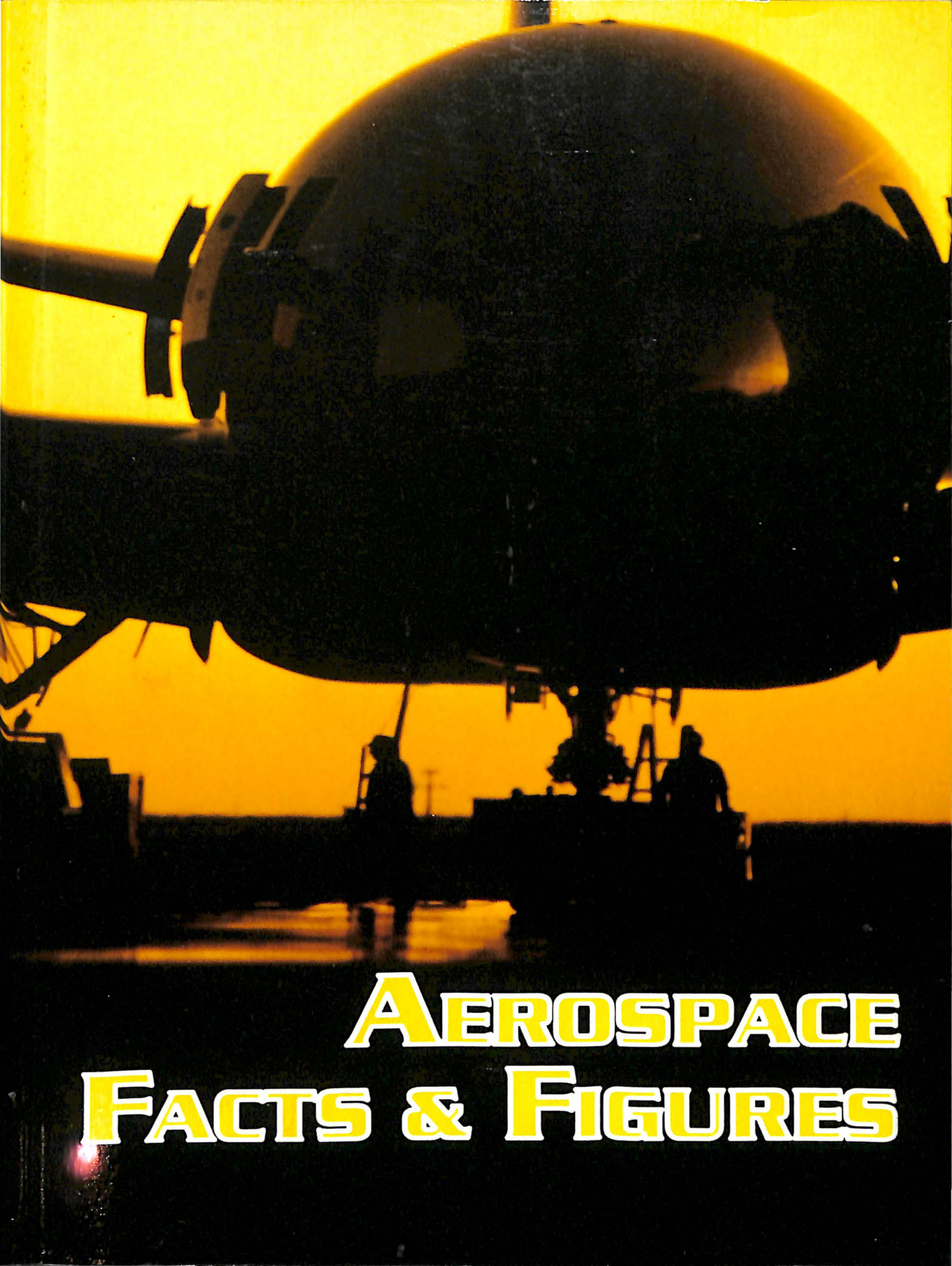

AEROSPACE FACTS & FIGURES

Aerospace Facts & Figures

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Contents

Foreword

THE U.S. AEROSPACE INDUSTRY'S recovery picked up more steam in 1997 with a strong jump in sales. This second straight year of growth signals a turnaround from the recession that hit the aerospace industry in 1992 and bottomed out in 1995. The engine that drove the recovery was the commercial market. And, as commercial sales soared, the government market held steady, registering only a slight drop in inflation-adjusted dollars.

Overall industry sales increased by 12% in 1997, reaching $134 billion. Behind that growth was a dramatic 29% boost in sales to non-U.S. government customers—mainly airlines. The industry also recorded its first significant increase in employment since 1989 with 62,000 workers being added to the industry's work force. In other good news, the industry's backlog grew and exports surged.

Of special note in the 1997 sales figures is the strong market for civil transport aircraft, which accounted for 85% of the value of civil aircraft shipments. The industry delivered 374 jetliners, 105 more than the previous year, for a total of $27 billion in sales. The backlog for civil transports also increased, rising to 1,744 planes from 1,617.

The industry's performance in international trade is also noteworthy. Aerospace exports jumped by 25%, reaching an all-time high of $50 billion. Exports outpaced the growth in imports resulting in a positive trade balance of $32 billion, a 21% gain.

There were also signs that the long slide in defense spending may have bottomed out. Although most analysts had been predicting flat or declining defense budgets in the years ahead, a greater awareness of military readiness problems and underfunded modernization accounts, alongside a federal budget surplus, led to a $9 billion add-on to the Defense Department's budget for Fiscal Year (FY) 1999. Of that, $1 billion was earmarked for Research, Development, Test, and Evaluation (RDT&E) funding of missile defense programs. Future increases are by no means assured, but the level of modernization funding will continue to be the subject of debate in the 106th Congress, and there is a strong case to be made for reversing the long decline in defense spending.

The space market enjoyed a third year of steady growth with $32 billion in sales of space systems and services. Expanding activity in the areas of communications services and space infrastructure pushed the level of sales beyond the peak year of 1992, when sales mounted to $30 billion. With government spend-

John W. Douglass
President and Chief Executive Officer, Aerospace Industries Association

ing leveling out, the commercial space gains should continue to drive growth in this market.

Despite the good news, there are some warning signs on the horizon. For example, industry earnings were flat in 1997, with profit margins down slightly from the gains made in 1996. There was also a steep drop in new orders for military aerospace systems, which pulled total new orders down to $120 billion, an overall 5% drop. Although civil orders actually rose by a healthy $8 billion, U.S. commercial aircraft makers have not yet experienced the fallout from the Asian economic crisis, which could lead to canceled orders. Already, a number of Asian countries have delayed or canceled military and commercial aircraft orders, and more may follow.

Nevertheless, the industry is in a good position to weather the downturn in the Asian market, which had been expected to provide new sales opportunities well into the next century. Today, the U.S. aerospace industry is smaller, leaner, and more efficient than it was when troubles in the U.S. airline industry depressed the commercial market in the early 1990s. The aerospace market is also more evenly distributed and better able to handle a downturn in one sector than in the past when military sales dominated. In fact, the space market is now nearly equal to the military aircraft market and is forecast to continue to grow into the next decade. Finally, the steady decline in military modernization funding during the 1990s may be finally bottoming out.

As the new President and CEO of AIA, I have enormous respect for the aerospace industry's technological capability, the quality of its products, and its overall competitiveness. The tremendous demand for services from space-based satellites, both in the military and commercial markets, the increased awareness of the need to adequately fund military modernization, and the continual demand for efficient airline travel are all positive signs for the U.S. aerospace industry.

Aerospace Summary

THE U.S. AEROSPACE INDUSTRY enjoyed a strong 12% increase in total sales in 1997 (in inflation-adjusted constant dollars), nearly doubling the gains made in 1996. This significant boost was fueled by higher sales, up an inflation-adjusted 29%, to the "other customers" category—"other customers" include air carriers, foreign governments, corporations, and private citizens. Sales of "related products and services" also rose 12%, while sales to U.S. government agencies held steady.

Here are the highlights of the industry's 1997 performance:

Sales. Overall industry sales totaled $134 billion, compared with $117 billion in 1996. The "other customers" category jumped to $56 billion in sales, up from $42 billion in 1996. Sales to the Department of Defense (DoD) fell slightly, when measured in inflation-adjusted dollars, to $43 billion in 1997, marking the tenth year of decline. Total U.S. government sales reached $56 billion, up from $55 billion the previous year, but down slightly after inflation adjustments are made.

As usual, aircraft sales led all other product groups. Sales of aircraft, engines, and parts (civil and military combined) totaled $71 billion, compared with $60 billion in 1996. Total aircraft sales break down into $39 billion for civil aircraft and $33 billion for military aircraft, with civil aircraft sales dominating military sales for the first time since 1993.

Sales of space systems and services (civil and military) grew for the third year in a row, reaching $32 billion, up from $29 billion in 1996. There was also a gain in sales of "related products and services," where sales reached $22 billion, up from $19 billion the previous year. Missile systems sales held steady at $8 billion for a second year.

For 1997, aerospace industry sales amounted to 1.6% of the Gross Domestic Product and 3.4% of total sales by all U.S. manufacturing industries, rising from 1.5% and 3.1%, respectively, in 1996.

Earnings. Net income after taxes was $7.2 billion, the same as the previous year. As a percentage of sales, the industry's profit amounted to 5.2%, a drop from the 1996 aerospace profit-to-sales ratio of 5.6%. By comparison, the average for all U.S. manufacturing industries was 6.2%. As a percentage of assets, aerospace profits amounted to 4.8%; as a percentage of equity, 17.3%.

The aerospace industry reported net working capital of $14.2 billion, down from $16 billion in 1996. Stockholders' equity also dropped from $39.8 billion in 1996 to $39.3 billion in 1997, while total assets

climbed substantially from $136 billion to $150 billion.

Orders and Backlog. Net new orders for aerospace systems totaled $120 billion, down from $126 billion in 1996, a 5% drop, marking the first decrease after three years of growth. A drop in military orders, from $62 billion in 1996 to $48 billion in 1997, led to the overall decline in new orders. Orders in the civil sector actually rose from $64 billion in 1996 to $72 billion in 1997.

The industry's backlog at year-end 1997 was $234 billion, up from $230 billion in the previous year. Of that, 63%, or $149 billion, was in orders for civil products. The backlog for military systems was $86 billion, down from $90 billion the previous year.

Civil Aircraft Production. Data compiled by the Aerospace Industries Association (AIA) shows that U.S. manufacturers shipped 2,289 civil aircraft in 1997 with a total value of $32 billion. That represents a gain of 612 units and $11 billion over 1996 levels.

Commercial transport production—374 aircraft valued at $27 billion—accounted for 85% of the total value; the figures compare with 269 aircraft worth $17.6 billion in 1996.

Production of civil helicopters jumped to its highest level since 1991, reaching 346 units (up 68) valued at $231 million (up $38 million).

General aviation aircraft sales increased to 1,569 (up 439 units) worth $4.7 billion (up $1.5 billion). This sales level marked another record year for general aviation.

Military Aircraft Production. The Census Bureau reported 1997 sales of military aircraft and parts, including engines, to be $24.6 billion in 1997. That figure compares with $24.8 billion in 1996.

The industry produced 510 military aircraft in 1997. Of that total, 337 were exported either through Foreign Military Sales arrangements or through direct company-to-foreign-customer sales and 173 were delivered to U.S. military agencies. The comparable figures for 1996 were: 558 total, 316 exports, and 242 for the U.S. military services.

For Fiscal Year (FY) 1998, the major aircraft types procured were the Air Force C-17 Globemaster III transport, the Navy F/A-18E/F fighter, the Air Force F-22 Raptor fighter, the Navy/Marine Corps V-22 Osprey tiltrotor aircraft, the Army AH-64 Apache helicopter, the Air Force E-8C JSTARS surveillance aircraft, the Navy E-2C Hawkeye early warning and control aircraft, and the Army UH-60 Black Hawk helicopter.

Foreign Trade. Aerospace exports grew for a second year, reaching an all-time high of $50 billion, up a remarkable 25% over the previous year's $40 billion.

The aerospace trade balance also increased, as exports grew by more than double that of imports. Total

imports came to $18 billion, compared with $13.7 billion in 1996. This resulted in a record trade balance of $32 billion, up $5.6 billion, or 21%.

As usual, civil exports accounted for the majority of total aerospace exports—nearly 80%. Civil aerospace exports, at $40 billion, compares with $29 billion in the previous year, a notable gain of 36%. Exports of civil transport aircraft, at $21 billion, accounted for 52% of the civil export total. Jetliner sales were $7.4 billion higher than in the previous year.

Space Programs. Space sector sales came to $32 billion, up from $29 billion in 1996. AIA figures include civil and military space systems and parts plus U.S. government space activities, including contracts for Research, Development, Test, and Evaluation (RDT&E).

The Census Bureau reported the fourth straight year of increased sales of space systems, with a total for 1997 of $13.4 billion, up from $11.7 billion in the previous year. The 1997 sales figure included $8.5 billion in civil workload (commercial plus government-sponsored civil space) and $4.9 billion in military work. The Bureau's figures exclude launch vehicle propulsion systems, spacecraft orbital adjustment engines/motors, and RDT&E.

Missile Programs. According to revised AIA statistics, missile sector sales held steady in 1997—buoyed by significant investment in missile defense RDT&E. Missile sector sales amounted to $8 billion in 1997, the same as in the previous year. However, Census Bureau data (which exclude RDT&E and the value of separable propulsion units) showed a drop in the sales of missile systems and parts to $4 billion, down from a revised 1996 figure of $4.8 billion.

A significant chunk of funding ($3.2 billion) will go to RDT&E programs related to ballistic missile defense rather than procurement of production-type systems. DoD outlays for missile procurement continued the steady decline that began in FY 1991, after a peak of nearly $15 billion in FY 1990. Missile outlays for FY 1998 totaled $4.5 billion, down from a FY 1997 figure of $5.2 billion. Another decrease in outlays was planned for FY 1999 ($4.3 billion). Major production programs of 1997/1998 included the USAF/Navy AMRAAM air-to-air missile, the Navy Trident II Fleet Ballistic Missile, the Army Hellfire antiarmor missile, and the Ballistic Missile Defense Organization's Patriot PAC-3 air defense system.

Research and Development. In 1997, total funding for research and development (R&D) in the U.S. amounted to $206 billion, up from $196 billion in the previous year, according to the National Science Foundation (NSF). Almost two-thirds of the total (64%) was funded by industry ($131 billion), which also

performed the great bulk (more than 74%) of the R&D work. For 1998, NSF estimates total R&D funding at $221 billion, indicating that industry will again be the principal funding source (65%) and performer (75%).

In 1996 (the latest year for which NSF data are available by industry), aerospace R&D funding (federal and company) totaled $16.2 billion, a decrease of 4.3% from the previous year's level. Aerospace R&D amounted to 12.9% of net sales, the same as the previous year. Company funding as a percentage of net sales was 4.5%; the average for all U.S. manufacturing industries was 3.3%.

Employment. Employment in the aerospace industry saw its first significant increase since 1989. After five years of contraction, beginning in 1990, aerospace employment bottomed out in the 1995-1996 period before dramatically rebounding in 1997. On an annual average employment basis, the industry's labor force jumped by 62,000 workers, reaching a total of 858,000. The 1997 employment figure represented 4.6% of the total employment in all U.S. manufacturing industries. The aerospace workforce also represented 7.8% of total employment by U.S. companies engaged in production of durable goods.

