

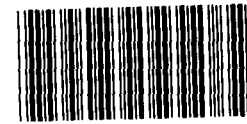
GAO

United States General Accounting Office
Fact Sheet for Congressional
Requesters

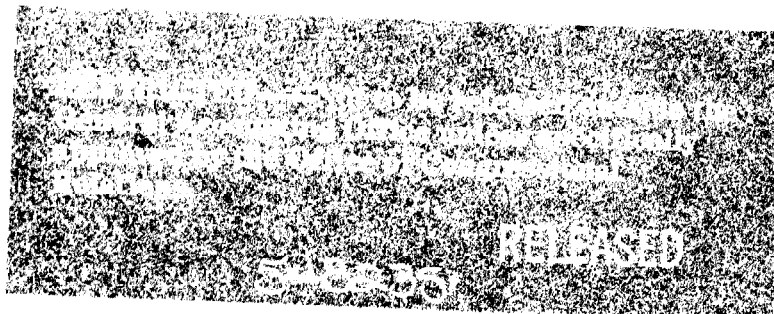
April 1990

AIR FORCE ADP
PROCUREMENT

Contracting and
Market Share
Information



141283



Information Management and
Technology Division

B-238745

April 9, 1990

The Honorable John Conyers, Jr.
Chairman, Committee on Government Operations
House of Representatives

The Honorable Frank Horton
Ranking Minority Member, Committee on
Government Operations
House of Representatives

This report responds to your February 1989 requests for a comprehensive review of federal agencies' compatible computer procurements.¹ In your initial requests and in subsequent discussions with your offices, we were asked to answer several specific questions about agencies' procurements of mainframe computers and mainframe peripheral equipment. Your questions focused on identifying the extent to which agencies' procurements of mainframe computers and mainframe peripherals required compatibility with International Business Machines (IBM) or any other computer manufacturer. You were also interested in knowing details such as the identification of manufacturers whose equipment was acquired by each agency and the procurement methods used to obtain equipment.

In addition to this report on the Air Force, we previously reported similar information on the Navy (including the Marine Corps)² and the Army.³ Information on the remaining 31 agencies we included in our review will be reported after we have fully analyzed the procurement data we collected from them.

Results in Brief

The information we obtained from the Air Force shows that during the 3 1/2 fiscal years ending in March 1989, 98 percent of the Air Force's

¹A compatible procurement requires hardware or software that functions like specified or existing hardware or software, with little or no modification. Competition in such procurements may occur between manufacturers and marketers—such as system developers and system integrators—to supply equipment that meets the compatible requirements. Because of the potential for competition between manufacturers and marketers, a compatible procurement does not necessarily result in the award of a sole source contract.

²NAVY ADP PROCUREMENT: Contracting and Market Share Information (GAO/IMTEC-89-66FS, Sept. 15, 1989).

³ARMY ADP PROCUREMENT: Contracting and Market Share Information (GAO/IMTEC-90-28FS, Mar. 1, 1990).

procurements for mainframes and mainframe peripherals required compatibility. The Air Force required Unisys compatibility in 478 (62 percent) and IBM compatibility⁴ in 211 (27 percent) of its 777 compatible procurements. Of the 88 remaining compatible procurements, the Air Force required that 59 have Honeywell Bull compatibility while 29 required Control Data Corporation compatibility. When we used dollars for comparison—as opposed to the number of procurements—we found that the Air Force obligated \$165.5 million (47 percent) to IBM-compatible procurements and \$138 million (40 percent) to Unisys-compatible procurements from total obligations for compatible procurements of \$348.8 million. When the Air Force's procurements required IBM compatibility, IBM equipment was supplied in 122 of those 211 IBM-compatible procurements (58 percent). Overall, Unisys equipment was supplied for more Air Force mainframe and mainframe peripheral procurements than any other manufacturer's equipment—measured in either number of procurements or dollars.

As requested in discussions with your offices, we also obtained information from the Air Force on the procurement methods it used, including the Air Force's use of contractors that participated in the Small Business Administration's program for small disadvantaged businesses—known as 8(a) contractors. Additionally, we collected information on the Air Force's procurements performed under the Warner Amendment (10 U. S. C. 2315), which exempts the Department of Defense from General Services Administration (GSA) oversight when procuring certain military-related automated data processing (ADP) resources. The detailed questions you asked and our answers are summarized in appendix I. Appendix II contains tables with detailed statistics that are the basis for our answers to your questions.

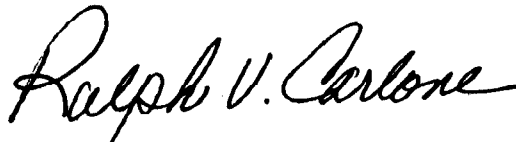
We are reporting information for the 3 1/2 fiscal years from October 1, 1985 through March 31, 1989. All the information is based on the Air Force's response to a questionnaire we devised and distributed to 35 agencies. We did not independently validate the information, which the Air Force supplied in September 1989, nor did we evaluate any documentation related to individual Air Force procurements. However, we

⁴Since several companies manufacture and market IBM-compatible equipment, competition in IBM-compatible procurements may occur among a variety of manufacturers and marketers. However, there are few if any companies that manufacture equipment compatible with Control Data Corporation, Honeywell Bull, or Unisys. As a result, competition in procurements requiring Control Data Corporation, Honeywell Bull, or Unisys compatibility generally occurs only among the manufacturer of the required equipment and companies marketing that manufacturer's equipment.

checked the Air Force's information for consistency with the instructions for our questionnaire and made the necessary revisions. At your request, we did not solicit or obtain comments from the Air Force on this report. Appendix III contains additional details on the objective, scope, and methodology of our work.

As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. We will then send copies to the Secretary of Defense and the Secretary of the Air Force, and will also make copies available to others upon request.

This information was compiled under the direction of Jack L. Brock, Jr., Director, Government Information and Financial Management, who can be contacted at (202) 275-3195, should you require additional information. Other major contributors to this report are listed in appendix IV.



Ralph V. Carlone
Assistant Comptroller General

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Abbreviations

ADP	automated data processing
GAO	General Accounting Office
GSA	General Services Administration
IBM	International Business Machines
IMTEC	Information Management and Technology Division

Questions and Answers About Air Force Procurements

What are the numbers and dollar amounts of the Air Force's mainframe and mainframe peripheral procurements requiring compatibility and is there any trend toward the increased use of compatible procurements?

