent). EPAs are used only with firm fixed-price or fixed-price-incentive contracts. 2/

- 
2. In a fixed-price-incentive contract, the contractor's profit depends on his success in meeting a target cost. Increases in cost above this target are shared between the government and the contractor, up to a ceiling on the government's liability. Economic price adjustments change both the target cost and ceiling cost upward or downward, but do not affect the profit-sharing formula.

EPA clauses are not often used, since it is Air Force policy that the use of an EPA must be of demonstrated potential benefit to the government. In practice, this often means that the Air Force will propose using an EPA clause if the contractor will agree to reduce his price. Actual benefits or costs of the EPA will, of course, depend on the rate of inflation. Only 42 contract actions in 1984 (out of more than 16,000) included an EPA clause. These represented 6 percent of the value of all contracts let by the Air Force that year.

It now appears that the use of EPAs in the current generation of contracts will prove of substantial benefit to the government. CBO projects that for the five aircraft and three engine contracts included in this study, a total of over \$1.1 billion will be saved through EPA cost reductions over the lives of the contracts. Of this amount, \$735.5 million results from the C-5B contract alone. Table 1 shows CBO's savings projections. The first column gives actual savings through calendar year 1984, which amount to \$116.0 million. These results, being based on actual changes in labor and materials prices, may be considered firm. <sup>3/</sup>

Most of the \$1.1 billion total represents CBO estimates of EPA savings during 1985-1989, which are shown in column two of Table 1. These

---

3. One widely used index, the hourly earnings of production workers in the aircraft industry, was unavailable in 1984. In order to estimate savings, CBO projected its values for 1984.

estimates are based on CBO projections for the wage and price indexes used in each contract to adjust the allowed cost. In the case of the C-5B, for example, the first of the 50 aircraft is not expected to be delivered until

TABLE 1. SUMMARY OF ECONOMIC PRICE ADJUSTMENTS  
(Millions of dollars)

	CBO Estimates of EPA Savings			Funds Previously Released	Remaining Anticipated Savings
	Through 1984 <u>a/</u>	1985- 1989 <u>b/</u>	Total		
C-5B	55.3	680.1	735.5 <u>c/</u>	439.6	295.9
F-16A/B/C/D	37.0	71.5	108.5	32.4	76.1
KC-10A	13.9	170.3	184.2	112.5	71.7
T-46A	2.2	9.4	11.6	0	11.6
E-3A	0.7	0.1	0.8	(15.9) <u>d/</u>	16.7
F101 (B1-B) engine	0	17.0	17.0	0	17.0
F109 (T-46A) engine	6.9	19.2	26.2	0	26.2
F110 (F-16C/D) engine	<u>0</u>	<u>60.3</u>	<u>60.3</u>	<u>0</u>	<u>60.3</u>
Totals	116.0	1027.9	1144.1	568.6	575.5

SOURCE: Congressional Budget Office.

- a. Based on actual data for prices except for aircraft workers' earnings, which are estimated.
- b. Based on CBO projections of future inflation.
- c. In this and other tables in this paper, details may not add to totals because of rounding.
- d. Additional cost incurred due to recorded EPA adjustments.

December 1985, while the last aircraft is scheduled to arrive in February 1989. Thus, actual EPA savings, based on prices prevailing when the contractor incurs his costs for labor and materials, may prove to be either higher or lower than these CBO estimates. Column three totals actual and expected savings for each system examined in this study.

Not all of the \$1.1 billion, however, represents savings from the Administration's 1986 defense budget. At least \$568.6 million of the amount has already been removed or reprogrammed. <sup>4/</sup> The data in the fourth column of Table 1 represent both prior-year appropriated funds that have been identified and released ("deobligated") by the system program office and funds that were removed from the 1986 budget request and future-year spending projections as a result of either recorded or anticipated savings. Deobligated funds are returned by the program office to the Air Force Comptroller, where they may be reprogrammed to support unanticipated costs in other programs or may simply lapse when spending authority expires. (CBO has not attempted to track the disposition of deobligated funds.) After making these adjustments, net savings of \$575 million for these specific programs appear to remain in the current budget plan.

---

4. It is possible that additional inflation-related savings reported by the DoD since the budget was submitted in February include savings from the programs examined in this study. CBO was unable to confirm this.