STANDARD INDUSTRIAL CLASSIFICATIONS APPLICABLE TO THE AEROSPACE INDUSTRY

3721 **AIRCRAFT**
- 37211 Military aircraft
- 37215 Civilian aircraft
- 37217 Modification, conversion, and overhaul of previously accepted aircraft
- 37218 Aeronautical services on complete aircraft, nec

3724 **AIRCRAFT ENGINES AND ENGINE PARTS**
- 37241 Aircraft engines for military aircraft
- 37242 Aircraft engines for civilian aircraft
- 37243 Aeronautical services on aircraft engines
- 37244 Aircraft engine parts and accessories

3728 **AIRCRAFT PARTS AND AUXILIARY EQUIPMENT, NEC**
- 37281 Aircraft parts and auxiliary equipment, nec
- 37282 Aircraft propellers and helicopter rotors
- 37283 Research and development on aircraft parts

3761 **GUIDED MISSILES AND SPACE VEHICLES**
- 37611 Complete guided missiles (excluding propulsion systems)
- 37612 Complete space vehicles (excluding propulsion systems)
- 37613 Research and development on complete guided missiles
- 37614 Research and development on complete space vehicles
- 37615 All other services on complete guided missiles and space vehicles

3663 **RADIO AND TELEVISION COMMUNICATIONS EQUIPMENT**
- 36631 Communication systems and equipment, except broadcast

3764 **SPACE PROPULSION UNITS AND PARTS**
- 37645 Complete missile or space vehicle engines and/or propulsion units
- 37646 Research and development on complete missile or space vehicle engines and/or propulsion units
- 37647 Services on complete guided missile or space vehicle engines and/or propulsion units, nec
- 37648 Missile and space vehicle engine and/or propulsion unit parts and accessories

3769 **SPACE VEHICLE EQUIPMENT, NEC**
- 37692 Missile and space vehicle components, parts and subassemblies, nec
- 37694 Research and development on missile and space vehicle parts and components, nec

3669 **COMMUNICATIONS EQUIPMENT, NEC**
- 36691 Alarm systems
- 36692 Traffic control equipment
- 36693 Intercommunication equipment

3812 **SEARCH, DETECTION, NAVIGATION, GUIDANCE, AERONAUTICAL AND NAUTICAL SYSTEMS, INSTRUMENTS, AND EQUIPMENT**
- 38121 Aeronautical, nautical, and navigational instruments, not sending or receiving radio signals
- 38122 Search, detection, navigation, and guidance systems and equipment

3829 **MEASURING AND CONTROLLING DEVICES, NEC**
- 38291 Aircraft engine instruments, except flight

Source: Office of Management and Budget, "Standard Industrial Classification Manual, 1987."
NOTE: The Standard Industrial Classification (SIC) is a system developed by the U.S. Government to def[illegible] the industrial composition of the economy, facilitating comparability of statistics. It is revised periodically to reflect the ch[illegible]ging industrial composition of the economy.
NEC: Not elsewhere classified.

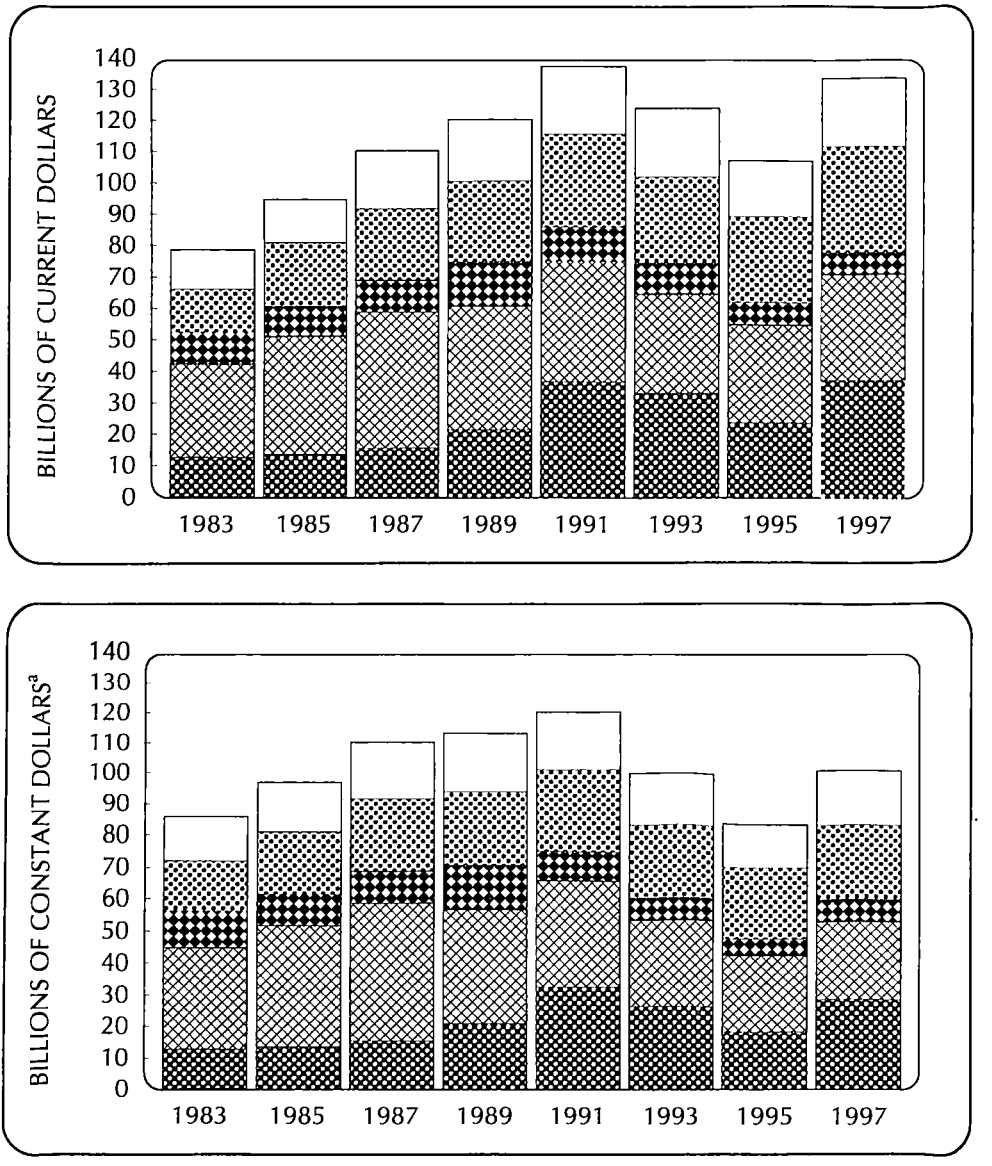
AEROSPACE INDUSTRY SALES BY CUSTOMER

Calendar Years 1983–1997
(Millions of Dollars)

Year	TOTAL SALES	Aerospace Products and Services				Related Products and Services
		Total	U.S. Government		Other Customers	
			Dept. of Defense	NASA and Other Agencies		
CURRENT DOLLARS						
1983	$ 79,975	$ 66,646	$41,558	$ 5,910	$19,178	$13,329
1984	83,486	69,572	45,969	6,063	17,540	13,914
1985	96,571	80,476	53,178	6,262	21,036	16,095
1986	106,183	88,486	59,161	6,236	23,089	17,697
1987	110,008	91,673	61,817	6,813	23,043	18,335
1988	114,562	95,468	61,327	7,899	26,242	19,094
1989	120,534	100,445	61,199	9,601	29,645	20,089
1990	134,375	111,979	60,502	11,097	40,379	22,396
1991	139,248	116,040	55,922	11,739	48,379	23,208
1992	138,591	115,493	52,202	12,408	50,882	23,099
1993	123,183	102,653	47,017	12,255	43,380	20,531
1994	110,558	92,132	43,795	11,932	36,405	18,426
1995[r]	107,782	89,818	42,401	11,413	36,004	17,964
1996[r]	116,838	97,365	42,556	12,391	42,418	19,473
1997	133,675	111,396	42,994	12,744	55,659	22,279
CONSTANT DOLLARS [a]						
1983	$ 86,741	$ 72,284	$45,074	$ 6,410	$20,800	$14,457
1984	83,653	69,711	46,061	6,075	17,575	13,942
1985	97,843	81,536	53,878	6,344	21,313	16,307
1986	106,396	88,663	59,280	6,248	23,135	17,732
1987	110,008	91,673	61,817	6,813	23,043	18,335
1988	112,426	93,688	60,184	7,752	25,753	18,738
1989	113,604	94,670	57,680	9,049	27,941	18,934
1990	121,606	101,338	54,753	10,043	36,542	20,268
1991	121,508	101,257	48,798	10,243	42,216	20,251
1992	117,251	97,710	44,164	10,497	43,047	19,542
1993	101,636	84,697	38,793	10,111	35,792	16,940
1994[r]	89,304	74,420	35,376	9,638	29,406	14,884
1995[r]	85,745	71,454	33,732	9,080	28,643	14,291
1996[r]	91,710	76,425	33,403	9,726	33,295	15,285
1997	102,827	85,689	33,072	9,803	42,815	17,138

Source: Aerospace Industries Association.
NOTE: See Glossary for explanation of "Aerospace Industry," "Aerospace Sales," "Other Customers," and "Related Products and Services."
a Based on AIA's aerospace composite price deflator, 1987=100.
r Revised.

Aerospace Sales by Product Group



SOURCE: AEROSPACE INDUSTRIES ASSOCIATION

[a] BASED ON AIA'S AEROSPACE COMPOSITE PRICE DEFLATOR (1987=100)

AEROSPACE INDUSTRY SALES BY PRODUCT GROUP

Calendar Years 1983–1997
(Millions of Dollars)

Year	TOTAL SALES	Aircraft			Missiles	Space	Related Products & Services
		Total	Civil	Military			
CURRENT DOLLARS							
1983	$ 79,975	$42,431	$12,373	$30,058	$10,269	$13,946	$13,329
1984	83,486	41,905	10,690	31,215	11,335	16,332	13,914
1985	96,571	50,482	13,730	36,752	11,438	18,556	16,095
1986	106,183	56,405	15,718	40,687	11,964	20,117	17,697
1987	110,008	59,188	15,465	43,723	10,219	22,266	18,335
1988	114,562	60,886	19,019	41,867	10,270	24,312	19,094
1989	120,534	61,550	21,903	39,646	13,622	25,274	20,089
1990	134,375	71,353	31,262	40,091	14,180	26,446	22,396
1991	139,248	75,918	37,443	38,475	10,970	29,152	23,208
1992	138,591	73,905	39,897	34,008	11,757	29,831	23,099
1993	123,183	65,829	33,116	32,713	8,451	28,372	20,531
1994	110,558	57,648	25,596	32,052	7,563	26,921	18,426
1995	107,782[r]	55,048	23,965	31,082	7,386[r]	27,385	17,964[r]
1996[r]	116,838	60,310	26,869	33,441	8,015	29,040	19,473
1997	133,675	71,336	38,548	32,788	7,985	32,075	22,279
CONSTANT DOLLARS[a]							
1983	$ 86,741	$46,021	$13,420	$32,601	$11,138	$15,126	$14,457
1984	83,653	41,989	10,711	31,278	11,358	16,365	13,942
1985	97,843	51,147	13,911	37,236	11,589	18,800	16,307
1986	106,396	56,518	15,749	40,769	11,988	20,157	17,732
1987	110,008	59,188	15,465	43,723	10,219	22,266	18,335
1988	112,426	59,751	18,664	41,086	10,079	23,859	18,738
1989	113,604	58,011	20,644	37,367	12,839	23,821	18,934
1990	121,606	64,573	28,291	36,281	12,833	23,933	20,268
1991	121,508	66,246	32,673	33,573	9,572	25,438	20,251
1992	117,251	62,525	33,754	28,772	9,947	25,238	19,542
1993	101,636	54,314	27,323	26,991	6,973	23,409	16,940
1994[r]	89,304	46,565	20,675	25,890	6,109	21,746	14,884
1995[r]	85,745	43,793	19,065	24,727	5,876	21,786	14,291
1996[r]	91,710	47,339	21,090	26,249	6,291	22,794	15,285
1997	102,827	54,874	29,652	25,222	6,142	24,673	17,138

Source: Aerospace Industries Association.
NOTE: See Glossary for explanation of "Aerospace Industry," "Aerospace Sales," "Other Customers," and "Related Products and Services."
a Based on AIA's aerospace composite deflator, 1987=100.
r Revised.

SALES OF MAJOR AEROSPACE COMPANIES AS REPORTED BY THE BUREAU OF THE CENSUS

Calendar Years 1983–1997
(Millions of Dollars)

Year	GRAND TOTAL	TOTAL		Aircraft, Engines, & Parts		Missiles, Space, & Rocket Propulsion	Other Aerospace		Non-Aerospace
		Military	Non-Mil.	Military	Non-Mil.		Military	Non-Mil.	
CURRENT DOLLARS									
1983	$ 83,453	$50,525	$32,928	$19,809	$16,070	$12,745	$12,310	$3,179	$19,340
1984	88,941	57,047	31,894	23,268	14,017	13,624	12,245	3,257	22,530
1985	100,522	65,098	35,424	25,758	18,182	16,741	14,491	3,675	21,675
1986	105,577	68,303	37,274	27,043	20,714	17,535	16,287	3,520	20,478
1987	110,301	70,194	40,107	27,806	21,256	20,715	15,786	3,429	21,309
1988	113,548	69,448	44,100	25,068	25,674	21,514	16,382	2,946	21,964
1989	122,148	71,647	50,501	24,287	29,538[r]	22,643	16,908	3,605	25,167
1990	136,646	73,616	63,030	27,667	38,622	22,040	15,773	4,342	28,202
1991	123,862	67,089	56,773	25,385	43,155	23,311	13,472	4,281	14,258
1992	118,736	61,410	57,326	23,509	44,160	21,349	12,153	3,377	14,188
1993	109,926	56,102	53,824	20,099	40,987	18,134	11,936	3,592	15,178
1994	104,296	58,012	46,284	23,652	30,901	18,406	11,981	4,417	14,939
1995	102,797	52,476	50,321	22,944	32,085	18,366	11,921	4,462	13,019
1996[r]	103,115	53,153	49,962	24,804	32,722	18,506	12,171	4,624	10,287
1997	114,167	51,408	62,759	24,580	42,313	20,099	12,462	3,914	10,799
CONSTANT DOLLARS [a]									
1983	$ 90,513	$54,799	$35,714	$21,485	$17,430	$13,823	$13,351	$3,448	$20,976
1984	89,119	57,161	31,958	23,315	14,405	13,651	12,270	3,264	22,575
1985	101,846	65,955	35,891	26,097	18,421	16,961	14,682	3,723	21,960
1986	105,789	68,440	37,349	27,097	20,756	17,570	16,320	3,527	20,519
1987	110,301	70,194	40,107	27,806	21,256	20,715	15,786	3,429	21,309
1988	111,431	68,153	43,278	24,601	25,195	21,113	16,077	2,891	21,554
1989	115,125	67,528	47,598	22,891	27,841[r]	21,341	15,936	3,398	23,720
1990	123,662	66,621	57,041	25,038	34,952	19,946	14,274	3,929	25,522
1991	108,082	58,542	49,540	22,151	37,657	20,341	11,756	3,736	12,442
1992	100,453	51,954	48,499	19,889	37,360	18,062	10,282	2,857	12,003
1993	90,698	46,289	44,409	16,583	33,818	14,962	9,848	2,964	12,523
1994[r]	84,246	46,859	37,386	19,105	24,960	14,868	9,678	3,568	12,067
1995[r]	81,780	41,747	40,033	18,253	25,525	14,611	9,484	3,550	10,357
1996[r]	80,938	41,721	39,217	19,469	25,684	14,526	9,553	3,630	8,075
1997	87,821	39,545	48,276	18,908	32,548	15,461	9,586	3,011	8,307

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)" Series MA37D (Annually).
a Based on AIA's aerospace composite price deflator, 1987=100.
r Revised.

ORDERS AND BACKLOG OF MAJOR AEROSPACE COMPANIES AS REPORTED BY THE BUREAU OF THE CENSUS

Calendar Years 1983–1997
(Millions of Dollars)

Year	GRAND TOTAL	TOTAL		Aircraft, Engines, & Parts		Missiles, Space, & Rocket Propulsion	Other Aerospace		Non-Aerospace
		Military	Non-Mil.	Military	Non-Mil.		Military	Non-Mil.	
NET NEW ORDERS									
1983	$ 91,647	$ 62,053	$ 29,594	$26,231	$ 12,368	$14,248	$14,342	$3,508	$20,950
1984	104,863	69,654	35,209	29,894	17,208	16,485	13,673	3,838	23,765
1985	110,968	70,978	39,990	28,201	21,471	20,328	14,488	3,042	23,168
1986	110,836	70,132	40,704	24,124	23,833	20,445	16,836	3,510	22,088
1987	121,224	67,594	53,630	19,347	33,000	26,272	14,178	4,379	24,048
1988	147,128	69,209	77,919	24,242	57,906	20,240	18,423	3,044	23,273
1989	173,635	79,992	93,643	28,818	67,773	26,820	17,814	3,945	28,465
1990	145,965	56,405	89,560	17,735	64,651	20,207	12,945	3,556	26,871
1991	122,485	63,017	59,468	26,675	40,815	24,955	11,329	4,360	14,351
1992	100,306	57,383	42,923	19,631	30,110	22,849	11,201	3,256	13,259
1993	79,770	49,541	30,229	19,518	16,090	14,919	11,121	4,629	13,493
1994	88,706	53,268	35,438	23,352	20,166	13,705	12,924	5,395	13,164
1995	109,109	49,350	59,759	19,854	36,467	19,181	13,716	5,261	14,630
1996 r	126,267	62,127	64,140	25,343	45,281	27,067	12,136	5,070	11,370
1997	119,851	47,803	72,048	21,155	51,526	20,418	12,679	4,090	9,983
BACKLOG AS OF DECEMBER 31									
1983	$116,585	$ 83,757	$ 32,828	$38,824	$ 21,548	$14,962	$18,483	$3,690	$19,078
1984	132,507	96,364	36,143	45,450	24,739	17,823	19,911	4,271	20,313
1985	142,953	102,244	40,709	47,893	28,298	21,410	19,908	3,638	21,806
1986	148,212	104,073	44,139	44,974	31,417	24,320	20,457	3,628	23,416
1987	158,650	99,474	59,176	36,514	43,501	30,544	18,937	4,604	24,550
1988	191,518	99,117	92,401	35,515	75,765	29,078	20,584	4,734	25,842
1989	252,401	114,070	138,331	44,026	115,124	33,771	24,186	7,652	27,642
1990	250,079	88,471	161,608	33,788	139,152	31,648	18,501	4,999	21,991
1991	245,241	89,517	155,724	39,149	134,527	32,657	17,213	4,907	16,788
1992	236,076	92,139	143,937	44,255	124,322	32,933	14,886	4,859	14,821
1993	211,814	91,751	120,063	46,177	96,228	29,511	16,668	7,958	15,272
1994	192,561	84,445	108,116	44,624	85,305	24,746	15,599	8,043	14,244
1995	202,638	82,309	120,329	44,642	92,239	27,113	17,534	8,214	12,906
1996 r	229,871	89,500	140,371	47,635	106,341	35,440	16,176	9,339	14,940
1997	234,488	85,599	148,889	43,927	114,710	35,805	16,412	9,405	14,229

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)" Series MA37D (Annually).
r Revised.