The Air Force had a total of 795 procurements and obligated a total of \$384.5 million for mainframe computers and mainframe peripherals during the 3 1/2 fiscal years ending in March 1989. According to Air Force statistics, compatible procurements comprised 777 of the Air Force's 795 total procurements, representing \$348.8 million of the \$384.5 million obligated. In each of the 3 1/2 fiscal years ending in March 1989—using the Air Force's number of procurements as a measure—the percentage of compatible procurements versus other procurements was 96 percent or higher. For the same time period, the percentage of dollars obligated to compatible procurements versus other procurements was 75 percent or higher in each year. Since the Air Force's statistics indicate a consistently high percentage of compatible procurements, there was no trend toward increased compatible procurements.

Appendix I
 Questions and Answers About Air
 Force Procurements

Figure I.1: Number of Air Force
 Mainframe and Mainframe Peripheral
 Procurements

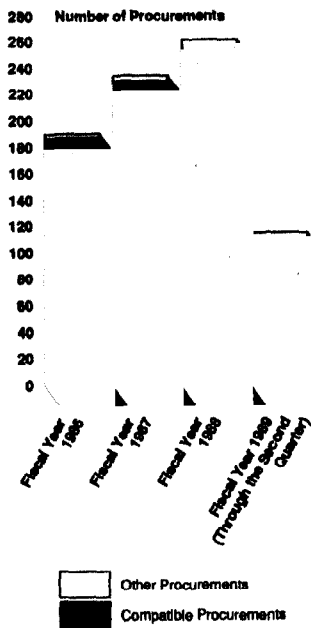
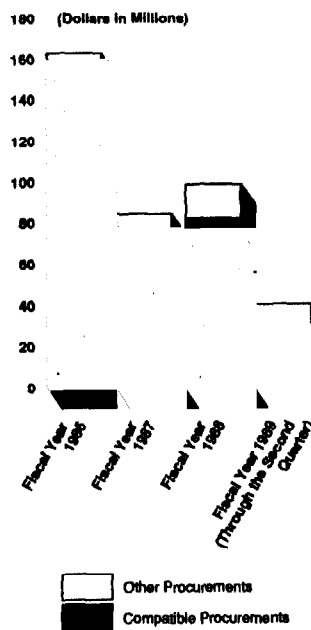


Figure I.2: Dollars for Air Force
 Mainframe and Mainframe Peripheral
 Procurements



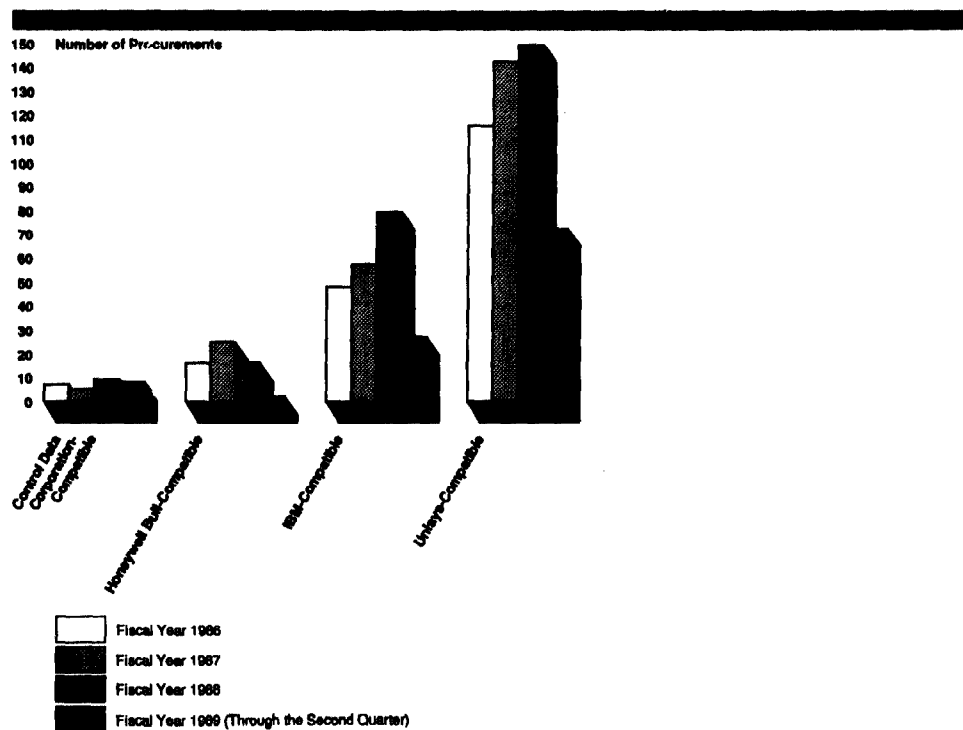
**Appendix I
Questions and Answers About Air
Force Procurements**

What is the distribution of the Air Force's compatible mainframe and mainframe peripheral procurements according to type of compatibility?