To test the sensitivity of these results to the CBO inflation projections, an alternative projection was developed for each index employing the annual rates of increase for 1985-1989 assumed for major weapons systems 5/ in the President's 1986 budget request (see Table 2). Contract savings under the Administration's assumptions total \$951.5 million, about 17 percent less than the estimate using CBO assumptions. (Table 3 displays

TABLE 2. ADMINISTRATION AND CBO PROJECTIONS FOR DEFENSE OUTLAY INFLATION RATES

Fiscal Year	DoD Major Weapons System Inflation	CBO	Difference
1985	4.8	4.0	0.8
1986	5.7	4.7	1.0
1987	5.5	5.4	0.1
1988	5.2	5.3	-0.1
1989	4.8	5.1	-0.3
1990	4.4	4.8	-0.4

SOURCES: Department of Defense, National Defense Budget Estimates for Fiscal Year 1986 (February 1985), Table 5-6, p. 50. CBO, The Economic and Budget Outlook: Fiscal Years 1986-1990 (February 1985), Table A-2, p. 125.

5. These include aircraft, missiles, ships, and other major weapons systems, which are budgeted assuming rates of inflation 30 percent greater than those used for the rest of the items DoD buys.

these savings by weapons system.) Even though the Administration's projected inflation rates are higher than CBO's in 1985 and 1986, they still permit substantial savings. In later years, the CBO projections actually exceed those used by the Administration.

The remainder of this paper discusses the methods used to project savings for these contracts, and presents the estimates for individual systems.

TABLE 3. ALTERNATIVE ESTIMATED TOTAL CONTRACT SAVINGS FROM EPA (Millions of dollars)

System	Based on CBO Inflation Projections	Based on DoD Inflation Projection	Difference (CBO-DoD)
C-5B	735.5 <u>a/</u>	616.5 <u>a/</u>	118.9
KC-10A	184.2	153.5	30.7
F-16A/B/C/D	108.5	99.4	9.1
T-46A	11.6	7.8	3.8
E-3A (aircraft only)	0.8	<u>b/</u>	0.8
F101 (B1-B) engine	17.0	8.5	8.5
F109 (T-46A) engine	26.2	24.2	2.0
F110 (F-16C/D) engine	<u>60.3</u>	<u>41.6</u>	<u>18.7</u>
Totals	1,144.1	951.5	192.5

SOURCE: Congressional Budget Office.

a. Includes \$439.6 million adjustment negotiated in 1984.

b. Less than \$50,000.

## CBO METHODOLOGY

---

CBO examined the specific EPA clauses contained in each contract. These vary in (a) the choice of labor and materials indexes on which the adjustment is based, (b) the year in which EPA adjustments are first performed, and (c) the exact procedure used to calculate the adjustment amount.

The first step was to identify the Bureau of Labor Statistics indexes used in the various contracts and project them through 1989. They included broad-based indexes such as the Consumer Price Index (CPI) and Producer Price Index for Industrial Commodities as well as highly specific price indexes for nonferrous metals such as cobalt, nickel, and titanium. The latter were typically combined by DoD into a composite weighted materials index, in which the weight assigned to each individual price series reflected the proportion of that metal used in the aircraft or engine.

CBO normally projects only broad-based indexes such as the CPI or the GNP deflator, for the purposes of its economic and budget outlook. Projections for the more specific items were made by relating the historical changes in the specific indexes to changes in the broad-based indexes, and using these relationships to generate projections through 1989. Where a composite index was involved, the composite index (rather than its individual components) was projected, using similar methods.

### Labor Index Projections

Table 4 shows the actual and projected percentage changes for the labor indexes. These represent average hourly earnings of production workers for various subsectors of the aerospace industry. All these indexes were increasing at more than 10 percent per year in 1980. By 1984, their annual rates of increase had declined to the 4 to 7 percent range.

TABLE 4. ACTUAL AND PROJECTED PERCENTAGE CHANGES IN LABOR WAGE INDEXES (Calendar years)

	Average Hourly Earnings of Production Workers				Consumer Price Index
	Aircraft (SIC 3721)	Aircraft Engines (SIC 3724)	Aircraft Parts and Accessories (SIC 3728)	Electrical Equipment Not Elsewhere Classified (SIC 3679)	
Actuals					
1980	13.8	10.6	12.5	12.9	13.4
1981	11.2	10.5	11.4	8.8	10.3
1982	10.3	7.2	8.7	8.5	6.0
1983	6.0	4.1	5.3	4.5	3.0
1984	(4.2) <u>a/</u>	6.7	5.6	2.1	3.5
CBO Projections					
1985	4.0	4.5	4.2	4.0	3.7
1986	4.8	3.5	4.8	4.7	4.5
1987	5.6	4.7	5.4	5.1	4.2
1988	5.9	5.0	6.0	5.5	4.2
1989	6.4	5.5	6.3	5.7	4.2

SOURCE: Bureau of Labor Statistics (for actuals).

a. CBO Projection. Actual index not available after November 1983.