AEROSPACE SALES AND THE NATIONAL ECONOMY

Calendar Years 1983–1997
(Billions of Dollars)

Year	Gross Domestic Product	Industry Sales			Aerospace Sales As Percent of		
		Manufacturing	Durable Goods	Aerospace	GDP	Manufacturing	Durable Goods
CURRENT DOLLARS							
1983	$3,514.5	$2,070.6	$1,025.8	$ 80.0	2.3%	3.9%	7.8%
1984	3,902.4	2,288.2	1,175.3	83.5	2.1	3.6	7.1
1985	4,180.7	2,334.5	1,215.3	96.6	2.3	4.1	7.9
1986	4,422.2	2,335.9	1,238.9	106.2	2.4	4.5	8.6
1987	4,692.3	2,475.9	1,297.5	110.0	2.3	4.4	8.5
1988	5,049.6	2,695.4	1,421.5	114.6	2.3	4.3	8.1
1989	5,438.7	2,840.4	1,477.9	120.5	2.2	4.2	8.2
1990	5,743.8	2,912.2	1,485.3	134.4	2.3	4.6	9.0
1991	5,916.7	2,878.2	1,452.0	139.2	2.4	4.8	9.6
1992	6,244.4	3,004.7	1,541.9	138.6	2.2	4.6	9.0
1993	6,558.1	3,127.6	1,630.6	123.2	1.9	3.9	7.6
1994	6,947.0	3,348.0	1,789.6	110.6	1.6	3.3	6.2
1995[r]	7,269.6	3,594.7	1,927.0	107.8	1.5	3.0	5.6
1996[r]	7,661.6	3,715.5	2,004.2	116.8	1.5	3.1	5.8
1997	8,110.9	3,929.4	2,158.7	133.7	1.6	3.4	6.2
CONSTANT DOLLARS[ar]					**Real Annual Growth[b]**		
					GDP[r]	Mfg.[r]	Durs.[r]	Aero.
1983	$4,803.9	$2,830.2	$1,402.1	$ 86.7	4.0%	1.3%	3.5%	12.5%
1984	5,140.1	3,013.9	1,548.1	83.7	7.0	6.5	10.4	(3.6)
1985	5,323.7	2,972.7	1,547.6	97.8	3.6	(1.4)	(0.0)	17.0
1986	5,488.0	2,898.8	1,537.4	106.4	3.1	(2.5)	(0.7)	8.7
1987	5,649.3	2,980.9	1,562.2	110.0	2.9	2.8	1.6	3.4
1988	5,864.8	3,130.6	1,651.0	112.4	3.8	5.0	5.7	2.2
1989	6,061.9	3,165.8	1,647.2	113.6	3.4	1.1	(0.2)	1.0
1990	6,133.9	3,110.0	1,586.2	121.6	1.2	(1.8)	(3.7)	7.0
1991	6,079.6	2,957.4	1,492.0	121.5	(0.9)	(4.9)	(5.9)	(0.1)
1992	6,244.4	3,004.7	1,541.9	117.3	2.7	1.6	3.3	(3.5)
1993	6,389.4	3,047.2	1,588.7	101.6	2.3	1.4	3.0	(13.3)
1994	6,610.5	3,185.9	1,702.9	89.3	3.5	4.6	7.2	(12.1)[r]
1995	6,746.1	3,335.8	1,788.3	85.7	2.1	4.7	5.0	(4.0)[r]
1996	6,951.2	3,371.0	1,818.3	91.7	3.0	1.1	1.7	7.0[r]
1997	7,209.7	3,492.8	1,918.8	102.8	3.7	3.6	5.5	12.1

Source: Council of Economic Advisors, "Economic Indicators" (Monthly); Bureau of Census; and Aer ,pace Industries Association.
a Aerospace industry constant dollar sales based on AIA's aerospace composite price deflator, 1987=100. Others based on GDP deflator, 1992=100.
b Parentheses indicate negative real annual growth.
r Revised.

GROSS DOMESTIC PRODUCT, FEDERAL BUDGET, AND DEFENSE BUDGET

Fiscal Years 1966–1999
(Billions of Dollars)

Year	Fiscal Year GDP	Federal Budget Outlays		Defense Outlays[c] as percent of	
		Net Total[a]	National Defense[b]	GDP	Federal Budget
1966	$ 752.7	$ 134.5	$ 58.1	7.7%	43.2%
1967	811.9	157.5	71.4	8.8	45.4
1968	868.0	178.1	81.9	9.4	46.0
1969	948.1	183.6	82.5	8.7	44.9
1970	1,009.4	195.6	81.7	8.1	41.8
1971	1,077.4	210.2	78.9	7.3	37.5
1972	1,177.0	230.7	79.2	6.7	34.3
1973	1,306.8	245.7	76.7	5.9	31.2
1974	1,438.1	269.4	79.3	5.5	29.5
1975	1,554.5	332.3	86.5	5.6	26.0
1976	1,730.4	371.8	89.6	5.2	24.1
Tr.Qtr.	454.8	96.0	22.3	4.9	23.2
1977	1,971.4	409.2	97.2	4.9	23.8
1978	2,212.6	458.7	104.5	4.7	22.8
1979	2,495.9	504.0	116.3	4.7	23.1
1980	2,718.9	590.9	134.0	4.9	22.7
1981	3,049.1	678.2	157.5	5.2	23.2
1982	3,211.3	745.8	185.3	5.8	24.8
1983	3,421.9	808.4	209.9	6.1	26.0
1984	3,812.0	851.9	227.4	6.0	26.7
1985	4,102.1	946.4[r]	252.7[b]	6.2	26.7
1986	4,374.3	990.5	273.4	6.2	27.6
1987	4,605.1	1,004.1[r]	282.0	6.1	28.1
1988	4,953.5	1,064.5	290.4	5.9	27.3
1989	5,351.8	1,143.7	303.6	5.7	26.5
1990	5,684.5	1,253.2	299.3	5.3	23.9
1991	5,858.8	1,324.4	273.3[c]	4.7	20.6
1992	6,143.2	1,381.7	298.4[c]	4.9	21.6
1993	6,475.1[r]	1,409.4	291.1[c]	4.5	20.7
1994	6,845.7[r]	1,461.7	281.6	4.1	19.3
1995	7,194.8[r]	1,515.7	272.1	3.8	17.9
1996	7,529.8[r]	1,560.5[r]	265.7	3.5[r]	17.0
1997	7,972.4	1,601.2	270.5	3.4	16.9
1998[E]	8,348.0	1,667.8	264.1	3.2	15.8
1999[E]	8,684.6	1,733.2	265.5	3.1	15.3

Source: Office of Management and Budget, "The Budget of the United States Government" (Annually).
a "Net Total" is government-wide total less intragovernmental transactions.
b "National Defense" includes the military budget of DoD and other defense-related activities. Beginning in 1985, the Federal Budget reflects establishment of a military retirement trust fund. Data for prior years adjusted for comparable treatment of military retired pay.
c 1991–1993 reflects transfers from the Defense Cooperation Account funded by foreign government and private cash contributions reducing total U.S.-funded military outlays.
E Estimate.
r Revised.
Tr.Qtr. See Glossary.

FEDERAL OUTLAYS
DEFENSE, NASA, AND AEROSPACE PRODUCTS & SERVICES

Fiscal Years 1972–1999
(Millions of Dollars)

Year	TOTAL National Defense	TOTAL NASA	Federal Outlays for Aerospace Products & Services			Aerospace as Percent of Total National Defense and NASA
			TOTAL	DoD[a]	NASA	
1972	$ 79,174	$ 3,423	$12,309	$ 8,936	$ 3,373	14.9%
1973	76,681	3,315	11,360	8,089	3,271	14.2
1974	79,347	3,256	11,168	7,987	3,181	13.5
1975	86,509	3,267	11,544	8,373	3,181	12.9
1976	89,619	3,669	12,364	8,816	3,548	13.3
Tr.Qtr.	22,269	951	2,855	1,959	926	12.3
1977	97,241	3,945	13,229	9,389	3,840	13.1
1978	104,495	3,983	13,926	10,067	3,859	12.8
1979	116,342	4,197	16,686	12,622	4,064	13.8
1980	133,995	4,852	20,269	15,558	4,711	14.6
1981	157,513	5,421	24,276	19,002	5,274	14.9
1982	185,309	6,035	29,501	23,575	5,926	15.4
1983	209,903	6,664	35,364	28,808	6,556	16.3
1984	227,413	7,048	39,663	32,723	6,940	16.9
1985	252,748	7,318	44,483	37,335	7,148	17.1
1986	273,375	7,404	49,773	42,558	7,215	17.7
1987	281,999	7,591	51,871	44,429	7,442	17.9
1988	290,361	9,092	48,848	39,922	8,926	16.3
1989	303,559	11,036	52,933	42,072	10,861	16.8
1990	299,331	12,429	53,194	40,992	12,202	17.1
1991[b]	273,292	13,878	53,630	40,089	13,541	18.7
1992[b]	298,350	13,961	50,569	37,085	13,484	16.2
1993[b]	291,086	14,305	45,496	31,763	13,733	14.9
1994	281,642	13,695	41,082	27,774	13,308	13.9
1995	272,066	13,378	36,696	23,638	13,058	12.9
1996	265,748	13,881	32,947	20,530	12,417	11.8
1997	270,473	14,360	32,808	19,888	12,920	11.5
1998[E]	264,112	13,729	30,229	18,090	12,139	10.9
1999[E]	265,489	13,503	30,658	18,662	11,996	11.0

Source: Office of Management and Budget, "The Budget of the United States Government" (Annually); Department of Defense, "Status of Funds" (Annual Summaries); and NASA, "Pocket Statistics" (Annually).

NOTE: "National Defense" includes the military budget of the Department of Defense and other defense-related activities. "TOTAL NASA" includes all categories of the NASA budget; NASA construction is not included in "Aerospace Products and Services." See additional explanation with following table.

a Outlays for aircraft and missile procurement. Does not include RDT&E, which DoD has not reported by product group since 1977, and which, for comparability, has been subtracted from data previously reported in this table for earlier years. Also included are revisions to missile procurement data.

b 1991–1993 reflects transfers from the Defense Cooperation Account funded by foreign government and private cash contributions reducing total U.S.-funded military outlays.

E Estimate. Latest year reflects Administration's budget proposal.

Tr.Qtr. See Glossary.

FEDERAL OUTLAYS FOR AEROSPACE PRODUCTS AND SERVICES

Fiscal Years 1967–1999
(Millions of Dollars)

Year	TOTAL	Department of Defense[a]			NASA[b]
		TOTAL	Aircraft	Missiles	
1967	$15,478	$10,341	$ 8,411	$ 1,930	$ 5,137
1968	16,279	11,681	9,462	2,219	4,598
1969	15,872	11,686	9,177	2,509	4,186
1970	14,559	10,860	7,948	2,912	3,699
1971	12,918	9,580	6,549	3,031	3,338
1972	12,309	8,936	5,927	3,009	3,373
1973	11,360	8,089	5,066	3,023	3,271
1974	11,168	7,987	5,006	2,981	3,181
1975	11,554	8,373	5,484	2,889	3,181
1976	12,364	8,816	6,520	2,296	3,548
Tr.Qtr.	2,885	1,959	1,557	402	926
1977	13,229	9,389	6,608	2,781	3,840
1978	13,926	10,067	6,971	3,096	3,859
1979	16,686	12,622	8,836	3,786	4,064
1980	20,269	15,558	11,124	4,434	4,711
1981	24,276	19,002	13,193	5,809	5,274
1982	29,501	23,575	16,793	6,782	5,926
1983	35,364	28,808	21,013	7,795	6,556
1984	39,663	32,723	23,196	9,527	6,940
1985	44,483	37,335	26,586	10,749	7,148
1986	49,773	42,558	30,828	11,730	7,215
1987	51,871	44,429	32,956	11,473[c]	7,442
1988	48,848	39,922	28,246	11,676	8,926
1989	52,933	42,072	27,569	14,503	10,861
1990	53,194	40,992	26,142	14,851	12,202
1991	53,630	40,089	25,689	14,400	13,541
1992	50,569	37,085	23,581	13,504	13,484
1993	45,496	31,763	20,359	11,404	13,733
1994	41,082	27,774	18,840	8,934	13,308
1995	36,696	23,638	16,125	7,513	13,058
1996	32,947	20,530	14,331	6,199	12,417
1997	32,808	19,888	14,663	5,225	12,920
1998[E]	30,229	18,090	13,553	4,537	12,139
1999[E]	30,658	18,662	14,350	4,312	11,996

Source: Department of Defense, "Status of Funds" (Annual Summaries); Office of Management and Budget, "The Budget of the United States Government" (Annually); and NASA, "Pocket Statistics" (Annually).

a Outlays for aircraft and missile procurement. Does not include RDT&E, which DoD has not reported by product group since 1977, and which for comparability, has been subtracted from data previously reported in this table for earlier years.

b Includes Research & Development and Research & Program Management, and effective with 1984 data, Space Flight, Control, and Data Communications; excludes Construction of Facilities.

c Beginning in 1978, DoD combined Navy Missile Procurement with torpedoes and other related products into Navy Weapons Procurement, of which missiles comprise approximately 80 percent.

E Estimate. Latest year reflects Administration's budget proposal.

Tr.Qtr. See Glossary.

DEPARTMENT OF DEFENSE
TOTAL MILITARY OUTLAYS BY FUNCTIONAL TITLE[a]
Fiscal Years 1990–1999
(Millions of Dollars)

	1990	1991	1992	1993
TOTAL	$289,755	$262,389[d]	$286,892[d]	$278,561[d]
Procurement—TOTAL	$ 80,972	$ 82,028	$ 74,881	$ 69,936
Aircraft	26,142	25,689	23,581	20,359
Missiles[b]	14,851	14,400	13,504	11,404
Ships	11,016	11,512	11,035	10,136
Weapons[b]	3,873	3,716	3,324	3,061
Ammunition	2,003	2,103	1,996	1,383
Other[c]	23,088	24,609	21,442	23,593
Military Personnel—TOTAL	75,622	83,439	81,171	75,904
Active Forces	66,541	74,571	71,433	66,494
Reserve Forces	9,081	8,868	9,738	9,410
RDT&E	37,458	34,589	34,632	36,968
Operations & Maintenance	88,340	101,769	91,989	94,094
Military Construction	5,080	3,497	4,262	4,831
Family Housing	3,501	3,296	3,271	3,255
Other[d]	(1,218)	(46,229)[d]	(3,313)[d]	(6,428)[d]

Source: Department of Defense, "Status of Funds" (Annual Summaries) and Office of Management and Budget, "The Budget of the United States Government" (Annually).

NOTE: Data in parentheses are credit items. Detail may not add to totals because of rounding.

a Includes all items in the DoD military budget; excludes the DoD civil budget for the Army Corps of Engineers and other non-defense related activites.

b Beginning in 1978, DoD combined Navy Missiles Procurement with torpedoes and other related products into Navy Weapons Procurement. Missiles comprise approximately 80 percent of the value of this category.

c Includes Communications and Electronics.

d 1991–1993 reflects transfers from the Defense Cooperation Account funded by foreign government and private contributions reducing total U.S.-funded military outlays.

E Estimate. Latest year reflects Administration's budget proposal.

r Revised.