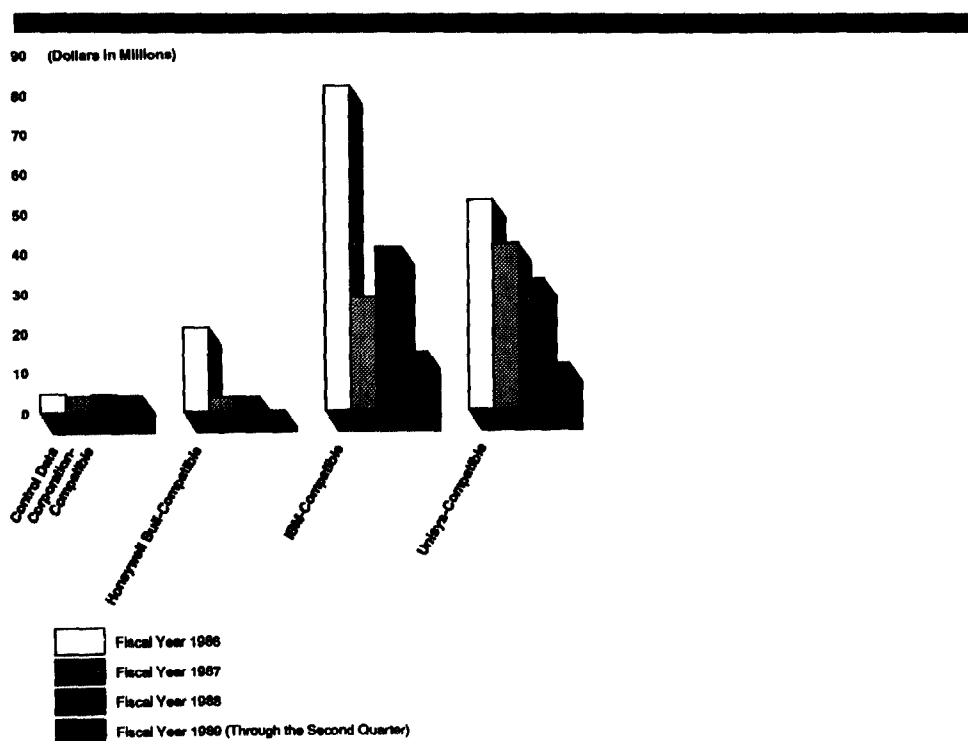
Those procurements that the Air Force identified as having a compatible requirement were for either Control Data Corporation, Honeywell Bull, IBM, or Unisys compatibility. Specifically, 478 of the 777 procurements were to satisfy Unisys-compatible requirements representing \$138 million of the \$348.8 million obligated for all compatible procurements. Further, IBM-compatible requirements represented 211 of the 777 procurements and \$165.5 million of the obligations. Procurements to meet Honeywell Bull-compatible requirements accounted for 59 of the compatible procurements and \$28.4 million of the obligations, while 29 Control Data Corporation-compatible procurements represented \$16.9 million of the obligations for compatible mainframe and mainframe peripheral procurements by the Air Force.

**Appendix I
Questions and Answers About Air
Force Procurements**

**Figure I.3: Number of Air Force
Compatible Procurements According to
Type of Compatibility**



**Figure I.4: Dollars for Air Force
Compatible Procurements According to
Type of Compatibility**



What equipment manufacturers are involved in the Air Force's IBM-compatible mainframe and mainframe peripheral procurements?

The Air Force obtained IBM equipment in the majority of its IBM-compatible procurements during fiscal years 1986 through 1989 (through the second quarter). Of the 211 IBM-compatible procurements, 122 (58 percent) resulted in the Air Force obtaining IBM equipment. Similarly, of the \$165.5 million obligated to IBM-compatible procurements, \$99.7 million (60 percent) was used in procurements involving IBM equipment.

**Appendix I
Questions and Answers About Air
Force Procurements**

Figure I.5: Number of Air Force IBM-Compatible Procurements According to Manufacturer of Equipment

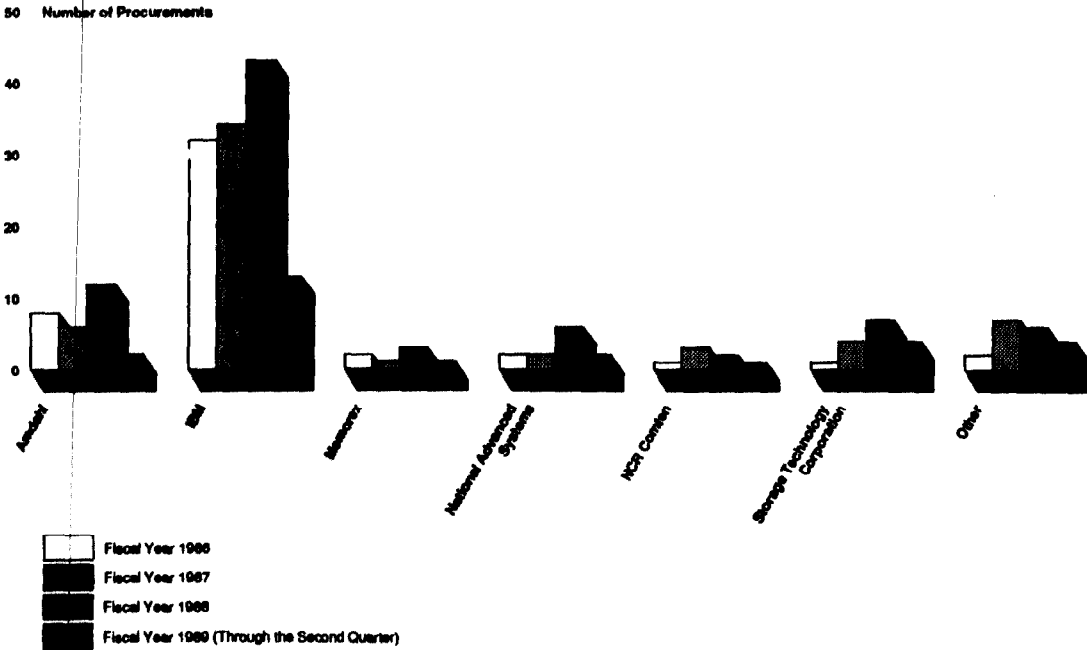
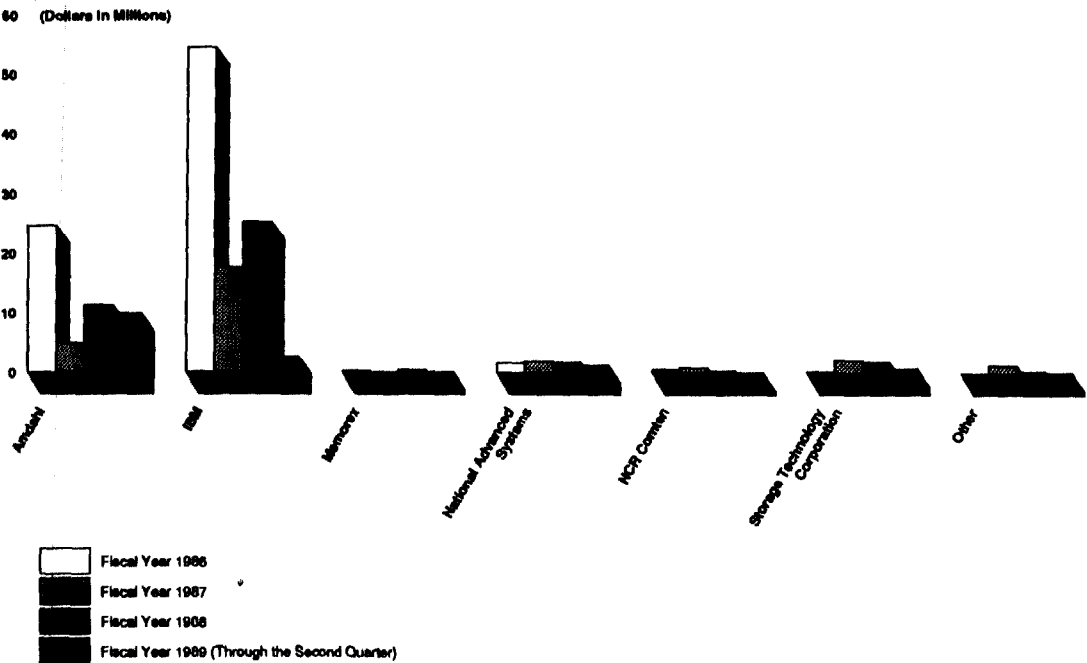