A special problem has emerged with the index for average hourly earnings of workers in the aircraft industry (Standard Industrial Classification number 3721). The aircraft manufacturers have recently adopted the practice of paying large year-end bonuses. The Bureau of Labor Statistics excludes lump-sum bonuses from its measures of earnings, but the manufacturers argue that these are part of the industry's costs and that failure to include them would lead to less than full-cost recovery on the many commercial and government contracts indexed to this series. Several firms stopped reporting their data as a form of protest (participation in the survey is voluntary). As a result, the Bureau of Labor Statistics suspended publication of the series effective with November 1983 data, and the Air Force has been unable to calculate EPA savings based on this index. The CBO estimates of EPA savings for calendar year 1984 used a projection of this index; as a consequence, the estimated savings shown in the first column of Table 1 are not based entirely on actual data. 6/

#### Materials Index Projections

Rates of change for the materials indexes used for EPA are shown in Table 5. Since 1980, materials inflation rates have declined more markedly than

---

6. All the aircraft contracts except for the T-46A use this index. It is not used in the engine contracts.

wage inflation. Consequently, economic price adjustments for materials dominate the savings generated for these systems. The CBO projections for these indexes assume that by 1988 materials prices will be increasing again at rates consistent with overall inflation in the economy.

TABLE 5. ACTUAL AND PROJECTED PERCENTAGE CHANGES IN PRODUCER PRICE INDEXES (Calendar years)

	Industrial Commodities	Energy (PPI 05)	Metals and Metal Products (PPI 10)	Machinery and Equipment (PPI 11)	Foundry and Forge Shop Products (PPI 1015)
Actuals					
1980	16.2	40.6	10.5	12.1	11.9
1981	10.7	21.0	4.9	9.8	6.4
1982	2.7	-0.2	0.4	5.9	4.8
1983	1.1	-4.1	1.8	2.8	1.6
1984	2.1	-1.1	2.9	2.3	2.7
CBO Projections					
1985	1.7	-1.3	1.4	2.8	1.9
1986	3.2	1.0	3.4	4.0	3.3
1987	3.6	2.9	3.8	3.9	3.8
1988	3.9	4.2	4.2	4.0	4.4
1989	3.9	4.2	4.2	4.0	4.4

SOURCE: Bureau of Labor Statistics (for actuals).

Rates of increase for the composite indexes used in the F-16 airframe and General Electric engine contracts are shown in Table 6. The dramatic reduction in inflation in nonferrous metals prices is evident in the latter.

TABLE 6. ACTUAL AND PROJECTED PERCENTAGE CHANGES IN COMPOSITE MATERIALS INDEXES USED FOR SPECIFIC CONTRACTS

	F-16 Aircraft	GE engines <u>a/</u>
Actuals		
1980	12.3	27.1
1981	9.0	14.6
1982	2.0	-3.5
1983	1.2	-6.5
1984	3.2	-0.2
CBO Projections		
1985	2.5	1.1
1986	3.8	3.5
1987	4.0	3.6
1988	4.2	4.2
1989	4.2	4.2

SOURCE: Congressional Budget Office.

a. For the B-1B, F-15, and F-16 aircraft.

Computation of the Economic Price Adjustment

CBO's projected values were compared with those in the contract EPA clause to estimate the magnitude of the EPA savings. Table 7 shows an example of the computation of an EPA. Most contracts provide that no such

TABLE 7. CALCULATING THE EPA: AN EXAMPLE

Index: BLS Producer Price Index, Industrial Commodities (PPI-IC)  
Base Year: Fiscal year 1981

Fiscal Year	Contract Projection	Actual	Percentage Deviation
1981	1.000	1.000	--
1982	1.125	1.044	-7.16
1983	1.190	1.057	-11.14
1984	1.286	1.079	-16.10

Fiscal Year	Contract Cost Distribution <u>a/</u>	x	Percentage Deviation	=	EPA
1982	2,883		-7.16		-207
1983	24,573		-11.14		-2,741
1984	43,114		-16.10		-6,940

a. Contract cost distribution and EPA in thousands of dollars.