DEPARTMENT OF DEFENSE
TOTAL MILITARY OUTLAYS BY FUNCTIONAL TITLE[a] (Continued)

Fiscal Years 1990–1999
(Millions of Dollars)

1994	1995	1996	1997	1998 [E]	1999 [E]
$268,622	$259,442	$253,187	$258,311	$251,385	$252,650
$ 61,769	$ 54,982	$ 48,913	$ 47,690	$ 43,733	$ 45,467
18,840	16,125	14,331	14,663	13,553	14,350
8,934	7,513	6,199	5,225	4,537	4,312
9,132	8,780	7,346	7,085	6,585	6,959
1,795	1,783	1,788	1,918	1,776	1,692
997	1,339	1,232	1,615	1,686	1,851
22,071	19,441	18,017	17,184	15,596	16,303
73,137	70,809	66,669	69,724	69,649	70,497
63,686	61,606	57,843	60,371	60,502	61,065
9,449	9,203	8,826	9,353	9,147	9,432
34,762	34,594	36,494	37,015	35,770	35,913
87,929	91,078	88,759	92,461	92,393	93,438
4,979	6,823	6,683	6,187	5,545	5,128
3,316	3,571	3,828	4,003	3,960	3,807
2,729	(2,415)	1,841	1,231	335	(1,600)

FEDERAL PRICE DEFLATORS FOR GDP, DEFENSE, PPI, AND CPI

(1968–1999)

Year	GDP[r]		Federal Government Defense Purchases[r]		PPI, Capital Equipment	CPI, (Urban) All items
	FY GDP (FY 1992 =100)	CY GDP (CY 1992 =100)	Goods & Services (CY 1992 =100)	Equipment Investment (CY 1992 =100)	(CY 1982 =100)	(CY 82–84 =100)
1968	27.2	27.6	22.92	45.20	37.0	34.8
1969	28.4	28.9	24.18	46.99	38.3	36.7
1970	29.9	30.5	25.94	49.24	40.1	38.8
1971	31.5	32.1	28.24	51.88	41.7	40.5
1972	33.0	33.4	31.01	51.73	42.8	41.8
1973	34.4	35.3	33.66	52.09	44.2	44.4
1974	36.9	38.5	37.24	54.20	50.5	49.3
1975	40.7	42.1	41.10	57.05	58.2	53.8
1976	43.7	44.6	43.85	58.62	62.1	56.9
1977	47.0	47.4	47.21	62.69	66.1	60.6
1978	50.3	50.9	50.82	67.99	71.3	65.2
1979	54.4	55.2	55.81	73.72	77.5	72.6
1980	59.3	60.3	62.05	78.90	85.8	82.4
1981	65.1	66.0	68.23	86.44	94.6	90.9
1982	69.7	70.2	72.96	91.69	100.0	96.5
1983	72.9	73.2	76.20	95.75	102.8	99.6
1984	75.8	75.9	81.23	99.50	105.2	103.9
1985	78.4	78.5	83.51	99.93	107.5	107.6
1986	80.6	80.6	84.49	98.53	109.7	109.6
1987	82.9	83.1	85.62	94.38	111.7	113.6
1988	85.8	86.1	87.30	93.88	114.3	118.3
1989	89.4	89.7	89.79	94.64	118.8	124.0
1990	93.2	93.6	92.92	96.81	122.9	130.7
1991	97.2	97.3	96.47	98.84	126.7	136.2
1992	100.0	100.0	100.00	100.00	129.1	140.3
1993	102.6	102.6	101.77	101.72	131.4	144.5
1994	105.1	105.1	103.63	105.23	134.1	148.2
1995	107.8	107.8	106.48	108.02	136.7	152.4
1996	110.3	110.2	109.98	108.74	138.3	156.9
1997	112.7	112.5	112.00	106.61	138.2	160.5
1998[E]	114.9	114.6	NA	NA	NA	164.1
1999[E]	117.2	116.9	NA	NA	NA	167.7

Source: Bureau of Economic Analysis, "Current Business Statistics" (Monthly) and Price Measurement Branch; Council of Economic Advisers, "Economic Report of the President" (Annually); and Office of Management and Budget, "The Budget of the United States Government" (Annually).

E Estimate.

NA Not Available.

r Revised.

Key: PPI = Producer Price Index for Capital Equipment.
CPI = Consumer Price Index, All Items, All Urban Consumers for 1978 and subsequent years. Previous years, All Urban Wage Earners.
GDP = Gross Domestic Product.

PRICE DEFLATORS FOR AEROSPACE INDUSTRY

Calendar Years 1972–1997

Year	Aerospace Deflators (1987 = 100)					
	Composite	SIC 3721	SIC 3724	SIC 3728	SIC 3761	SIC 3764,9
1972	33.7	39.9	30.1	36.6	39.7	34.4
1973	37.7	41.2	30.9	38.1	39.4	35.6
1974	41.5	44.8	34.9	44.0	41.6	40.5
1975	46.6	48.3	42.3	51.6	45.2	49.2
1976	51.0	52.8	45.9	56.5	50.4	53.8
1977	54.6	56.2	49.1	58.7	55.6	58.2
1978	57.5	59.3	54.6	55.2	60.7	63.6
1979	63.5	65.3	60.9	58.9	69.7	70.0
1980	70.6	72.9	66.3	65.3	78.9	78.5
1981	79.5	80.8	77.0	74.9	87.1	89.5
1982	87.9	89.8	85.2	84.3	93.4	97.2
1983	92.2	94.4	89.5	87.9	98.6	101.5
1984	99.8	105.9	98.1	93.6	100.7	102.9
1985 [a]	98.7	100.7	99.2	94.4	102.4	103.2
1986	99.8	100.6	99.3	97.9	103.5	102.4
1987	100.0	100.0	100.0	100.0	100.0	100.0
1988	101.9	102.2	103.0	103.5	95.0	100.3
1989	106.1	111.0	105.8	106.8	91.4	100.6
1990	110.5	116.8	111.7	109.8	91.5	98.1
1991	114.6	121.3	117.0	113.6	94.4	94.6
1992 [b]	118.2	125.2	122.7	118.0	93.1	83.5
1993	121.2	129.5	124.7	120.9	94.3 [r]	84.6 [r]
1994	123.8 [r]	133.9	128.0	123.5	93.4 [r]	80.4 [r]
1995	125.7 [r]	138.3	129.9	124.4	91.8 [r]	77.3
1996	127.4 [r]	141.5	132.4	128.8	88.4 [r]	77.0 [r]
1997	130.0	143.4	133.7	131.4	90.0	79.4

Source: Aerospace Industries Association, based on data from: Bureau of Labor Statistics, Producer Price Indices; Bureau of Economic Analysis, Chain-Type Price Indexes and Implicit Price Deflators; and International Trade Administration.

a The International Trade Administration has discontinued its reporting of the Aerospace Deflators with 1986. Subsequent composite deflators computed by AIA and deflators for 1985 and 1986 revised for consistency.

b The Bureau of Economic Analysis discontinued its reporting in 1995 of the National Defense Purchases Deflators (used in AIA's Composite calculations). 1992-1994 revised using 1992 fixed weights and BEA's Chain-Type Price Indexes for National Defense Investment and Consumption Expenditures.

Key: SIC = Standard Industrial Classification, SIC 3721 = Aircraft; SIC 3724 = Aircraft Engines and Engine Parts; SIC 3728 = Aircraft Parts; SIC 3761 = Missiles and Space Vehicles; SIC 3764 = Space Propulsion; SIC 3769 = Space Equipment not elsewhere classified.

r Revised.

Aircraft Production

AIRCRAFT SECTOR SALES received a significant boost in 1997, thanks to a very strong civil market and steady sales of military aircraft and parts, according to the Census Bureau. Overall, sales totaled to $67 billion, an increase of 16% over the previous year's level of $58 billion. As usual, aircraft sector sales were the largest component of the industry's overall sales volume.

The gains were fueled by civil sales, which rose to $42.3 billion from $32.7 billion the previous year, a jump of 29%. Military sales were nearly even with the previous year, at $24.6 billion (compared with $24.8 billion in 1996). Overall, in inflation-adjusted constant dollars, aircraft sector sales grew for the second year in a row, after a 5-year decline.

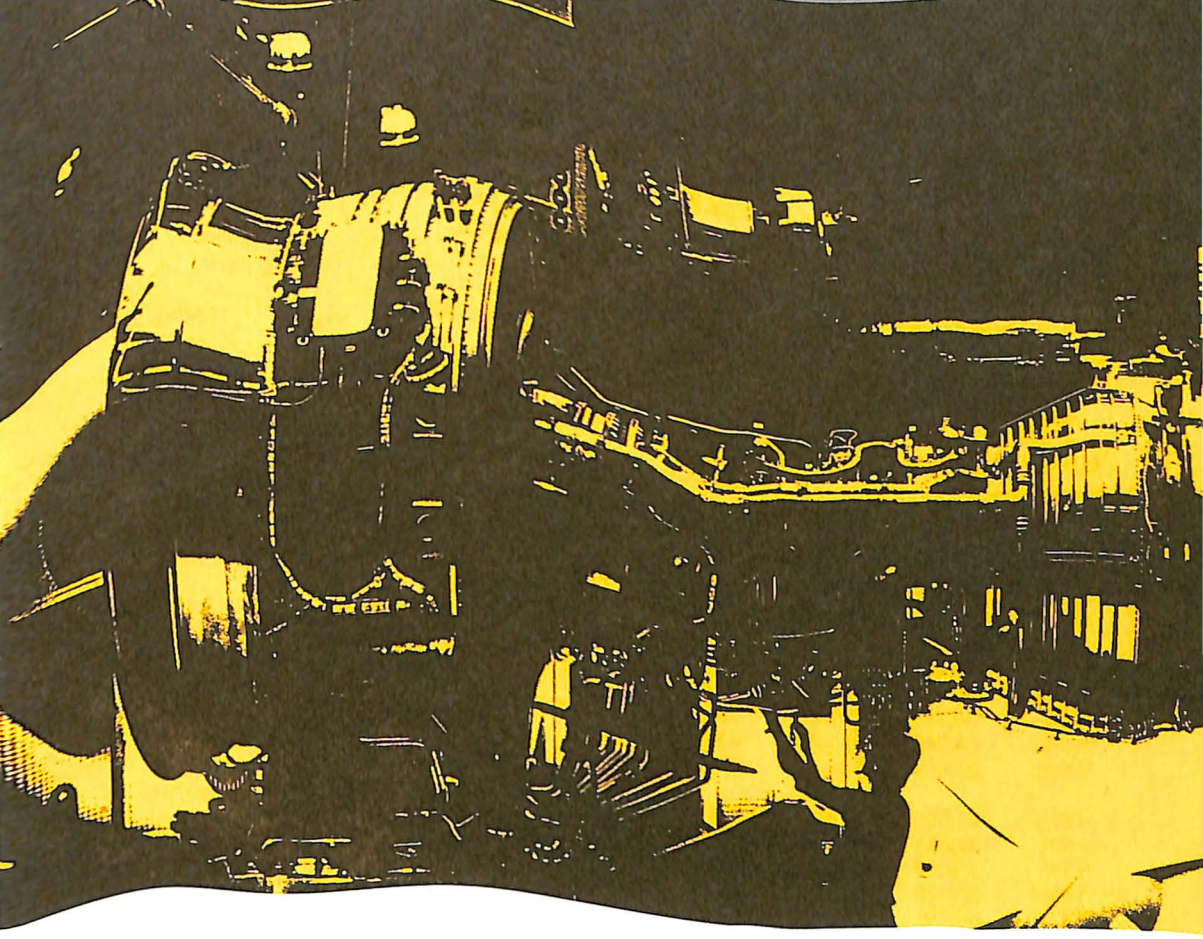
Census figures also showed another increase in new orders for aircraft, engines, and parts in 1997. Total orders came to $73 billion, up from a revised figure of $71 billion for the previous year. Civil orders were behind the increase, rising from $45.3 billion in 1996 to $51.5 billion in 1997. In contrast, military orders fell from $25.3 billion to $21.2 billion in the same period.

The backlog at year-end 1997 reached $159 billion, up from $154 billion at year-end 1996. The growth in the 1997 backlog was also driven by orders for civil aircraft, engines, and parts, which accounted for $115 billion, or 72%, of the total. The backlog for military orders dropped to $44 billion from $48 billion the previous year.

The largest component of the "non-military" sales category was complete civil aircraft shipments. The industry delivered 2,289 civil aircraft, 612 more than the previous year. That total breaks down into 374 commercial transports (up 105), 346 helicopters (up 68), and 1,569 general aviation aircraft (up 439). In dollar value, 85% of the total value of shipments were transport aircraft ($27 billion out of a $32 billion total). Helicopter sales came to $231 million, up from $193 million in 1996, and general aviation aircraft sales climbed to $4.7 billion, up from $3.1 billion, marking another record high year for sales in the general aviation category.

The backlog for civil transports increased in 1997, marking the third year of growth. At year-end 1997, the number of planes on backlog rose to 1,744 from 1,617 at year-end 1996.

Military aircraft production for 1997 amounted to 510 units. Of that total, 337 were exported either through Foreign Military Sales or by direct company-to-foreign customer sales and 173 were delivered to U.S.



military agencies. The comparable figures for 1996 were 558 total, 316 exports, and 242 for the U.S. military services.

For FY 1998, the largest military aircraft procurement was $2.1 billion for nine C-17 Globemaster III transports for the Air Force. Other major procurements included: $2.1 billion for 20 Navy F/A-18E/F fighters; $673 million for seven Navy/Marine Corps V-22 Ospreys; $500 million for Army AH-64 Apache helicopters; $328 million for one USAF E-8C JSTARS surveillance aircraft; $312 million for four Navy E-2C Hawkeye early warning and control aircraft; $294 million for 12 Navy/Marine Corps AV-8B Harrier V/STOL fighters; and $290 million for 28 Army UH-60 Black Hawk helicopters. The principal procurements planned for FY 1999 were: $2.9 billion for additional C-17 Globemasters, $2.9 billion for F/A-18E/Fs, $785 million for Air Force F-22 Raptors, $687 million for Navy/Marine Corps V-22 Ospreys, and $612 million for Army Apaches.

SALES OF AIRCRAFT, ENGINES, AND PARTS

Calendar Years 1983–1997

(Millions of Dollars)

Year	GRAND TOTAL	TOTAL		Complete Aircraft & Parts		Aircraft Engines & Parts	
		Military	Non-Mil.	Military	Non-Mil.	Military	Non-Mil.
CURRENT DOLLARS							
1983	$35,879	$19,809	$16,070	$15,651	$11,666	$4,158	$ 4,404
1984	37,285	23,268	14,017	18,218	10,039	5,050	3,978
1985	43,940	25,758	18,182	21,642	12,607	4,116	5,575
1986	47,757	27,043	20,714	23,089	14,876	3,954	5,838
1987	49,062	27,806	21,256	22,168	14,862	5,638	6,394
1988	50,742	25,068	25,674	19,030	16,681	6,038	8,993
1989	53,825	24,287	29,538	18,256	20,140	6,031	9,398
1990	66,289	27,667	38,622	22,023	27,872	5,644	10,750
1991	68,540	25,385	43,155	19,710	33,215	5,675	9,940
1992	67,669	23,509	44,160	18,411	35,595	5,098	8,565
1993	61,086	20,099	40,987	16,118	32,780	3,981	8,207
1994	54,553	23,652	30,901	20,127	23,176	3,525	7,725
1995	55,029	22,944	32,085	19,596	22,897	3,348	9,188
1996[r]	57,526	24,804	32,722	20,822	20,993	3,982	11,729
1997	66,893	24,580	42,313	21,297	33,193	3,283	9,120
CONSTANT DOLLARS [a]							
1983	$38,914	$21,485	$17,430	$16,975	$12,653	$4,510	$ 4,777
1984	37,360	23,315	14,045	18,255	10,059	5,060	3,986
1985	44,519	26,097	18,421	21,927	12,773	4,170	5,648
1986	47,853	27,097	20,756	23,135	14,906	3,962	5,850
1987	49,062	27,806	21,256	22,168	14,862	5,638	6,394
1988	49,796	24,601	25,195	18,675	16,370	5,925	8,825
1989	50,731[r]	22,891	27,840	17,206	18,982	5,684	8,858
1990	59,990	25,038	34,952	19,930	25,224	5,108	9,729
1991	59,808	22,151	37,657	17,199	28,983	4,952	8,674
1992	57,250	19,889	37,360	15,576	30,114	4,313	7,246
1993	50,401	16,583	33,818	13,299	27,046	3,285	6,771
1994[r]	44,065	19,105	24,960	16,258	18,721	2,847	6,240
1995[r]	43,778	18,253	25,525	15,589	18,216	2,663	7,309
1996[r]	45,154	19,469	25,684	16,344	16,478	3,126	9,206
1997	51,456	18,908	32,548	16,382	25,533	2,525	7,015

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)" Series MA37D (Annually).

a Based on AIA's aerospace composite price deflator, 1987=100.

r Revised.