Figure I.6: Dollars for Air Force IBM-Compatible Procurements According to Manufacturer of Equipment



**Appendix I
Questions and Answers About Air
Force Procurements**

What procurement methods were used to obtain all types of compatible mainframe computers and mainframe peripheral equipment? And, did the Air Force frequently use new contracts with 8(a) contractors to obtain compatible mainframes and mainframe peripherals?

Using either the number of procurements or dollar obligations as a measure, the Air Force most frequently used modifications to existing contracts as the procurement method to obtain equipment when compatible requirements were identified. These contract modifications accounted for 606 of 777 compatible procurements and \$241.6 million of \$348.8 million obligated. New contracts with 8(a) firms were used by the Air Force in 2 of 777 compatible procurements.

Appendix I
 Questions and Answers About Air
 Force Procurements

Figure I.7: Number of Air Force Compatible Procurements According to Procurement Method

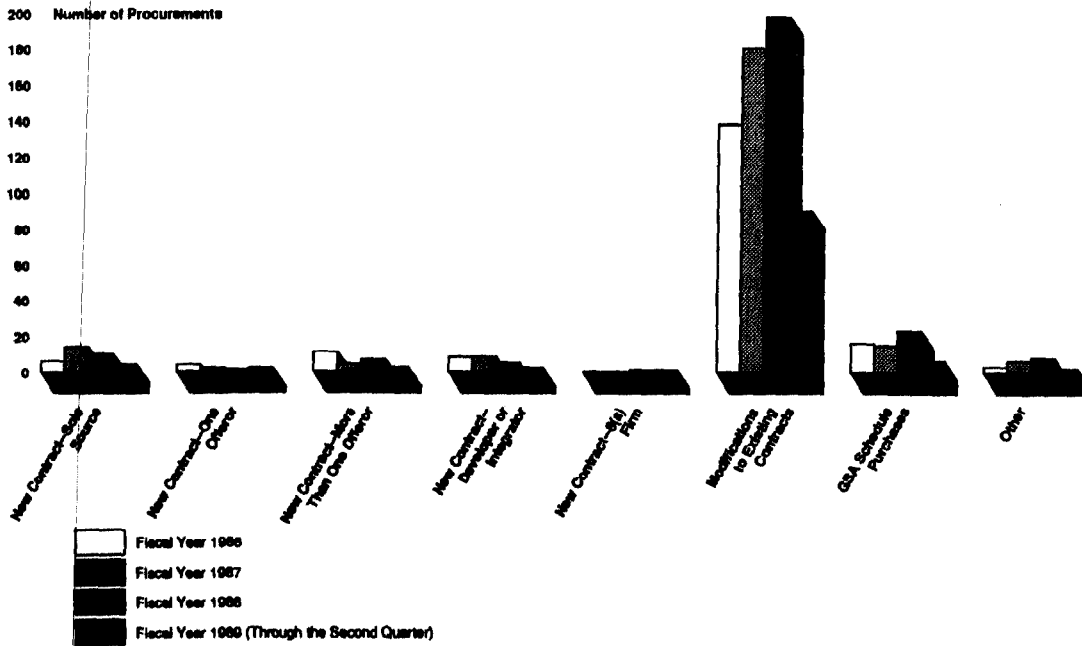
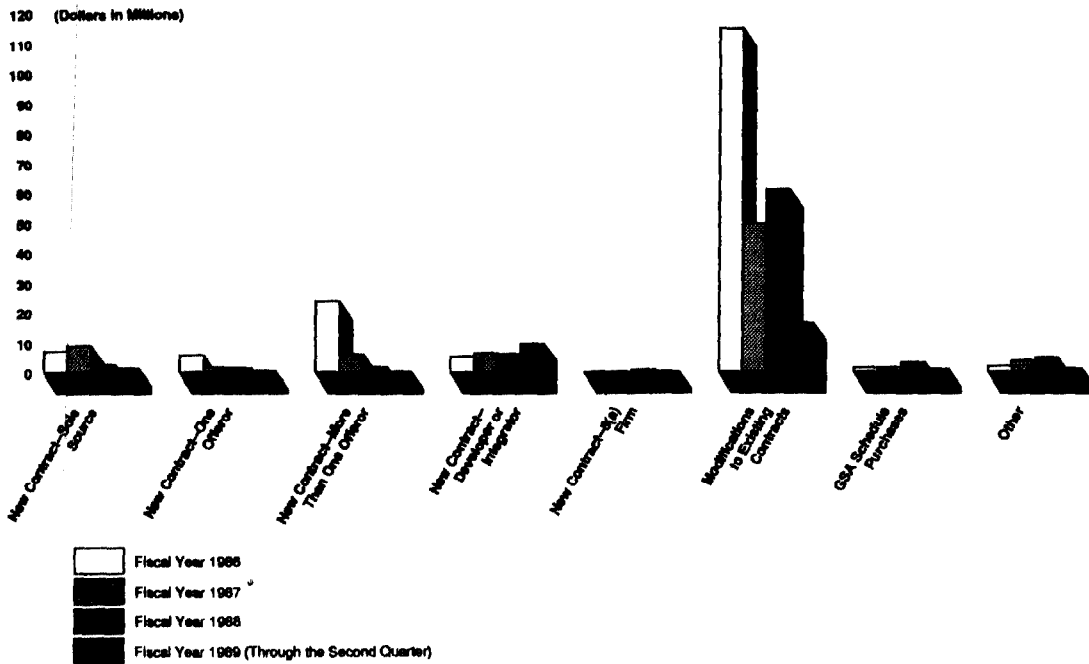