NOTE: EPA years represent the years in which costs are incurred, not program years.

adjustment will be made for the first two years of the contract. Cost distributions specified in the contract are used to allocate costs between labor and materials and among the years in which the cost is incurred.

## RESULTS FOR INDIVIDUAL SYSTEMS

---

The estimates below for individual weapons systems identify EPA savings that are expected to accrue annually over the lives of current contracts. In interpreting these results, the reader needs to keep several things in mind. First, EPA savings associated with 1984 and beyond depend on forecasts of inflation and are still uncertain. Also, the estimates are based on actual and expected outlays, not appropriations. In aircraft procurement, outlays based on a given fiscal year's appropriations of budget authority may be spent up to four years later. (The Air Force has three years to obligate the funds.) Thus, EPA savings from prior years' appropriations of budget authority are still uncertain to the degree that outlays have not yet been made.

Second, costs or EPA savings are associated with a "program" year. Funds for a program year represent the gross cost of systems authorized in that year, including any advanced procurement funds provided in earlier years, but excluding funds for advanced procurement for future years' programs. References to the Administration's request for a fiscal year

refer, as is customary, to the net funds requested, excluding advanced procurement funding previously provided. 7/

#### C-5B GALAXY Transport

The C-5B is a wide-bodied intertheater airlift aircraft that is designed to carry large bulky combat and support equipment over long distances. It is the only USAF aircraft capable of handling outsized pieces of equipment such as the M1 tank and 155mm self-propelled howitzer. The B version is physically similar to the A model originally procured in the late 1960s and early 1970s, but incorporates changes to remedy defects and improve reliability and maintainability.

The Administration has requested \$1,942.1 million in the fiscal year 1986 budget to purchase 16 aircraft and \$326 million in advance procurement for aircraft to be bought in fiscal year 1987. The planned fiscal year 1987 budget request is for \$2,196.8 million to fund 21 aircraft. CBO estimates that, because of EPA adjustments based on lower than anticipated rates of inflation, the aircraft requested in fiscal year 1986 will cost \$96.5 million less than the amount requested, while the funding requirement for

---

7. Whether funds were provided as long-lead or in the year of authorization is not especially relevant for prior-year authorizations, but does assume significance for the fiscal year 1986 and 1987 requests.

the fiscal year 1987 program can be reduced by \$122.5 million (see Table 8). Based on estimates of the distribution of fiscal year 1987 costs used in the contract, it appears that some \$14.1 million of the total \$122.5 million savings in the fiscal year 1987 program are associated with the long-lead items included in the fiscal year 1986 request.

In 1984, the C-5B contract was renegotiated to reduce the anticipated rates of inflation. This resulted in a total saving of \$439.6 million over the life of the contract (fiscal years 1983-1987). The savings discussed above for fiscal year 1986 and 1987 are based on the new contract escalation

TABLE 8. CBO ESTIMATES OF C-5B ECONOMIC PRICE ADJUSTMENTS BY PROGRAM YEAR (Millions of dollars)

Fiscal Year	Total	Previously Reported	Remaining Anticipated Adjustments
1983 (inc. startup)	-19.2	-8.9	-10.3
1984	-57.1	-36.7	-20.4
1985	-124.6	-78.5	-46.1
1986	-221.0	-124.5	-96.5
1987	<u>-313.5</u>	<u>-191.0</u>	<u>-122.5</u>
Total	<u>-735.5</u>	<u>-439.6</u>	<u>-295.9</u>

SOURCE: Aeronautical Systems Division, Air Force Systems Command, for previously reported data.

assumptions and are therefore over and above the \$439.6 million previously recorded.

Savings do not come only from the fiscal year 1986 and future budgets. CBO estimates that rates of inflation lower than the 5.6 percent rate now written into the contract will result in additional savings of \$76.8 million from the fiscal year 1983-1985 appropriations (see Table 8).

#### KC-10A Advanced Cargo-tanker Aircraft

The KC-10A aircraft, a derivative of the commercial DC-10, is produced by Douglas Aircraft Company. It can be used as an aerial tanker to refuel other aircraft or as a transport for oversize cargo (although it cannot carry outsized loads as the C-5B can). The Administration requested \$238.8 million to complete the acquisition of 12 aircraft in fiscal year 1986 and \$208.2 million in advanced procurement for 8 aircraft in fiscal year 1987. The fiscal year 1987 purchase will complete the acquisition program for this system.