ORDERS AND BACKLOG OF AIRCRAFT, ENGINES, AND PARTS

Calendar Years 1983–1997

(Millions of Current Dollars)

Year	GRAND TOTAL	TOTAL		Complete Aircraft & Parts		Aircraft Engines & Parts	
		Military	Non-Mil.	Military	Non-Mil.	Military	Non-Mil.
NET NEW ORDERS							
1983	$ 33,599	$26,231	$ 12,368	$21,494	$ 7,596	$4,737	$ 4,772
1984	47,102	29,894	17,208	23,312	14,064	6,582	3,144
1985	49,942	28,201	21,741	24,526	15,689	3,675	6,052
1986	47,957	24,124	23,833	19,852	17,592	4,272	6,241
1987	52,347	19,347	33,000	15,070	24,083	4,277	8,917
1988	82,148	24,242	57,906	17,493	41,762	6,749	16,144
1989	96,591	28,818	67,773	23,569	52,619	5,249	15,154
1990	82,386	17,735	64,651	12,766	52,371	4,969	12,280
1991	67,490	26,675	40,815	22,140	30,745	4,535	10,070
1992	49,741	19,631	30,110	16,391	20,548	3,240	9,562
1993	35,608	19,518	16,090	15,853	11,238	3,665	4,852
1994	43,518	23,352	20,166	19,806	12,854	3,546	7,312
1995	56,321	19,854	36,467	16,248	27,156	3,606	9,311
1996[r]	70,624	25,343	45,281	21,755	33,802	3,588	11,479
1997	72,681	21,155	51,526	19,102	41,408	2,053	10,118
BACKLOG AS OF DECEMBER 31							
1983	$ 60,372	$38,824	$ 21,548	$32,227	$ 15,241	$6,597	$ 6,307
1984	70,189	45,450	24,739	37,321	19,266	8,129	5,473
1985	76,191	47,893	28,298	40,205	22,348	7,688	5,950
1986	76,391	44,974	31,417	36,968	25,064	8,006	6,353
1987	80,015	36,514	43,501	29,869	34,625	6,645	8,876
1988	111,280	35,515	75,765	28,186	59,679	7,329	16,086
1989	159,150	44,026	115,124	36,888	95,108	7,138	20,016
1990	172,940	33,788	139,152	27,259	119,123	6,529	20,029
1991	173,676	39,149	134,527	32,795	116,139	6,354	18,388
1992	168,577	44,255	124,322	39,748	107,686	4,507	16,636
1993	142,405	46,177	96,228	41,732	82,772	4,445	13,456
1994	129,929	44,624	85,305	40,206	72,295	4,418	13,010
1995	136,871	44,642	92,229	39,673	77,802	4,969	14,427
1996[r]	153,976	47,635	106,341	42,788	91,851	4,847	14,490
1997	158,637	43,927	114,710	40,593	100,155	3,334	14,555

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)" Series MA37D (Annually).

r Revised.

U.S. AIRCRAFT PRODUCTION—CIVIL

Calendar Years 1969–1997

Year	TOTAL	Domestic Shipments			Export Shipments		
		Trans-ports	Heli-copters	General Aviation	Trans-ports	Heli-copters	General Aviation
1969	13,505	332	282	9,996	182	252	2,461
1970	8,076	127	150	5,246	184	332	2,037
1971	8,158	50	171	5,900	173	298	1,566
1972	10,576	79	319	7,702	148	256	2,072
1973	14,709	143	342	10,482	151	428	3,163
1974	15,326	91	433	9,903	241	395	4,263
1975	15,251	127	528	10,804	188	336	3,268
1976	16,429	64[a]	442	12,232	158	315	3,218
1977	17,913	54	527	13,441	101	321	3,469
1978	18,962	130	536	14,346	111	368	3,471
1979	18,460	176	570	13,177	200	459	3,878
1980	13,634	150	841	8,703	237	525	3,178
1981	10,916	132	619	6,840	255	453	2,617
1982	5,085	111	333	3,326	121	254	940
1983	3,356	133	187	2,172	129	216	519
1984	2,999	102	143	2,013	83	233	425
1985	2,691	126	247	1,545	152	137	484
1986	2,156	171	120	1,031	159	210	464
1987	1,800	187	116	598	170	242	487
1988	1,949	206	103	500	217	280	643
1989	2,448	138	221	225	260	294	1,310
1990	2,268	215	254	335	306	349	809
1991	2,181	204	253	487	385	318	534
1992	1,790	180	112	541	387	212	358
1993	1,630	130	83	631	278	175	333
1994	1,545	87	154	543	222	154	385
1995	1,625	119	82	714	137	210	363
1996	1,677	97	64	747	172	214	383
1997	2,289	122	87	1,160	252	259	409

Source: Aerospace Industries Association, based on company reports; General Aviation Manufacturers Association; and Department of Commerce, International Trade Administration.

a Prior to 1976, includes the C-130 military transport.

U.S. AIRCRAFT PRODUCTION—MILITARY

Calendar Years 1969–1997

Year	TOTAL	U.S. Military Agencies	Exports		
			Total	FMS[a]	Direct[b]
1969	4,290	3,644	646	NA	NA
1970	3,720	3,085	635	NA	NA
1971	2,914	2,232	682	NA	NA
1972	2,530	1,993	537	124	413
1973	1,821	1,243	578	129	449
1974	1,513	799	714	365	349
1975	1,779	844	935	525	410
1976	1,318	625	693	518	175
1977	1,134	454	680	408	272
1978	996	467	529	256	273
1979	837	531	306	203	103
1980	1,047	625	422	194	228
1981	1,062	703	359	215	144
1982	1,159	690	469	68	401
1983	1,053	766	287	70	217
1984	936	561	375	71	304
1985	919	643	276	134	142
1986	1,107	708	399	110	289
1987	1,210	725	485	133	352
1988	1,305	687	618	138	480
1989	1,261	614	647	92	555
1990	1,053	664	387	99	290
1991	911	556	355	94	261
1992	753	422	331	122	209
1993	955[c]	437	518	146	372[c]
1994	764	418	346	69	277
1995	811[d]	354	457	108	349
1996	558[r]	242[r]	316	106[r]	210[r]
1997	510	173	337	192	145

Source: Aerospace Industries Association, based on USAF, USN, and USA survey responses and Department of Commerce, International Trade Administration.

a Also includes acceptances of NATO AWACS aircraft.

b Military aircraft exported via commercial contracts, directly from manufacturers to foreign governments.

c The number of small (450 kg–2000 kg), new aircraft exported doubled in 1993 to 340 worth $18 million.

d Includes 358 small (450 kg–2000 kg), new aircraft worth $14.7 million.

NA Not available.

r Revised.

CIVIL AIRCRAFT SHIPMENTS

Calendar Years 1983–1997

Year	TOTAL	Transport Aircraft[a]	Helicopters	General Aviation
NUMBER OF AIRCRAFT SHIPPED				
1983	3,356	262	403	2,691[b]
1984	2,999	185	376	2,438
1985	2,691	278	384	2,029
1986	2,155	330	330	1,495
1987	1,800	357	358	1,085
1988	1,949	423	383	1,143
1989	2,448	398	515	1,535
1990	2,268	521	603	1,144
1991	2,181	589	571	1,021
1992	1,790	567	324	899
1993	1,630	408	258	964
1994	1,545	309	308	928
1995	1,625	256	292	1,077
1996	1,677	269	278	1,130
1997	2,289	374	346	1,569
VALUE—Millions of Dollars				
1983	$ 9,773	$ 8,000	$303	$1,470[b]
1984	7,717	5,689	330	1,698
1985	10,385	8,448	506	1,431
1986	11,858	10,308	288	1,262
1987	12,148	10,507	277	1,364
1988	15,855	13,603	334	1,918
1989	17,129	15,074	251	1,804
1990	24,477	22,215	254	2,008
1991	29,035	26,856	211	1,968
1992	30,728	28,750	142	1,836
1993	26,389	24,133	113	2,144
1994	20,666	18,124[E]	185	2,357
1995	18,299	15,263[E]	194	2,842
1996	20,884	17,564[E]	193	3,127
1997	31,834	26,929	231	4,674

Source: Aerospace Industries Association, based on company reports and General Aviation Manufacturers' Association.

a U.S.-manufactured fixed-wing aircraft over 33,000 pounds empty weight, including all jet transports plus the four-engine turboprop-powered Lockheed L-100.

b Includes 3 off-the-shelf Gulfstream G-III's delivered to the U.S. Air Force for C-20 VIP transports.

E Estimated.

CIVIL TRANSPORT AIRCRAFT BACKLOG[a]

As of December 31, 1993–1997

Company and Model	1993	1994	1995	1996	1997
TOTAL AIRCRAFT ON ORDER					
(Domestic and Foreign Orders)	1,356	1,126	1,291	1,617	1,744
Value (Millions of Dollars)	$77,735	$67,709[E]	NA	NA	$93,788
Boeing—TOTAL	1,153	959	1,079	1,418	1,602
B-737	463	391	491	764	909
B-747	156	111	121	161	159
B-757	246	182	132	134	133
B-767	141	128	118	86	141
B-777	147	147	217	273	260
Douglas—TOTAL	203	167	212	199	142
MD-11	60	45	21	15	14
MD-80/90	143	122	141	134	78
MD-95	—	—	50	50	50
TOTAL FOREIGN ORDERS	661	539	701	753	790
Value (Millions of Dollars)	$50,409	$42,962[E]	NA	NA	$51,583[E]
Boeing—TOTAL	511	415	570	637	709
B-737	152	132	199	234	336
B-747	143	103	112	133	122
B-757	48	28	21	25	38
B-767	66	50	58	38	29
B-777	102	102	180	207	184
Douglas—TOTAL	150	124	131	116	81
MD-11	56	39	14	14	13
MD-80/90	94	85	117	102	68
MD-95	—	—	—	—	—

Source: Aerospace Industries Association, based on company reports.
NOTE: Boeing's unfilled orders not reported on a firm order basis.
a Unfilled firm orders excluding options for U.S.-manufactured transport aircraft over 33,000 pounds. Includes new transports contracted for lease from the manufacturer.
E Estimate.
NA Not available.

SHIPMENTS OF CIVIL TRANSPORT AIRCRAFT[a]

Calendar Years 1993–1997

Company and Model	1993	1994	1995	1996	1997
TOTAL					
Number of Aircraft Shipped	408	309	256	269	374
Value (Millions of Dollars)	$24,133	$18,124[E]	$15,263[E]	$18,915[E]	$26,929
Boeing—TOTAL	330	270	206	218	320
B-737	152	121	89	76	135
B-747	56	40	25	26	39
B-757	71	69	43	42	46
B-767	51	40	36	42	41
B-777	—	—	13	32	59
Douglas—TOTAL	78	39	50	51	54
MD-11	36	17	18	15	12
MD-80	42	22	18	12	16
MD-90	—	—	14	24	26

Source: Aerospace Industries Association, based on company reports.
a U.S.-manufactured fixed-wing aircraft over 33,000 lbs.
E Estimated.

SPECIFICATIONS OF U.S. CIVIL JET TRANSPORT AIRCRAFT[a]

On Order or in Production as of 1997

Number of Engines and Crew, and Model Designation[b]	Initial Service	Standard Mixed Class	Operating Empty Weight (000's lbs)	Maximum Takeoff Gross Weight (000's lbs)	Range (Nautical Miles)[c]	Engine Manufacturer[d] and Model
FOUR ENGINES/CREW OF 2						
747-400*	1989	380-585	404	800-875	6,060 -7,200	GE CF6-80C2, P&W PW4000, or RR RB211-524
THREE ENGINES/CREW OF 2						
MD-11*	1989	250-410	287	631	6,840	GE CF6-80C2-DF1 or P&W PW4460
MD-11ER*	1996	250-410	287	631	7,220	GE CF6-80C2-DF1 or P&W PW4460
TWO ENGINES/CREW OF 2						
737-300	1984	128-149	72-73	125-140	2,270	CFMI CFM56-3C-1
737-400	1988	146-168	76-78	139-150	2,090	CFMI CFM56-3C-1
737-500	1990	108-132	70-71	116-134	2,400	CFMI CFM56-3C-1
737-600	1998	108-132	81	124-144	3,230	CFMI CFM56-7B
737-700	1997	128-149	83	133-153	3,200	CFMI CFM56-7B
737-800	1998	162-189	91	156-173	2,900	CFMI CFM56-7B
757	1983	194-231	128	220-255	2,500 -3,900	RR RB211-535 or P&W PW2000
767-200*	1982	181-285	186	395	6,670	P&W PW4000, GE CF6-80C2, or RR RB211-524
767-300*	1986	218-325	200	412	6,200	P&W PW4000, GE CF6-80C2, or RR RB211-524
777-200*	1995	305-440	303-318	506-648	5,230 -7,470	RR Trent, GE GE90, or P&W PW4000
777-300*	1998	368-550	348	580-660	5,820	RR Trent, GE GE90, or P&W PW4000
MD-80 series:						
MD-81	1980	155	80	140	1,565	P&W JT8D-209 or P&W JT8D-217A
MD-82	1981	155	80	150	2,076	P&W JT8D-217C
MD-83	1985	155	81	160	2,534	P&W JT8D-219
MD-87	1987	130	76	140	2,405	P&W JT8D-217C
MD-88	1987	155	82	150	2,534	P&W JT8D-219C or P&W JT8D-217C
MD-90	1995	155	88	156	2,400	IAE V2500-D5
MD-95	1999	106	67	114	1,547	BMW-RR BR715

Source: Aerospace Industries Association, based on company reports.

a All jet-powered passenger transport aircraft 33,000 pounds or more empty weight.

b The Boeing Company manufacturers models: 737, 747, 757, 767, & 777 and its Douglas Products Division manufacturers models: MD-11, MD-80, MD-90, and MD-95 (renamed the 717).

c Full passenger load and baggage.

d P&W = Pratt & Whitney; GE = General Electric; RR = Rolls-Royce; CFMI = General Electric/Snecma; IAE = International Aero Engines; BMW = Bayerische Motoren Werke.

* Wide-body aircraft.

SPECIFICATIONS OF U.S. CIVIL HELICOPTERS

In Production as of 1997

Company	Commercial Model	Number of Places	Useful Load (Lbs.)	Range with Useful Load (N.Miles)	External Cargo Payload (Lbs.)
Enstrom Helicopter	F-28 Series	3	1,030	241	1,000
	280 Series	3	1,015	260	1,000
	480 Series	5	1,175	375	1,000
Hiller Aircraft	UH-12E3	3	1,341	232	1,000
	UH-12E3T	3	1,460	172	1,000
Kaman	K-1200	1	500	265	6,000
McDonnell Douglas Helicopter	500 Series	5	1,519	264	2,069
	520 Series	5	1,764	210	2,364
	600 Series	8	2,170	380	2,720
	900 Series	8	2,975	NA	3,000
Robinson Helicopter	R22	2	531	180	—
	R44	4	980	365	—
Schweizer Aircraft	300C	3	950	201	1,050
	300CB	2	662	NA	—
	330	4	1,120	300	—
Sikorsky Aircraft	S-76C	14	4,813	439	3,300

Source: Helicopter Association International, "1998 Helicopter Annual" (Annually).
NA Not available.

CIVIL HELICOPTER SHIPMENTS[a]

Calendar Years 1993–1997

Company and Model	1993	1994	1995	1996	1997
CIVIL SHIPMENTS	258	308	292	278	346
Value (Millions of Dollars)	$113	$185	$194	$193	$231
Bell—TOTAL	2	—	—	—	—
214 series	2	—	—	—	—
Enstrom—TOTAL	10	17	11	11	12
F-28/280 series	8	13	3	4	5
480 series	2	4	8	7	7
Hiller[b]—TOTAL	—	—	1	1	—
UH12E	—	—	1	1	—
Kaman—TOTAL	—	5	6	8	4
K-1200	—	5	6	8	4
McDonnell Douglas—TOTAL	26	36	34	29	27
500 series	5	3	12	9	9
520N series	21	9	10	5	2
530 series	—	22	—	—	—
600 series	—	—	—	—	15
900 series	—	2	12	15	1
Robinson—TOTAL	166	195	179	164	246
R22	135	89	83	86	132
R44	31	106	96	78	114
Schweizer—TOTAL	45	40	47	56	39
300C	40	35	22	20	15
300CB	—	—	21	31	19
330	5	5	4	5	5
Sikorsky—TOTAL	9	15	14	9	18
S-76	9	15	14	9	18

Source: Aerospace Industries Association, based on company reports.
NOTE: All data exclude production by foreign licensees.
a Domestic and export helicopter shipments for non-military use. Helicopters in military configuration exported to foreign governments and purchased under commercial contract are reported elsewhere. Models which may be shipped in either a civil or a military configuration appear in both tables.
b Formerly reported as Rogerson.