Figure I.8: Dollars for Air Force Compatible Procurements According to Procurement Method



**Appendix I
Questions and Answers About Air
Force Procurements**

What procurement methods were used to obtain IBM-compatible mainframe computers and mainframe peripheral equipment? And, did the Air Force frequently use new contracts with 8(a) contractors to obtain IBM-compatible mainframes and mainframe peripherals?

Using either the number of procurements or dollar obligations as a measure, the Air Force most frequently used modifications to existing contracts as the procurement method to obtain IBM-compatible equipment. Such contract modifications accounted for 94 of 211 IBM-compatible procurements and \$103.8 million of \$165.5 million obligated. New contracts with 8(a) firms were used by the Air Force in 2 of 211 IBM-compatible procurements.

Appendix I
 Questions and Answers About Air
 Force Procurements

Figure I.9: Number of Air Force IBM-Compatible Procurements According to Procurement Method

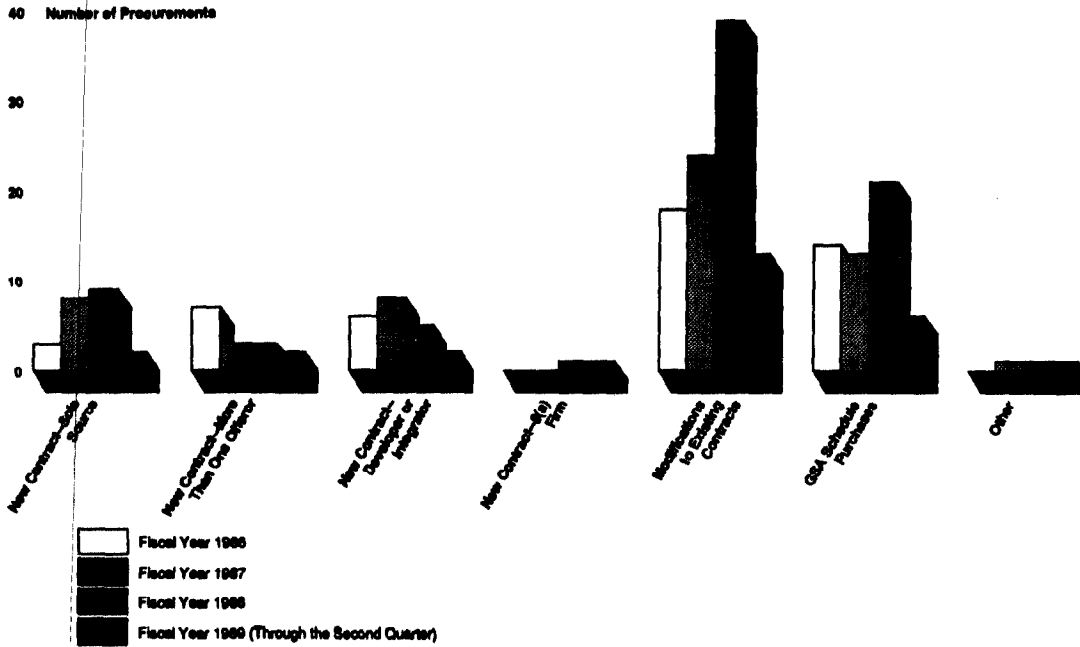
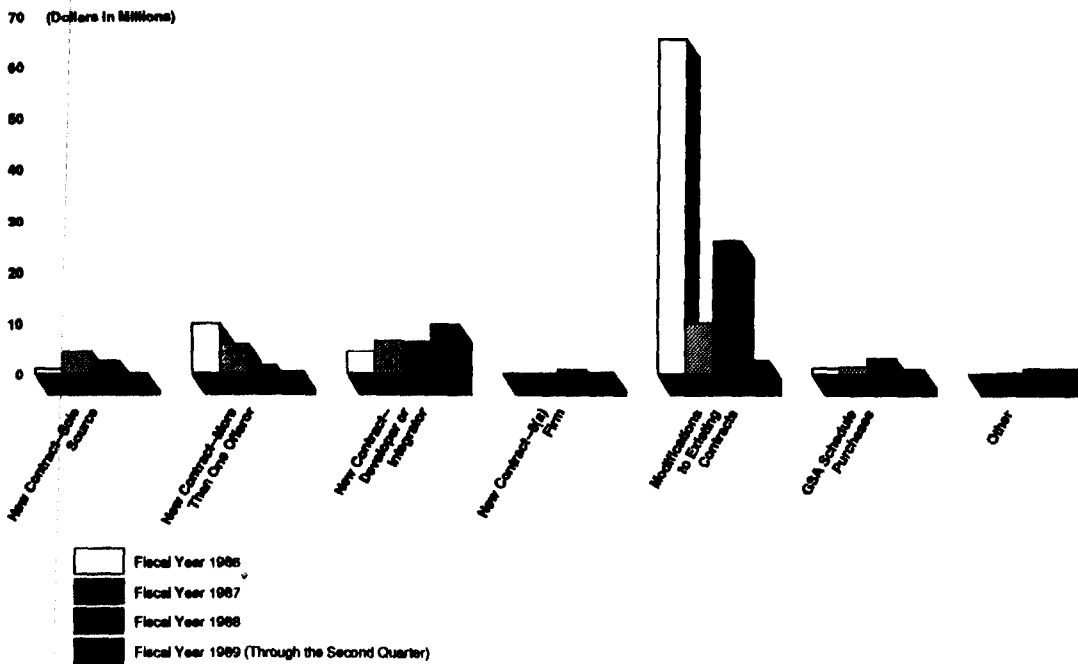


Figure I.10: Dollars for Air Force IBM-Compatible Procurements According to Procurement Method



**Appendix I
Questions and Answers About Air
Force Procurements**

What equipment manufacturers are involved in the Air Force's mainframe and mainframe peripheral procurements, including both procurements where compatibility is required and procurements with no compatibility requirement?