CBO estimates EPA savings of \$184.2 million from the multiyear contract (see Table 9). Of this amount actual and anticipated savings of \$112.5 million have already been reported by the Air Force. Based on the CBO estimates of inflation, additional savings of \$28.9 million are anticipated for aircraft requested in the fiscal year 1986 program and savings of \$23.7 are expected for fiscal year 1987.

### F-16 Fighter

The F-16 fighter is a single-seat, single-engine, lightweight fighter aircraft capable of performing a wide spectrum of tactical warfare tasks. For program years 1982 through 1985, F-16s were procured through a multiyear contract with General Dynamics Corporation.

The Administration requested \$2,836.7 million in fiscal year 1986 for the purchase of 180 F-16C/D aircraft and \$553.1 million in long-lead money for the aircraft to be purchased in the fiscal year 1987 program. The status of the 1986 tactical aircraft program is currently under review by the Air Force and the Congress, and no contract or option currently applies to the

TABLE 9. CBO ESTIMATES OF KC-10A ECONOMIC PRICE ADJUSTMENTS BY PROGRAM YEAR (Millions of dollars)

Fiscal Year	Total	Previously Reported	Remaining Anticipated Adjustments
1983	-5.7	-5.2	-0.5
1984	-18.5	-12.4	-6.1
1985	-30.0	-17.5	-12.5
1986	-71.2	-42.3	-28.9
1987	-58.8	-35.1	-23.7
Total	-184.2	-112.5	-71.7

SOURCE: Aeronautical Systems Division, Air Force Systems Command, for previously reported data.

fiscal year 1986 request. Consequently, CBO has no basis for estimating overall EPA savings for the fiscal year 1986 request. However, the engine procurement for fiscal year 1986 received advance funding in fiscal year 1985. CBO estimates that a saving of \$24.3 million will be achieved on the GE engine procurement for the 1986 tactical fighter program (see F110 engine below); this will appear as a reduction in the F-16 program.

Table 10 shows CBO estimates of EPA savings from the existing multiyear contract for fiscal years 1982-1985. Total savings for the four years are \$108.5 million. These savings estimates are consistent with those reported by General Dynamics as part of its overall cost analysis for the

TABLE 10. CBO ESTIMATES OF F-16 ECONOMIC PRICE ADJUSTMENTS BY PROGRAM YEAR (Millions of dollars)

Fiscal Year	Total	Previously Reported	Remaining Anticipated Adjustments
1982	-3.1	-0.6	-2.5
1983	-18.0	-10.8	-7.2
1984	-35.5	-21.0	-14.5
1985	-51.8	--	-51.8
Total	-108.5	-32.4	-76.1

SOURCE: Aeronautical Systems Division, Air Force System Command, for previously reported data.

contract. To date, the F-16 program office has turned back \$32.4 million in EPA savings. CBO estimates that additional savings of \$76.1 million will eventually be recorded for this contract.

#### F110 (F-16) Engine

The F110-GE-100 engine is one of two engines chosen to power the Air Force's tactical fighters (F-15s and F-16s). The engine is produced by the General Electric Corporation. In 1985, 126 engines were purchased (75 percent of the F-16 requirement), and the Secretary of the Air Force has announced his intention to award General Electric 54 percent of the total tactical fighter engine purchase in fiscal year 1986 (186 engines).

In order to estimate EPA savings for the current contract, CBO assumed that the 1987 fighter engine requirement for 324 engines would be split evenly between GE and Pratt & Whitney. It was assumed that GE would receive 50 percent of the total fighter requirement (162 engines).

EPA savings from the production order for fiscal year 1986 are estimated at \$31.3 million. Of this amount, \$24.3 million are applicable as a reduction to the fiscal year 1986 F-16 request (see F-16 aircraft above), and the remaining \$7.0 million would appear as a reduction in funding for spares and trainers. An additional \$28.9 million would be saved from the 1987 request, if the quantity assumed by CBO proves correct. Using the same percentage for installed engines versus spares and trainers as was true in

1986, this would result in a \$22.4 million saving in F-16 procurement funding in fiscal year 1987.

#### T-46A Trainer Aircraft

The T-46A trainer aircraft will replace the T-37 in all USAF training roles as the primary jet trainer. A two-engine subsonic plane with side-by-side seating, the trainer will serve in the first stage of Air Force pilot training. The T-46A is being developed by the Fairchild Republic Company under a fixed-price-incentive contract with initial production options. It is currently ending the full development phase and entering initial production. An Air Force decision on full production is scheduled for October 1986.