DIRECT EXPORT SHIPMENTS OF MILITARY HELICOPTERS[a]

Calendar Years 1993–1997

Manufacturer and Model	1993	1994	1995	1996	1997
DIRECT MILITARY EXPORT SHIPMENTS	64	30	21	8	25
Value (Millions of Dollars)	$429	$248	$142	$131	$213
Boeing Vertol CH-47/414/352	—	—	2	7	1
Hiller UH-12E	—	—	—	—	2
Sikorsky S-70C	64	29	19	1	22
Sikorsky S-80M	—	1	—	—	—

Source: Aerospace Industries Association, company reports.

a Shipments of helicopters in military configuration exported directly from U.S. manufacturers to foreign governments. Military helicopters exported via Foreign Military Sales (FMS) are reported with Dept. of Defense (DoD) aircraft acceptance data elsewhere in this chapter. Some models reported on this page may be shipped in either military or civil configuration; see Civil Helicopter Shipments table for additional data.

GENERAL AVIATION AIRCRAFT SHIPMENTS

By Selected Manufacturers
Calendar Years 1993–1997

	1993	1994	1995	1996	1997
NUMBER OF AIRCRAFT SHIPPED	964	928	1,077	1,130	1,569
Single-Engine, Piston	516	444	515	530	905
Multi-Engine, Piston	39	55	61	70	80
Turboprop	211	207	255	289	236
Turbojet	198	222	246	241	348
VALUE OF SHIPMENTS[a] (Millions of Dollars)	$2,144	$2,357	$2,842	$3,127	$4,674
Piston	$ 76	$ 94	$ 123	$ 146	$ 214
Turboprop	595	595	653	734	740
Turbojet	1,473	1,681	2,066	2,247	3,720
Number of Aircraft By Selected Manufacturer					
American Champion	38	22	46	53	46
American General	30	—	—	—	—
Aviat	56	47	42	56	61
Bellanca	4	2	1	2	2
Cessna	173	172	200	229	612
Classic	7	4	7	6	6
Commander	31	22	25	15	14
Fairchild	20	16	7	7	—
Gulfstream	26	22	26	27	51
Lake	3	—	—	—	—
Learjet	38	36	43	34	45
Maule	70	65	68	63	54
Mooney	64	71	84	73	86
Piper	99	132	165	183	222
Raytheon[b]	305	317	363	382	370

Source: General Aviation Manufacturers' Association.
a Manufacturers' net billing price.
b Formerly reported as Beech.

MILITARY AIRCRAFT ACCEPTED BY U.S. MILITARY AGENCIES

Number and Flyaway Value
Calendar Years 1983–1997

Year	TOTAL	Bomber/ Patrol/ Command/ Control	Fighter/ Attack	Trans- port/ Tanker	Trainer	Heli- copter	Other
NUMBER							
1983	836	34	421	22	120	233	6
1984	632	34	298	18	30	240	12
1985	777	34	409	25	—	306	3
1986	818	52	424	76	—	266	—
1987	858	74	483	36	—	265	—
1988	842	55	509	31	—	247	—
1989	706	24	408	21	—	253	—
1990	763	24	454	25	—	260	—
1991	650	17	395	23	—	215	—
1992	544	10	312	30	37	155	—
1993	583	11	293	25	56	198	—
1994	487	6	167	40	114	157	3
1995	462	4	133	32	102	176	15
1996	348	4	116[r]	28	54	146[r]	—
1997	365	4	213	19	43	86	—
FLYAWAY VALUE—Millions of Dollars							
1983	$ 9,640	$1,259	$6,708	$ 575	$ 79	$1,009	$10
1984	9,308	1,270	5,774	627	18	1,597	22
1985	14,122	3,640	7,923	838	—	1,715	6
1986	20,903	8,177	8,004	2,665	—	2,057	—
1987	21,459	8,569	8,900	2,218	—	1,772	—
1988	16,031	2,911	8,953	2,314	—	1,853	—
1989	11,968	1,423	7,735	743	—	2,067	—
1990	13,036	1,499	8,731	605	—	2,201	—
1991	11,754	1,023	8,517	437	—	1,777	—
1992	11,482	613	7,673	1,346	267	1,583	—
1993	12,101	1,530	6,400	1,553	484	2,134	—
1994	13,000	3,861	3,661	3,298	477	1,686	17
1995	12,369	3,585	3,547	2,759	460	1,922	98
1996	11,383[r]	3,596	3,524[r]	2,350[r]	337[r]	1,576[r]	—
1997	11,637	1,931	6,274	2,336	297	800	—

Source: Aerospace Industries Association, based on USAF, USN, and USA survey responses.
NOTE: Data represent new U.S.-manufactured aircraft, excluding gliders and targets. Values include spares, spare parts, and support equipment that are procured with the aircraft. Includes aircraft accepted for shipment to foreign governments for military assistance programs and foreign military sales.
r Revised.

MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES AIR FORCE[a]

Calendar Years 1996–1997
(Costs in Millions of Dollars)

Type and Model	Number		Flyaway Cost[b]		Weapon System Cost[c]	
	1996	1997	1996	1997	1996	1997
AIR FORCE—TOTAL	66	39	$6,316	$4,257	$7,933	$5,239
Bomber—TOTAL	4	2	$3,596	$1,799	$4,756	$2,391
B-2	4	2	3,596	1,799	4,796	2,391
Fighter/Attack—TOTAL	18	3	412	66	603	70
AC-130	—	1	—	44	—	48
F-16	18	2	412	22	603	23
Transports/Tankers—TOTAL	9	11	2,173[r]	2,226	2,422	2,594
C-17	6	7	2,058[r]	2,102	2,290	2,470
C-20H	1	—	27	—	36	—
C-130 variants	2	4	88	124	96	124
Trainer—TOTAL	35	15	135[r]	60	152	73
T-1A	35	15	135[r]	60	152	73
Helicopters—TOTAL	—	8	—	106	—	111
H-60	—	8	—	106	—	111

Source: Department of the Air Force.
a Air Force acceptances for own use; excludes FMS/MAP shipments.
b Flyaway Cost includes airframe, engines, electronics, communications, armament, other installed equipment, and non-recurring costs associated with the manufacture of aircraft.
c Weapon system cost includes flyaway costs, peculiar ground equipment, training equipment, and technical data.
r Revised.

MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES ARMY[a]

Calendar Years 1996–1997

Type and Model	Number		Flyaway Cost[b]		Weapon System Cost[c]	
	1996	1997	1996	1997	1996	1997
ARMY—TOTAL	112	59	$850	$408	$984	$447
Helicopters—TOTAL	87	54	$785	$386	$919	$425
AH-64	18	—	313[E]	—	408[E]	—
UH-60L	69	54	471	386	511	425
Transports/Tankers—TOTAL	15	5	57	22	57	22
C-12	14	—	52	—	52	—
UC-35	1	5	5	22	5	22
Trainer—TOTAL	10	—	8	—	8	—
TH-67	10	—	8[E]	—	8[E]	—

Source: Department of the Army.
a Army acceptances for own use; excludes FMS/MAP shipments.
b Flyaway cost includes airframes, engines, electronics, communications, armament and other installed equipment.
c Weapon System Cost includes flyaway cost, initial spares, ground equipment, training equipment and other support items.
E Estimate.
r Revised.

MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES NAVY[a]

Calendar Years 1996–1997
(Costs in Millions of Dollars)

Type and Model	Number		Flyaway Cost[b]		Weapon System Cost[c]	
	1996	1997	1996	1997	1996	1997
NAVY—TOTAL	64	75	$1,625[r]	$1,660	$1,980[r]	$1,896
Patrol—TOTAL	—	2	$ —	$ 131	$ —	$ 141
E-2	—	2	—	131	—	141
Fighter/Attack—TOTAL	28	31	1,007[r]	1,115	1,243[r]	1,271
F/A-18	24	27	883	1,011	1,099	1,140
AV-8B	4	4	124[r]	104	144[r]	131
Transports/Tankers—TOTAL	4	—	120	—	129	—
C-130T	2	—	56	—	61	—
KC-130	2	—	64	—	68	—
Trainers—TOTAL	9	28	194	237	228	270
T-39	—	17	—	27	—	43
T-45A	9	11	194	210	228	228
Helicopters—TOTAL	23	14	304	177	379	214
AH-1W	7	11	64	106	116	127
CH-53	5	3	117	71	132	87
HH-60H	9	—	103	—	110	—
SH-60B	2	—	19	—	21	—

Source: Department of the Navy.
a Navy acceptances for own use; excludes FMS shipments.
b Flyaway Cost includes airframe, engines, electronics, communications, armament, other installed equipment, non-recurring costs, and ancillary equipment.
c Weapons System Cost (Investment Cost) includes flyaway cost, initial spares, ground equipment, training equipment, and other support items.
r Revised.

MILITARY AIRCRAFT ACCEPTANCES FOR REIMBURSABLE PROGRAMS[a]

Calendar Years 1996–1997
(Millions of Dollars)

Accepting Agency, Type, and Model	Number of Aircraft Accepted		Flyaway Cost[b]	
	1996	1997	1996	1997
TOTAL ACCEPTANCES FOR REIMBURSABLE PROGRAMS ...	106[r]	192	$2,592[r]	$5,312
AIR FORCE—TOTAL	54[r]	134	$1,572	$3,668
Fighter Attack—TOTAL	54	131	1,572	3,580
F-15	11	16	594	912
F-16	43[r]	115	978	2,668
Transports/Tankers	—	3	—	88
C-130	—	3	—	88
NAVY—TOTAL	24[r]	56	$ 622[r]	$1,609
Fighter/Attack—TOTAL	16	48	533	1,513
AV-8B	5	9	128	234
F/A-18	11	39	405	1,279
Helicopters—TOTAL	8[r]	8	89[r]	96
AH-1	8[r]	8	89[r]	96
ARMY—TOTAL	28	2	$ 399	$ 35
Helicopters—TOTAL	28	2	399	35
AH-64	20	2	348[E]	35
S-76N	6	—	35[E]	—
UH-60	2	—	16	—

Source: Aerospace Industries Association, based on USAF, USN, and USA survey responses.
a Foreign government aircraft purchases through the Department of Defense Foreign Military Sales program.
b Flyaway cost includes airframes, engines, electronics, communications, armament, other installed equipment, and non-recurring costs associated with the manufacture of the aircraft.
E Estimate.
r Revised.

MILITARY AIRCRAFT PROGRAM PROCUREMENT

Fiscal Years 1997, 1998, and 1999
(Millions of Dollars[a])

Agency and Model	1997		1998 E		1999 E	
	No.	Cost	No.	Cost	No.	Cost
AIR FORCE						
B-1B	—	$ 21.2	—	$ 10.6	—	$ —
B-2 Spirit	—	85.8	—	323.4	—	189.9
C-17 Globemaster III	8	2,075.2	9	2,130.5	13	2,900.5
C-130 Hercules	1	62.7	—	23.5	1	75.0
Civil Air Patrol Aircraft	27	2.6	27	3.0	27	2.6
E-8C JSTARS	2	534.7	1	327.7	2	463.1
EC-130J	1	70.2	1	48.8	—	—
F-15E Eagle	6	247.0	5	232.0	—	—
F-16 Falcon	6	154.3	3	80.7	—	—
F-22	—	7.5	—	73.2	2	785.3
HH-60G	8	107.5	—	—	—	—
JPATS	15	66.9	22	75.9	19	107.1
Unmanned Aerial Vehicles	14	105.2	20	138.3	15	115.0
VCX	2	99.1	3	191.8	2	160.9
WC-130	3	165.2	2	115.0	—	—
ARMY						
AH-64 Apache	—	$ 403.1	—	$ 499.7	—	$ 611.8
C-XX	5	21.8	5	22.5	—	—
OH-58D Kiowa Warrior	—	197.1	—	57.1	—	40.4
TIARA	2	34.6	—	52.9	—	15.0
UH-60 Black Hawk	34	280.4	28	290.3	22	218.8
NAVY						
AV-8B Harrier	12	$ 354.0	12	$ 294.4	12	$ 338.4
CH-60	—	—	2	29.7	4	132.2
E-2C Hawkeye	4	295.4	4	311.7	3	389.3
EA-6B Prowler	—	218.0	—	113.3	—	75.7
F/A-18C/D	6	272.0	—	—	—	—
F/A-18E/F Hornet	12	2,038.1	20	2,112.8	30	2,897.2
KC-130J	3	208.0	2	117.1	—	—
SH-60B Seahawk	—	10.2	—	—	—	—
T-45 Goshawk	12	288.5	15	284.7	15	342.8
V-22 Osprey[b]	5	659.4	7	672.6	7	687.1

Source: Department of Defense Budget, "Program Acquisition Costs by Weapon System" (Annually) and "Procurement Programs (P-1)" (Annually).
NOTE: See Research and Development Chapter for aircraft program RDT&E authorization data.
a Total Obligational Authority for procurement, excluding initial spares.
b Air Force and Navy funding.
E Estimate. Latest year reflects Administration's budget proposal.

ACTIVE U.S. MILITARY AIRCRAFT[a]

Fiscal Years 1980–1997

Year	Total[a]	Fixed-Wing Aircraft				Helicopters
		Total	Jet	Turboprop	Piston	
1980	18,969	11,362	8,794	1,869	699	7,607
1981	19,363	11,645	9,111	1,943	591	7,718
1982	21,728	12,063	9,647	1,900	516	9,665
1983	18,652	11,603	9,495	1,745	363	7,049
1984	18,833	11,661	9,551	1,777	333	7,172
1985	19,333	11,929	9,640	1,881	408	7,404
1986	20,157	11,919	9,730	1,803	386	8,238
1987	20,514	12,054	9,819	1,865	370	8,460
1988	21,010	12,481	9,954	2,222	305	8,529
1989	19,223	11,893	9,501	2,131	261	7,330
1990	20,017	12,817	10,360	2,199	258	7,200
1991	19,966	12,587	10,221	2,119	247	7,379
1992	19,210	11,936	9,672	2,035	229	7,274
1993	17,231	9,681	7,651	1,852	178	7,550
1994[E]	17,018	9,803	7,786	1,835	182	7,215
1995[E]	16,207	9,277	7,294	1,754	229	6,930
1996[b]	20,554	10,154	7,798	2,199	157	10,400
1997	20,245	9,677	7,364	2,151	162	10,568

Source: Aerospace Industries Association.
a Includes Army, Air Force, Navy, and Marine regular service aircraft, as well as Reserve and National Guard Aircraft.
b Prior years data provided by Office of the Secretary of Defense and limited to aircraft in the continental United States.
E Estimate.

DEPARTMENT OF DEFENSE
OUTLAYS FOR AIRCRAFT PROCUREMENT

By Agency
Fiscal Years 1964–1999
(Millions of Dollars)

Year	TOTAL AIRCRAFT PROCUREMENT	Air Force	Navy	Army
1964	$ 6,053	$ 3,894	$ 1,859	$ 300
1965	5,200	3,115	1,739	346
1966	6,635	4,074	2,021	540
1967	8,411	4,842	2,607	962
1968	9,462	5,079	3,244	1,139
1969	9,177	5,230	2,821	1,126
1970	7,948	4,623	2,488	837
1971	6,631	3,960	2,125	546
1972	5,927	3,191	2,347	389
1973	5,066	2,396	2,557	113
1974	5,006	2,078	2,806	122
1975	5,484	2,211	3,137	136
1976	6,520	3,323	3,061	136
Tr.Qtr.	1,557	859	672	26
1977	6,608	3,586	2,721	301
1978	6,971	3,989	2,602	380
1979	8,836	5,138	3,140	558
1980	11,124	6,647	3,689	787
1981	13,193	7,941	4,397	855
1982	16,793	9,624	5,872	1,297
1983	21,013	11,799	7,490	1,724
1984	23,196	12,992	8,040	2,165
1985	26,586	15,619	8,263	2,705
1986	30,828	18,919	8,922	2,987
1987	32,956	20,036	9,614	3,306
1988	28,246	15,961	9,407	2,878
1989	27,569	14,662	10,073	2,834
1990	26,142	14,303	9,031	2,808
1991	25,689	13,794	9,055	2,840
1992	23,581	13,154	7,907	2,520
1993	20,359	11,438	7,246	1,675
1994	18,840	10,303	6,826	1,711
1995	16,125	8,891	5,685	1,549
1996	14,331	7,862	5,034	1,435
1997	14,663	7,799	5,322	1,542
1998[E]	13,553	6,748	5,436	1,369
1999[E]	14,350	6,925	5,973	1,452

Source: Office of Management and Budget, "Budget of the United States Government" (Annually).
NOTE: Detail may not add to totals because of rounding.
E Estimate. Latest year reflects Administration's budget proposal.
Tr.Qtr. See Glossary.