Unisys equipment was most frequently supplied to the Air Force for mainframe and mainframe peripheral procurements in each of fiscal years 1986 through 1988 and for the first half of fiscal year 1989, with 483 out of 795 total procurements. Additionally, using obligated dollars as the measure, the Air Force's obligations for Unisys equipment during the same 3 1/2 year period were \$142.3 million of a total of \$384.5 million. IBM was the manufacturer whose equipment was second most frequently supplied to the Air Force, with 130 procurements representing \$124.8 million of \$384.5 million in total obligations during the 3 1/2 year period. Amdahl, Control Data Corporation, Honeywell Bull, National Advanced Systems, and Storage Technology Corporation are also among those companies whose equipment was supplied to the Air Force during the 3 1/2 years.

Appendix I
 Questions and Answers About Air
 Force Procurements

Figure I.11: Number of Air Force Mainframe and Mainframe Peripheral Procurements According to Manufacturer of Equipment

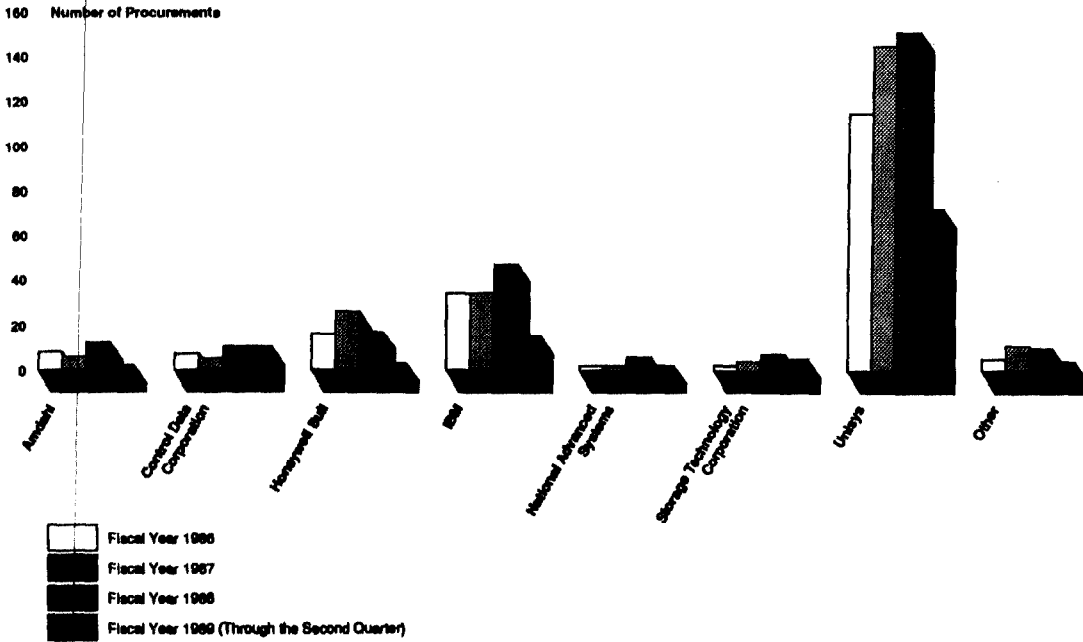
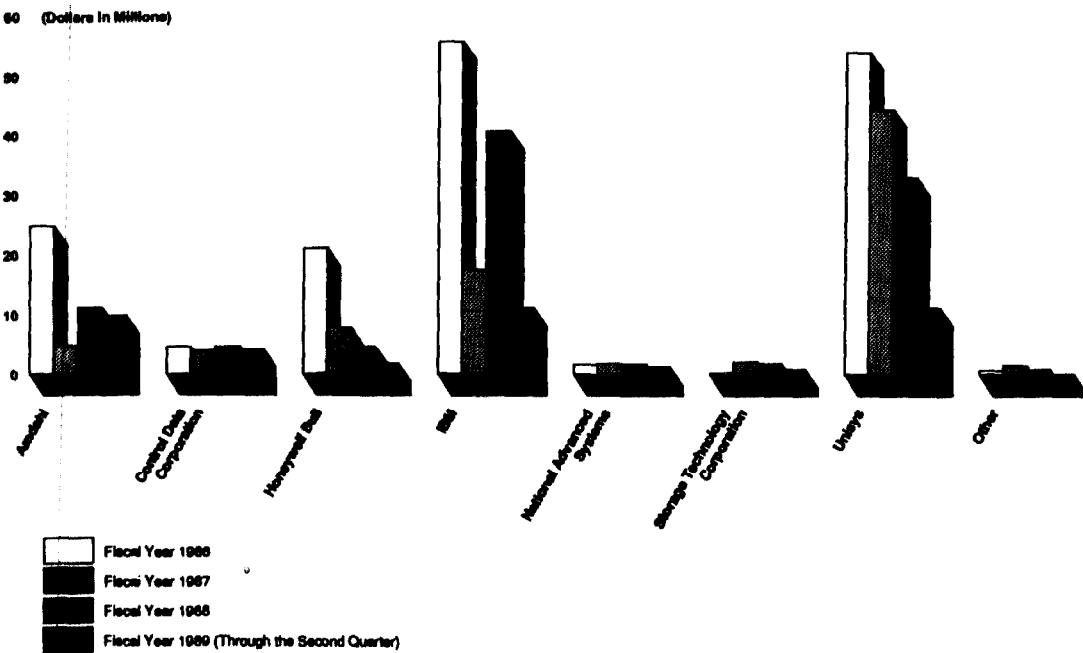


Figure I.12: Dollars for Air Force Mainframe and Mainframe Peripheral Procurements According to Manufacturer of Equipment



**Appendix I
Questions and Answers About Air
Force Procurements**

To what extent has the Air Force procured mainframe computers and mainframe peripheral equipment under the Warner Amendment?