The Congress authorized initial procurement of 10 aircraft in fiscal year 1985. The Administration requested \$142.8 million for 33 aircraft in fiscal year 1986 and \$63.3 million in advanced procurement funding for aircraft to be purchased in fiscal year 1987.

CBO estimates that a total of \$11.6 million will be saved from the current aircraft contract cost due to EPA. Of this total, \$3.3 million is associated with total development costs over 1982-1986, \$2.9 million with the fiscal year 1985 procurement program, and \$5.5 million with the fiscal year 1986 program. Additional savings of \$2.4 million in fiscal year 1985 and \$6.7 million in fiscal year 1986 may result from the engine contract (see F109 engine, below). No EPA adjustments have been made to date on the T-

46A program. The first proposed adjustment, which applies to calendar year 1984, is expected shortly from the contractor.

#### F109 (T-46A) Engine

The F109 engine, which will power the T-46A trainer, is produced by the Garrett Turbine Engine Company. The current contract is a development contract, with production options for 1985 and 1986. The Air Force has provided long-lead funding for the second production option in the fiscal year 1985 budget. Reductions in planned aircraft procurement have resulted in reduced engine requirements, and modifications to the contract are currently in negotiation. The calculations shown here are for 25 engines in production Option I (1985 program) and 74 engines in production Option II (1986 request).

CBO estimates that for the entire contract (including development work), EPA savings will total \$26.2 million. \$15.7 million of this total are associated with savings from development and initial contract support funding. Savings from procurement funding include \$2.4 million from the fiscal year 1985 T-46A aircraft program element, \$0.6 million from the fiscal year 1985 spares program element, \$6.7 million from the fiscal year 1986 T-46A procurement request, and \$0.8 million from the fiscal year 1986 spares request.

These savings may, however, not be realized. The EPA adjustment for production Option II represents over 25 percent of the cost base subject to adjustment. This is the highest percentage of any contract CBO examined. A provision of the contract permits Garrett to petition for relief from the EPA clause on the basis that the prices it actually pays have deviated from the behavior of the Producer Price Index for Industrial Commodities (to which the EPA adjustment is tied and which CBO used to estimate EPA savings). Garrett has notified the Air Force that it intends to seek such relief and will submit data to support its request.

#### F101 (B-1B) Engine

The F101-GE-102 engine that powers the B-1 bomber is produced by the General Electric Corporation. The current engine contract (for fiscal year 1984 with options for 1985 and 1986) procures 428 engines, of which 368 are for installation in the aircraft, 59 are spares (funded separately in the budget), and one is for an engine to be used in the B-1B Component Improvement Program (also funded separately in the R&D budget).

CBO estimates that a total of \$17.0 million dollars in EPA savings will accrue over the life of this contract. Of that total, \$5.9 million are associated with the fiscal year 1985 program and \$11.1 million with the fiscal year 1986 acquisition program (no EPA adjustment applies for the fiscal year 1984 program).

As was true for the other engines discussed above, these savings will appear in various parts of the budget. For fiscal year 1985, \$5.6 million of the savings will apply to the propulsion element of the B-1B program and \$0.3 million to the spares program element of the aircraft procurement appropriation. For the fiscal year 1986 request, CBO calculates that \$8.8 million of savings will accrue to the B-1B request, while the remaining \$2.3 million will apply to the spares program.

#### NATO E-3A AWACS Aircraft

The AWACS is an airborne surveillance, command, control, and communications system, consisting of specialized avionics and a large surveillance radar installed in a modified Boeing 707 aircraft. Eighteen E-3A AWACS aircraft were procured over 1976-1983 to provide airborne warning and control for NATO forces. Boeing Aircraft Company was the prime contractor. Forty-two percent of this program was funded by the U.S. Air Force, with the other members of NATO contributing the balance of costs. The last of the 18 aircraft was recently delivered to NATO forces.

In addition to the airframe and engines, many of the subcontracts for the elements of the AWACS system also incorporated EPAs; these adjustments were passed through by Boeing as adjustments to total contract cost. CBO has estimated values for EPA adjustment only for the aircraft.

These estimates result in a small net savings of \$800,000 for the 18 aircraft, as positive adjustments for the earlier years of the contract cancel out savings in 1984-1985. The program office has reported a positive EPA adjustment of \$15.9 million as of January 1985. It can only be presumed that this results from subcontractor EPA adjustments not accounted for by CBO.