SPECIFICATIONS OF U.S. MILITARY AIRCRAFT

On Order or in Production as of 1997

Primary Mission, DoD Designation, & Popular Name	Manufacturer	U.S. Military Service	Crew	Empty Weight (000's lbs)	Engines	Performance Typical for Primary Mission	Remarks
ATTACK							
AV-8B Harrier II	Boeing/BAe	USMC	1	13	1xRR F402	Mach 0.91	VTOL
BOMBERS							
B-2 Spirit	NGC	USAF	2	154	4xGE F118	6,000+ n.m.	Radar eluding strategic bomber
FIGHTERS							
F-15E Eagle	Boeing	USAF	2	37	2xP&W F100	Mach 2.5 class	Dual role fighter/long range interdiction
F-16A/B Fighting Falcon	LM	USAF	1-2	17	1xP&W F100	Mach 2+ class	Multirole fighter; fully fly-by-wire; missiles, guns.
F-16C/D Fighting Falcon	LM	USAF	1-2	19	1xP&W F100/ 1xGE F110	Mach 2+ class	Provisions for AMRAAM, LANTIRN, Harpoon, HARM
F/A-18C/D Hornet	Boeing/NGC	USN/USMC	1-2	23	2xGE F404	Mach 1.8 class	Multi-mission night strike fighter
F/A-18E/F Hornet	Boeing/NGC	USN/USMC	1-2	31	2xGE F414	Mach 1.8 class	Multi-mission night strike fighter
F-22A Raptor	LM/Boeing	USAF	1	30	2xPW F119	Mach 2+ class	Air dominance with near-precision ground attack
COMMAND/CONTROL AND PATROL							
E-2C Hawkeye	NGC	USN	5	40	2xAll T56	6+ hr. mission duration	AEW command & control; active & passive detection
E-8A JSTARS	NGC	USAF/Army	21+	171	4xP&W JT3D	11-20+ hr. loiter	Ground surveillance/battle mgmt
RC-12 P/Q	Raytheon	Army	2	9	2xP&W PT6A	4 hr. loiter	Electronic intercept
CARGO-TRANSPORT							
C-12R	Raytheon	Army	2	8	2xP&W PT6A	268 mph; 788 n.m.	Utility/transport
C-17A Globemaster III	Boeing	USAF	3	267	4xP&W F117	Mach 0.77; 3,000 n.m.	102 troops or 172,000 lbs.
C-20F/G/H	Gulfstream	All	2	42-43	2xRR Tay	Mach 0.80; 4,200 n.m.	Versions of Gulfstream IV
C-32	Boeing	USAF	16	132	2xP&W 2040	Mach 0.80; 4,150 n.m.	Executive personnel transport
C-37A	Gulfstream	USAF	2	48	2xBR 710	Mach 0.80; 6,500 n.m.	Version of Gulfstream V
C/HC-130H Hercules	LM	USAF/USN	4	82/77	4xAll T56	320 mph; 3,280 mi.	64-92 troops or 39-41,000 lbs.
C-130J	LM	USAF	3	80	4xAll AE2100	390 mph; 3,850 mi.	
KC-130T	LM	USN	5-7	80	4xAll T56	9,900 gals.	Tanker
MC-130H Combat Talon II	LM	USAF	6	90	4xAll T56	340 mph; 3,250 mi.	Support requirements of SOF
V-22 Osprey	Bell/Boeing	USMC/SOF	3	33	2xAll T406	Max 316 mph; 2,100 n.m.	With internal fuel tanks, engines tilt for VTOL
TRAINING							
T-1A Jayhawk	Raytheon	USAF	2	10	2xP&W JT-15D	Max 538 mph	Tanker/transport trainer
T-6A Texan II	Raytheon	USN/USAF	2	5	1xP&W PT6A	Max 368 mph	Version of Beech MKII
T-45A Goshawk	Boeing/BAe	USN	2	9	1xRR F405	Mach 1.04 at 25,000 ft.	Next generation trainer
TH-67 Creek	Bell	Army	1	2	1xAll 250	Max 135 mph; 405 mi.	Rotary wing trainer
HELICOPTERS							
AH-1W Super Cobra	Bell	USMC	2	10	2xGE T700	Max 218 mph; 395 mi.	Marinized attack helicopter
AH-64 Apache	Boeing	Army	2	11	2xGE T700	Max 197 mph; 445 mi.	Attack helicopter
CH-53E	Sikorsky	USN	3-8	33-36	3xGE T64	Max 196 mph; 710 mi.	55 passengers, aux. tanks/ minesweeping
CH-60	Sikorsky	USN	4	11	2xGE T700	Max 184 mph; 373 mi.	Vertical replenish
HH-60H Seahawk	Sikorsky	USN	4-12	14	2xGE T700	Max 184 mph; 500 mi.	Combat search and rescue, SOF
MH-60G Pave Hawk	Sikorsky	USAF/Army	3	12	2xGE T700	Max 184 mph; 1,380 mi.	11 troops; combat; search; rescue
OH-58D Kiowa Warrior	Bell	Army	2	3	1xAll 250	Max 140 mph; 220 mi.	Armed attack/reconnaissance
RAH-66 Comanche	Boeing/Sikorsky	Army	2	9	2xLHTEC T800	Max 201 mph; 1,450 mi.	Armed recon./light attack
SH-2G Super Sea-Sprite	Kaman	USN	3-4	9	2xGE T700	Max 159 mph; 500 mi.	Multi-mission helicopter
UH-60L Black Hawk	Sikorsky	Army/USAF	3	11	2xGE T700	Max 184 mph; 373 mi.	UTTAS

Source: Aerospace Industries Association, based on company reports.

KEY: All = Allison Gas Turbine; BAe = British Aerospace; BR = BMW-Rolls Royce; GE = General Electric; LHTEC = Light Helicopter Turbine Engine Co.; LM = Lockheed Martin; NGC = Northrop Grumman; P&W = Pratt & Whitney; RR = Rolls Royce.

Missile Programs

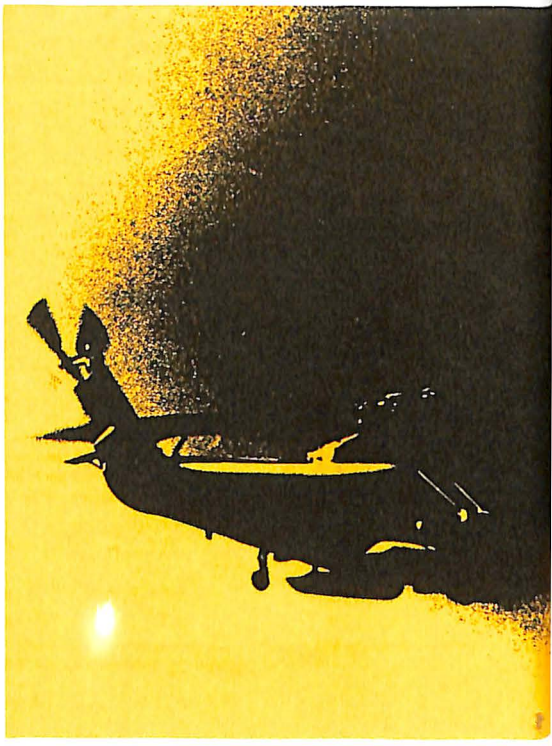
INDUSTRY SALES OF MISSILE systems hit a new low point in 1997, after a slight upturn in 1996, based on revised figures from the Bureau of the Census. Sales of missile systems and parts amounted to $4 billion, down from the revised $4.8 billion in the previous year (these figures exclude the value of separable propulsion units). In inflation-adjusted constant dollar terms, the 1997 figure represented a 68% drop from the 1987 peak year and the lowest sales level since the early 1950s.

Net new orders fell dramatically in 1997, to $4.3 billion from a revised figure of $8.7 billion in 1996. Despite the drop in new orders, the missile backlog, as of year-end 1997, still showed an increase. The unfilled order backlog rose to $6.9 billion (up from $6.6 billion) and marked the second year of growth after eight years of decline.

Based on a historical summary of DoD outlays during the 1990s, FY 1998 marked another year of decline and continued the trend of less emphasis on missile procurement. FY 1998 missile outlays totaled $4.5 billion, down from a revised FY 1997 figure of $5.2 billion. FY 1998's outlays represent a 69% drop from outlays of $14.9 billion in the peak year of FY 1990. Planned outlays for FY 1999 are $4.3 billion, with a breakdown of $2.3 billion to the Air Force, $1.1 billion to the Navy, and $0.9 billion to the Army.

Missile programs in production during 1997/98 and planned for procurement funding under FY 1999 appropriations include:

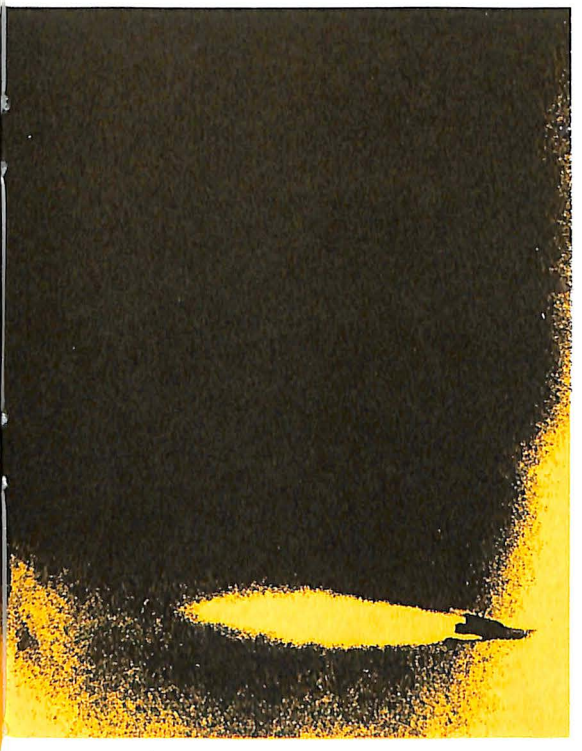
Air Force: AMRAAM, the USAF/Navy joint use Advanced Medium Range Air-to-Air Missile, $177 million; Sensor Fuzed Weapon (SFW), $126 million; Joint Direct Attack Munition (JDAM), a joint USAF/Navy program for enhanced



accuracy of air-launched munitions, $95 million; and the Wind-Corrected Munitions Dispenser (WCMD), $14 million.

Navy: Trident II Fleet Ballistic Missile, $324 million; Standard air defense missile, $226 million; Joint Standoff Weapon (JSOW), Navy-procured for both Navy/USAF use, $177 million; Tomahawk cruise missile, $130 million; the RAM (Rolling Airframe Missile), $45 million; and the Evolved Sea Sparrow Missile (ESSM), $36 million.

Army: Javelin advanced antitank weapon, a joint Army/Marine Corps program, $403 million; Hellfire helicopter-launched antiarmor missile, $361 million; ATACMS (Army Tactical Missile System), $140 million; BAT (Brilliant Antiarmor Submunition), $100 million; Sense and Destroy Armor System (SADARM), $57 million; Avenger mobile antiaircraft weapon system, $35 million; MLRS (Multiple Launch Rocket System), $16.5 million; and Enhanced Fiber Optic Guided Missile (EFOGM), $13.7 million.



BMDO: Patriot PAC-3 air defense system, $343 million and the Navy Area Theater system, $43 million.

The bulk of DoD missile RDT&E funding continues activities related to ballistic missile defense. RDT&E funded by the Ballistic Missile Defense Organization (BMDO) totaled $3.3 billion in FY 1998 and is estimated to be $3.2 billion in FY 1999. The largest program for FY 1999, in terms of funding, is National Missile Defense with planned funding of $951 million. The Air Force's missile program receiving the highest level of RDT&E funding in FY 1999 is the JASSM (Joint Air-to-Surface Missile) at $135 million; the Navy's is the AIM-9X Sidewinder, $119 million, and the Army's is the BAT (Brilliant Anti-armor Submunition), $83 million.

MISSILE PROGRAM PROCUREMENT

Fiscal Years 1997, 1998, and 1999
(Millions of Dollars[a])

Agency and Model	1997		1998 E		1999 E	
	No.	Cost	No.	Cost	No.	Cost
AIR FORCE						
AGM-130	72	$ 34.8	30	$ 24.4	—	$ 0.3
AMRAAM[b]	233	160.9	293	159.3	295	177.2
HAVE NAP	31	34.6	15	24.3	—	—
JDAM[b]	937	23.0	3,068	83.5	3,137	94.6
SFW	542	149.5	556	150.2	300	126.0
WCMD	—	—	280	12.0	701	13.9
NAVY						
ESSM	—	$ —	—	$ 10.3	28	$ 35.7
JSOW[b]	100	89.0	179	81.6	428	177.3
RAM	135	46.9	100	41.0	100	44.8
Standard	127	209.4	114	176.4	120	225.7
Tomahawk	155	102.2	65	50.0	114	129.8
Trident II	7	313.0	5	267.7	5	323.5
ARMY						
ATACMS	97	$135.3	100	$ 93.5	126	$139.7
Avenger	93	62.4	—	7.2	19	35.3
BAT	—	—	—	—	420	100.4
EPOGM	—	—	96	12.9	96	13.7
Hellfire	2,856	356.4	1,100	261.7	2,000	360.6
Javelin[c]	1,161	233.0	1,460	196.9	4,057	402.8
MLRS	1,500	45.3	528	19.3	522	16.5
SADARM	600	93.6	507	66.4	500	56.5
BMDO						
Patriot[d]	—	$219.0	48	$341.3	60	$343.3
Navy Area Theater[f]	—	9.1	—	15.1	21	43.3

Source: Department of Defense, "Program Acquisition Costs by Weapon System" (Annually).
NOTE: See Research and Development Chapter for missile program RDT&E authorization data.
a Total Obligational Authority excluding initial spares and RDT&E.
b Navy and Air Force funding.
c Army and Marine Corps funding.
d Army and BMDO funding.
E Estimate. Latest year reflects Administration's budget proposal.
f Navy and BMDO funding.
NA Not available.

DEPARTMENT OF DEFENSE
OUTLAYS FOR MISSILE PROCUREMENT

By Agency
Fiscal Years 1964–1999
(Millions of Dollars)

Year	TOTAL MISSILE PROCUREMENT	Air Force	Navy	Army
1964	$ 3,577	$2,100	$ 981	$ 496
1965	2,096	1,320	522	254
1966	2,069	1,313	512	244
1967	1,930	1,278	432	220
1968	2,219	1,388	436	395
1969	2,509	1,382	534	593
1970	2,912	1,467	702	743
1971	3,140	1,497	791	852
1972	3,009	1,334	831	844
1973	3,023	1,454	628	941
1974	2,981	1,537	541	903
1975	2,889	1,602	615	672
1976	2,296	1,549	584	163
Tr.Qtr.	402	347	148	(93)
1977	2,781	1,501	905	374
1978	3,096[a]	1,376	1,302[a]	418
1979	3,786	1,537	1,702	547
1980	4,434	1,810	1,973	651
1981	5,809	2,366	2,297	1,146
1982	6,782	3,069	2,444	1,269
1983	7,795	3,383	2,812	1,600
1984	9,527	4,640	2,809	2,079
1985	10,749	5,409	2,941	2,399
1986	11,731	6,473	2,780	2,478
1987	11,473	6,002	3,157	2,314
1988	11,676	6,046	3,392	2,239
1989	14,503	7,349	4,445	2,709
1990	14,851	7,951	4,446	2,453
1991	14,400	6,906	4,954	2,540
1992	13,504	6,409	4,694	2,401
1993	11,404	5,424	3,794	2,187
1994	8,934	4,312	3,238	1,384
1995	7,513	3,845	2,694	974
1996	6,199	3,235	2,045	919
1997	5,225	2,743	1,546	936
1998[E]	4,537	2,399	1,264	874
1999[E]	4,312	2,321	1,080	911

Source: Office of Management and Budget, "The Budget of the United States Government" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Beginning 1978, DoD combined Navy Missile Procurement with torpedoes and other related products into Navy Weapons Procurement. Missiles comprise approximately 80 percent of the value of this category.
E Estimate. Latest year reflects Administration's budget proposal.
Tr.Qtr. See Glossary.