Out of the Air Force's total of 795 procurements for mainframe computers and mainframe peripherals, 122 procurements representing \$95 million in obligations were conducted under the Warner Amendment. Of those 122 procurements under the Warner Amendment, 112 were compatible procurements. Those 112 procurements represented \$84 million in obligations.

Detailed Statistics on Air Force Procurements

Table II.1: Air Force Mainframe and Mainframe Peripheral Procurements

Dollars in Millions

	Fiscal Year 1986		Fiscal Year 1987		Fiscal Year 1988		Fiscal Year 1989 ^a		Total	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Compatible	186	\$159.6	229	\$77.5	253	\$81.7	109	\$30.0	777	\$348.8
Other	3	2.7	4	6.3	7	16.7	4	10.0	18	35.7
Total	189	\$162.3	233	\$83.8	260	\$98.4	113	\$40.0	795	\$384.5
Compatible Percent of Total	98%	98%	98%	92%	97%	83%	96%	75%	98%	91%

^aFiscal year 1989 through the second quarter.**Table II.2: Air Force Compatible Procurements According to Type of Compatibility**

Dollars in Millions

	Fiscal Year 1986		Fiscal Year 1987		Fiscal Year 1988		Fiscal Year 1989 ^a		Total	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Control Data Corporation-Compatible	7	\$4.6	5	\$3.9	9	4.4	8	\$4.0	29	\$16.9
Honeywell Bull-Compatible	16	21.0	25	3.6	16	3.6	2	0.2	59	28.4
IBM-Compatible	48	81.5	57	28.4	79	41.0	27	14.6	211	165.5
Unisys Compatible	115	52.5	142	41.6	149	32.7	72	11.2	478	138.0
Total	186	\$159.6	229	\$77.5	253	\$81.7	109	\$30.0	777	\$348.8

^aFiscal year 1989 through the second quarter.**Table II.3: Air Force IBM-Compatible Procurements According to Manufacturer of Equipment**

Dollars in Millions

	Fiscal Year 1986		Fiscal Year 1987		Fiscal Year 1988		Fiscal Year 1989 ^a		Total	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Amdahl	8	\$24.7	6	\$4.9	12	\$11.2	2	\$9.8	28	\$50.6
IBM	32	54.3	34	17.5	43	25.3	13	2.6	122	99.7
Memorex	2	0.2	1	b	3	0.5	1	0.1	7	0.8
National Advanced Systems	2	1.6	2	1.8	6	1.7	2	1.2	12	6.3
NCR Comten	1	0.5	3	0.8	2	0.2	1	b	7	1.5
Storage Technology Corporation	1	0.2	4	2.1	7	1.8	4	0.8	16	4.9
Other	2	b	7	1.3	6	0.3	4	0.1	19	1.7
Total	48	\$81.5	57	\$28.4	79	\$41.0	27	\$14.6	211	\$165.5

^aFiscal year 1989 through the second quarter.^bLess than \$50,000.

**Appendix II
Detailed Statistics on Air Force Procurements**

Table II.4: Air Force Compatible Procurements According to Procurement Method

Dollars in Millions

	Fiscal Year 1986		Fiscal Year 1987		Fiscal Year 1988		Fiscal Year 1989 ^a		Total	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
New Contract—Sole Source	6	\$7.2	14	\$8.9	10	\$2.6	4	\$1.2	34	\$19.9
New Contract—One Offeror	4	5.7	2	1.4	1	1.3	2	0.3	9	8.7
New Contract—More Than One Offeror	11	23.4	4	5.9	7	1.8	2	0.3	24	31.4
New Contract—Developer or Integrator	8	5.2	8	6.5	5	6.3	2	9.6	23	27.6
New Contract—8(a) Firm	0	0.0	0	0.0	1	0.7	1	0.2	2	0.9
Modifications to Existing Contracts	138	114.8	180	49.6	198	60.9	90	16.3	606	241.6
GSA Schedule Purchases	16	1.3	15	1.3	23	3.2	6	0.8	60	6.6
Other	3	2.0	6	3.9	8	4.9	2	1.3	19	12.1
Total	186	\$159.6	229	\$77.5	253	\$81.7	109	\$30.0	777	\$348.8

^aFiscal year 1989 through the second quarter.

Table II.5: Air Force IBM-Compatible Procurements According to Procurement Method

Dollars in Millions

	Fiscal Year 1986		Fiscal Year 1987		Fiscal Year 1988		Fiscal Year 1989 ^a		Total	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
New Contract—Sole Source	3	\$0.9	8	\$4.5	9	\$2.5	2	b	22	\$7.9
New Contract—More Than One Offeror	7	9.8	3	5.9	3	1.6	2	0.4	15	17.7
New Contract—Developer or Integrator	6	4.4	8	6.5	5	6.3	2	9.6	21	26.8
New Contract—8(a) Firm	0	0.0	0	0.0	1	0.7	1	0.2	2	0.9
Modifications to Existing Contracts	18	65.3	24	10.0	39	25.9	13	2.6	94	103.8
GSA Schedule Purchases	14	1.1	13	1.3	21	3.0	6	0.8	54	6.2
Other	0	0.0	1	0.2	1	1.0	1	1.0	3	2.2
Total	48	\$81.5	57	\$28.4	79	\$41.0	27	\$14.6	211	\$165.5

^aFiscal year 1989 through the second quarter.

^bLess than \$50,000.

**Appendix II
Detailed Statistics on Air Force Procurements**

Table II.6: Air Force Mainframe and Mainframe Peripheral Procurements According to Manufacturer of Equipment

Dollars in Millions

	Fiscal Year 1986		Fiscal Year 1987		Fiscal Year 1988		Fiscal Year 1989 ^a		Total	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Amdahl	8	\$24.7	6	\$4.9	12	\$11.2	2	\$9.8	28	\$50.6
Control Data Corporation	7	4.6	5	3.9	10	4.6	10	4.1	32	17.2
Honeywell Bull	16	21.0	26	7.8	17	4.7	3	1.7	62	35.2
IBM	34	55.6	34	17.5	47	40.6	15	11.1	130	124.8
Memorex ^c	2	0.2	1	b	3	0.5	1	0.1	7	0.8
National Advanced Systems	2	1.6	2	1.8	6	1.7	2	1.2	12	6.3
NCR Comten ^c	1	0.5	3	0.8	2	0.2	1	b	7	1.5
Storage Technology Corporation	2	0.2	4	2.1	7	1.8	5	0.8	18	4.9
Unisys	115	53.9	145	44.3	151	32.9	72	11.2	483	142.3
Other	2	b	7	0.7	5	0.2	2	b	16	0.9
Total	189	\$162.3	233	\$83.8	260	\$98.4	113	\$40.0	795	\$384.5

^aFiscal year 1989 through the second quarter.

^bLess than \$50,000.

^cIncluded in Other on Figure I.11 and Figure I.12.

Table II.7: Air Force Mainframe and Mainframe Peripheral Procurements Under the Warner Amendment

Dollars in Millions

	Fiscal Year 1986		Fiscal Year 1987		Fiscal Year 1988		Fiscal Year 1989 ^a		Total	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Compatible	27	\$52.6	38	\$8.4	38	\$21.6	9	\$1.4	112	\$84.0
Other	2	1.7	3	6.2	4	1.6	1	1.5	10	11.0
Total	29	\$54.3	41	\$14.6	42	\$23.2	10	\$2.9	122	\$95.0

^aFiscal year 1989 through the second quarter.

Objective, Scope, and Methodology

In February 1989 we were requested by the Chairman and the Ranking Minority Member, House Committee on Government Operations, to perform a comprehensive review of the government's use of IBM-compatible ADP procurements. In response to the requests and in discussions with the Chairman's and Ranking Minority Member's offices, we agreed that procurements of mainframes and mainframe peripherals would be included in our review, with emphasis on compatible procurements. Our review covered procurements during the 3 1/2 fiscal years ending in March 1989, at 35 federal agencies.

Our primary objective was to obtain and analyze information on specific aspects of each agency's ADP-related procurements. This report focuses on the Air Force and includes the number and aggregate dollar value of the Air Force's mainframe-related contracts, distribution of procurements among equipment manufacturers, information on use of the Warner Amendment in mainframe-related procurements, and breakdown of various procurement methods the Air Force used to obtain mainframe-related equipment.

We used the following mutually exclusive procurement methods to group the Air Force's procurements. The first three methods represent specific types of new contracts with mainframe and peripheral equipment manufacturers. These consist of sole source new contracts, new contracts that resulted from competitive procedures where only one offeror remained in the procurement at the time the awardee was selected, and new contracts that resulted from competitive procedures where the awardee was selected from among multiple competitors. We also included a category for new contracts with developers and integrators that identified new contracts with companies that create systems using equipment manufactured by others—except those contracts separately categorized as awarded to 8(a) firms. Data on the Air Force's modifications to existing contracts; use of GSA's multiple award schedule contracts; and other miscellaneous procurement methods were also obtained and analyzed.

To accomplish our objective and facilitate the Air Force's information gathering, we designed a questionnaire which, when properly completed by the Air Force, provided us with the necessary information. Our questionnaire included several charts and provided detailed instructions, with definitions and examples, to help the Air Force identify and report the relevant information. Our questionnaire instructions cited pertinent federal regulations to ensure consistency in understanding of the terms used and to identify key definitions.

In preparing instructions for our questionnaire, we recognized the need to clearly and consistently identify mainframe computers, as opposed to superminicomputers and supercomputers. Because technology changes, criteria such as storage capacity, processing speed, physical size, cooling requirements, and cost do not provide an adequate basis for clear and consistent identification of mainframes. Therefore, after consulting with computer vendors, GSA, other federal agency officials, and Datapro,⁵ we considered vendor marketing strategy—in addition to computer architecture and performance—as the basis for classifying particular computers as superminicomputers, mainframes, or supercomputers. Like Datapro, we classified as mainframes some smaller and less expensive models if they belong to a product line, or family, of mainframes sharing a common architecture or operating system. However, models with similar performance characteristics that do not belong to a mainframe family and are manufactured by companies that are not traditionally recognized as mainframe manufacturers were not classified as mainframes. We provided a list of mainframe manufacturers and models in the instructions for our questionnaire as examples of computers that agencies should include in completing the questionnaire.

We obtained comments on preliminary copies of our questionnaire from information resources management officials at the Departments of Agriculture and Transportation to aid in ensuring the questionnaire's clarity. After modifying the questionnaire based on comments received from officials at the Departments of Agriculture and Transportation, we asked the senior information resources management officials at the Air Force and 34 other federal agencies to complete the questionnaire.

Our questionnaire was furnished to the Air Force in mid-April 1989. Upon receiving the Air Force's response in September 1989, the information was reviewed to determine if the instructions were followed correctly and if the information was clear and consistent. Although we did not independently validate the information supplied in the Air Force response, our questionnaire contained several internal checks to determine if inconsistencies were present. In some situations we modified the data on the basis of discussions with Air Force officials. In other cases we excluded inappropriate data. For example, we directed the agencies to include only procurement data for mainframe-related equipment. However, in a few instances, the Air Force included procurements for computers other than mainframes. In order to maintain consistency in

⁵Datapro is a trade publication that provides detailed information on computers, peripheral equipment, and software.

Appendix III
Objective, Scope, and Methodology

the statistics across the 35 federal agencies, any procurements reported by the Air Force for equipment other than mainframes and related peripherals were deleted from our analysis. Our work did not include solicitation or evaluation of documents related to the Air Force's individual procurements. The figures and tables in appendixes I and II were developed from our analysis.

We did not solicit or obtain comments from the Air Force about this report, however, we discussed our scope and methodology with Air Force officials in February 1990. Our review was conducted from February 1989 through February 1990. Discussions were held with Air Force officials at the Pentagon and at GAO headquarters. Additionally, meetings were conducted with the Department of Agriculture, the Department of Transportation, and the General Services Administration in Washington, D.C. Our work was performed in accordance with generally accepted government auditing standards.

Major Contributors to This Report

**Information
Management and
Technology Division,
Washington, D.C.**

**Mark E. Heatwole, Assistant Director
Mark T. Bird, Evaluator-in-Charge
Darlene D. Rush, Evaluator
Charles S. Stanley, Evaluator
Peter C. Wade, Evaluator**

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