MAJOR MISSILE PROGRAMS
RESEARCH, DEVELOPMENT, PRODUCTION

Program	Agency	Status	Systems Contractor	Propulsion Manufacturer	Guidance Manufacturer
AIR-TO-AIR					
AMRAAM-120B/C	USAF/USN	P	Raytheon	Alliant/ Aerojet	Raytheon
Sidewinder-9M	USN/USAF	P	NASC	ARC	Raytheon/LM
Sidewinder-9X	USN	D	Raytheon	Alliant	Raytheon/GEC
AIR-TO-SURFACE					
AGM-130A/B	USAF	P	Boeing	Alliant	GEC/Boeing
AGM-142	USAF	P	LM/Rafael	Rafael	Litton/GEC
AGM-86B/C	USAF	P	Boeing	WI	Litton/Boeing/ Interstate
GATS/GAM	USAF	P	NGC	—	Honeywell
GBU-15	USAF	P	Boeing	—	Boeing
HARM-88A/B	USN/USAF	P	Raytheon	TKC	Raytheon
*Harpoon-84A/C/D	USN	P	Boeing	TCAE/Aerojet	Ray/Kearfott/ IBM/LSI
JASSM	USN/USAF	D	LM	TCAE	HI/Litton
JDAM	USAF/USN	D	Boeing	—	HI/Boeing
JSOW-154	USN/USAF	D	Raytheon	—	Kearfott
Maverick-65D/G/H/K	USAF	P	Raytheon	Alliant	Raytheon
Maverick-65F	USN	P	Raytheon	Alliant	Raytheon
Maverick-65J	USN/USMC	D	Raytheon	Alliant	Raytheon
Paveway	USN/USAF	P	Raytheon	—	Raytheon/GEC
SLAM-84E	USN	P	Boeing	TCAE	Boeing/Ray/HI
WCMD	USAF	D	LM	—	LM/HI

* Also Surface-to-Surface

(Continued on next page)

MAJOR MISSILE PROGRAMS (Continued)

Program	Agency	Status	Systems Contractor	Propulsion Manufacturer	Guidance Manufacturer
ANTI-SUBMARINE					
VLA-44A	USN	P	LM	TKC	LM
SURFACE-TO-AIR					
Hawk-23B	Army	P	Raytheon	Aerojet	Raytheon
MEADS	Army	D	LM/Raytheon	—	Raytheon/LM
Patriot-104	Army	P	Raytheon	TKC	Raytheon
PAC-3	Army	D	LM	ARC	LM/HI/ Boeing
RAM-116A	USN	P	Raytheon	Alliant/ARC	Raytheon
RAM-116B	USN	D	Raytheon	TKC/Alliant	Raytheon
Sea Sparrow-7M	USN	P	Raytheon	Alliant	Raytheon
Sea Sparrow-Evolved	USN	D	Raytheon	Alliant/Raufoss	Raytheon/HI
SLID	Army	D	Boeing	ARC	Boeing
Standard 2 MR	USN	P	Raytheon	ARC	HI/Raytheon
Standard 2 ER	USN	P	Raytheon	ARC	HI/Raytheon
Standard 2-IV	USN	P	Raytheon	ARC/UTC	HI/Raytheon
Standard 2-IVA	USN	D	Raytheon	ARC/UTC/TKC	HI/Raytheon
Stinger-92D/E	All	P	Raytheon	ARC	Raytheon
THAAD	Army	D	LM	UTC/Boeing	—

(Continued on next page)

MAJOR MISSILE PROGRAMS (Continued)

Program	Agency	Status	Systems Contractor	Propulsion Manufacturer	Guidance Manufacturer
SURFACE-TO-SURFACE					
*Harpoon-84A/C/D	USN	P	Boeing	TCAE/TKC	Ray/IBM/LSI/ NGC/Kearfott
Tomahawk (SLCM)	USN	P	Raytheon	WI/UTC/ARC	Ray/Litton
Tomahawk-Tactical	USN	D	Raytheon	TCAE/ARC	Raytheon
Trident 2 (D-5)	USN	P	LM	Alliant/TKC/ UTC/ARC	LM/Draper/ Ray/Boeing/ Kearfott
BATTLEFIELD SUPPORT AND ANTIARMOR					
ATACMS	Army	P	LM	ARC	Honeywell
Dragon-47	Army	P	Boeing	Boeing	Boeing
GLMRS	Army	D	LM	—	Litton
HELLFIRE-114A/C/F	Army/USMC	P	Boeing/LM	Alliant/TKC	LM/Boeing
HELLFIRE II-114K	Army/USMC	P	LM/Boeing	Alliant/TKC	LM/Boeing
Longbow HELLFIRE 114L	Army/USMC	P	LM/NGC	Alliant	LM/NGC/GEC
LOSAT	Army	D	LM	Alliant	ARC/Ray
Javelin	Army/USMC	P	Ray/LM	ARC	LM/Ray/GEC
MLRS-26,-270	Army	P	LM	ARC	—
MPIM/SRAW	Army	D	LM	Alliant	LM
Predator	USMC	D	LM	Alliant	LM
SMAW	USMC	P	Boeing	Boeing	—
TOW2A-71E	Army	P	Raytheon	Alliant/TKC	Emerson El./Ray
TOW2B-71F	Army	P	Raytheon	Alliant	Emerson El./Ray

Source: Aerospace Industries Association, based on company reports.
Status: R-Research; D-Development; P-Production.
* Also Air-to-Surface
Abb: ARC — Atlantic Research; GEC — General Electric Co PLC; HI — Honeywell; LSI — Lear Siegler; LM — Lockheed Martin; NAC — Naval Avionics Center; NASC — Naval Air Systems Command; NGC — Northrop Grumman; Ray — Raytheon; TCAE — Teledyne Ryan Aeronautical; TKC — Thiokol; UTC — United Technologies; WI — Williams International

ORDERS, SALES, AND BACKLOG
MISSILE SYSTEMS AND PARTS[a]

Calendar Years 1983–1997
(Millions of Dollars)

Year	SALES—Current Dollars	SALES—Constant Dollars[b]
1983	$ 5,991	$ 6,498
1984	6,094	6,106
1985	7,975	8,080
1986	8,236	8,253
1987	9,671	9,671
1988	9,485	9,308
1989	9,283	8,749
1990	9,102	8,237
1991	8,989	7,844
1992	9,032	7,641
1993	7,713	6,364
1994	5,294	4,276[r]
1995	4,688	3,730[r]
1996[r]	4,792	3,761
1997	4,001	3,078

Year	NET NEW ORDERS	BACKLOG AS OF DECEMBER 31
1983	$ 7,231	$ 8,406
1984	7,731	10,043
1985	8,122	10,190
1986	11,023	12,754
1987	11,482	14,302
1988	9,437	14,255
1989	8,998	14,005
1990	7,917	12,956
1991	8,072	12,571
1992	9,234	11,814
1993	4,775	9,305
1994	2,785	5,823
1995	3,164	4,833
1996[r]	8,672	6,563
1997	4,297	6,902

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)" Series MA37D (Annually).
a Excludes engines and propulsion units where separable.
b Based on AIA's aerospace composite price deflator, 1987=100.
r Revised.

BALLISTIC MISSILE DEFENSE ORGANIZATION
FUNDING BY PROJECT NUMBER

Fiscal Years 1995–1999
(Millions of Dollars)

Project Number and Title		1995[r]	1996[r]	1997	1998[E]	1999[E]
1151	Sensors	$112	$192	$ —	$ —	$ —
1155	Discrimination	78	58	68	77	56
1161	Advanced Sensor Technology	13	19	35	36	13
1170	TMD Risk Reduction	24	42	23	26	19
1262	Mead Concepts	—	20	59	46	43
1264	Atmospheric Interceptor	—	—	—	33	25
1265	Boost Phase Interceptor	41	—	—	—	—
1266	Navy Theater Wide Defense	75	200	304	419	190
1267	Ground-Based Interceptor	137	287	—	—	—
1270	Advanced Interceptors	15	36	70	35	33
1294	BPI/TMD Concept Development	—	6	24	16	—
1360	Directed Energy Programs	40	76	94	122	59
1460	BM/C3 Technologies	27	81	—	—	—
1651	Innovative Science & Technology	44	47	59	65	24
1660	Statutory & Mandated Programs	40	53	68	53	63
2154	TMD Ground-Based Radar	170	—	—	—	—
2160	TMD Existing System Modifications	16	20	16	5	3
2257	PATRIOT	596	662	602	540	481
2259	ACES/ADP	42	59	42	51	38
2260	THAAD	479	520	616	391	822
2262	Corps SAM	14	—	—	—	—
2263	Navy Area TBMD	154	298	309	294	289

(Continued on next page)

BALLISTIC MISSILE DEFENSE ORGANIZATION FUNDING BY PROJECT NUMBER (Continued)

Fiscal Years 1995–1999
(Millions of Dollars)

Project Number and Title		1995[r]	1996[r]	1997	1998[E]	1999[E]
2358	HAWK System BM/C3	$ 31	$ 37	$ 15	$ —	$ —
2401	NMD Integration	—	—	24	143	343
2402	Sensor Technology	—	—	54	19	20
2403	Ground-Based Interceptor	—	—	272	300	228
2404	BM/C3 Ground-Based Radar	—	—	51	62	50
2405	Ground-Based Radar	—	—	66	56	49
2406	UEWR	—	—	12	16	—
2407	Systems Engineering	—	—	47	43	30
2408	Deployment Planning	—	—	12	19	30
2409	Program Support	—	—	28	61	45
2410	Test & Evaluation	—	—	103	142	141
2411	Risk Reduction	—	—	17	—	—
3152	NMD System Engineering	21	55	—	—	—
3153	Systems Architecture & Engineering	11	13	11	12	17
3155	TAMD Integration	—	—	—	10	26
3157	Environment, Siting, & Facilities	4	10	6	5	3
3160	Deployment Planning	13	23	2	—	—
3251	System Engineering & Technical Support	50	44	46	53	39
3261	TMD BM/C3I	20	65	48	55	55
3265	Joint TMD Warfighter Support	20	18	16	16	18
3270	Threat & Countermeasures	29	28	28	25	22
3352	Modeling & Simulations	89	87	104	66	56
3353	Joint National Test Facility	—	—	—	53	54
3354	Targets Support	66	23	22	53	23
3359	System Test & Evaluation	41	63	39	36	26
3360	Test Resources	43	42	49	72	45
4000	Management	157	157	143	134	131
	Other programs[a]	—	—	18	—	—
	TOTAL DETAILED PROJECTS	$2,713	$3,343	$3,622	$3,660	$3,605

Source: Ballistic Missile Defense Organization.
a Projects with five year funding under $20 million herein combined.
E Estimate. Represents Administration's budget request.
r Revised.

Space

ACCORDING TO THE BUREAU OF the Census, sales of space systems continued their steady climb that began in 1994. Space system sales in 1997 reached $13.4 billion, a 14.6% gain from 1996 and a new all-time high.

The $13.4 billion in sales includes space launch vehicles, government-sponsored civil and military spacecraft hardware fabrication, and related ground equipment, but does not include propulsion systems. The total breaks down into $8.5 billion in civil work (commercial plus government-sponsored civil space) and $4.9 billion in military sales. Civil sales showed a sharp increase of $2.4 billion, while military sales dropped by $700 million from 1996 levels.

New orders, after spiking in 1996 at $16.5 billion, dipped to $13.8 billion in 1997 back to 1994-1995 levels. New civil orders, fueled in part by increased spending on the International Space Station and a continuing strong market for commercial space systems, rose after a dip in 1996 to a record-high level.

The new orders included $9.2 billion in civil orders, twice the level of the $4.6 billion in military orders. The backlog for space systems rose slightly to $23.4 billion from the previous all-time high of $23 billion in 1996. The 1997 backlog included $14.6 billion in civil orders and $8.8 billion in military orders.

Sales, orders, and backlog for propulsion units, which are reported separately by Census, only provide a loose approximation of trends in the space market because they combine missile system propulsion units with space propulsion. Total sales in this category were $2.7 billion, up from the $2 billion reported in 1996. The increase reflects a jump in the market for civil propulsion systems, which rose from $1.4 billion to $2.1 billion, a gain of 54%. Military sales, which mainly reflect the missile propulsion market, were down from $635 million in 1996 to $560 million in 1997.

Net new orders for propulsion systems mirrored the trend in propulsion sales. Orders rose from $1.9 billion in 1996 to $2.4 billion in 1997. Similarly, civil orders rose substantially, from $1.1 billion in 1996 to $1.9 billion in 1997, while military orders declined from $745 million in 1996 to $475 million in 1997. The backlog, however, fell in both the military and civil sectors, with the civil backlog declining from $4.8 billion to $4.5 billion and the military backlog falling from $1.1 billion to $1 billion.

Total federal government funding for space activiti in FY 1997 climbed by nearly $1 billion. NASA

outlays again topped Department of Defense outlays, continuing a trend that began in 1994. In 1997, NASA outlays were expected to reach $13 billion versus DoD's expected $12 billion. NASA outlays rose from $12.7 billion, while DoD outlays rose from $11.4 billion.

Overall, estimated spending by NASA and DoD accounted for nearly 98% of all government space-related outlays for FY 1997. The other agencies projected spending on space included: the Department of Commerce, with $336 million (down from $354 million); the Department of Energy, with $37 million (down from $46 million); and the National Science Foundation, the Environmental Protection Agency, and the Departments of Interior, Agriculture, and Transportation, which together were projected to spend $239 million (up from $228 million).

AIA estimates sales for the entire space sector, which includes the R&D and other space-related services carried out by industry firms under government contract, reached $32 billion, compared with $29 billion in 1996.

ORDERS, SALES, AND BACKLOG
SPACE VEHICLE SYSTEMS[a]

Calendar Years 1983–1997
(Millions of Dollars)

Year	SALES—Current Dollars			SALES—Constant Dollars[b]		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1983	$. 4,940	$2,420	$2,520	$ 5,358	$2,625	$ 2,733
1984	5,225	3,019	2,206	5,235	3,025	2,210
1985	6,300	4,241	2,059	6,383	4,297	2,086
1986	6,304	4,579	1,725	6,317	4,588	1,728
1987	8,051	5,248	2,803	8,051	5,248	2,803
1988	8,622	6,190	2,432	8,461	6,075	2,387
1989	9,758	6,457	3,301	9,197	6,086	3,111
1990	9,691	6,556	3,135	8,770	5,933	2,837
1991	10,515	6,770	3,745	9,175	5,908	3,268
1992	9,266	5,887	3,379	7,839	4,981	2,859
1993	7,317	4,175	3,142	6,037	3,445	2,592
1994	10,594	5,707	4,887	8,557[r]	4,610[r]	3,947[r]
1995	11,314	4,782	6,532	9,001[r]	3,804[r]	5,196[r]
1996[r]	11,698	5,613	6,085	9,182	4,406	4,776
1997	13,410	4,916	8,494	10,315	3,782	6,534

Year	NET NEW ORDERS			BACKLOG AS OF DECEMBER 31		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1983	$ 5,399	$3,016	$2,383	$ 4,865	$2,733	$ 2,132
1984	4,984	3,385	1,599	4,624	3,099	1,525
1985	8,383	6,083	2,300	6,707	4,941	1,766
1986	7,437	5,666	1,771	8,063	6,028	2,035
1987	11,455	9,000	2,455	12,393	9,460	2,933
1988	7,296	4,561	2,735	10,838	7,880	2,958
1989	11,709	8,107	3,602	13,356	9,192	4,164
1990	9,598	6,256	3,342	12,462	8,130	4,332
1991	11,222	5,468	5,754	11,664	6,221	5,443
1992	10,491	6,773	3,718	12,809	7,622	5,187
1993	8,436	5,106	3,330	13,663	7,384	6,279
1994	9,041	4,896	4,145	12,888	6,732	6,156
1995	13,212	4,679	8,533	15,650	5,872	9,778
1996[r]	16,527	8,888	7,639	23,004	9,125	13,879
1997	13,760	4,580	9,180	23,357	8,790	14,567

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)" Series MA37D (Annually).
a Excludes engines and propulsion units where separable.
b Based on AIA's aerospace composite price deflator, 1987=100.
r Revised.

ORDERS, SALES, AND BACKLOG ENGINES AND PROPULSION UNITS FOR MISSILES AND SPACE VEHICLES

Calendar Years 1983–1997
(Millions of Dollars)

Year	SALES—Current Dollars			SALES—Constant Dollars[a]		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1983	$1,814	$ 951	$ 863	$1,967	$1,031	$ 936
1984	2,305	1,116	1,189	2,310	1,118	1,191
1985	2,466	1,256	1,210	2,498	1,273	1,226
1986	2,995	1,796	1,199	3,001	1,800	1,201
1987	2,993	1,563	1,430	2,993	1,563	1,430
1988	3,407	1,830	1,577	3,343	1,796	1,548
1989	3,602	1,771	1,831	3,395	1,669	1,726
1990	3,247	1,911	1,336	2,938	1,729	1,209
1991	3,807	1,869	1,938	3,322	1,631	1,691
1992	3,051	1,577	1,474	2,581	1,334	1,247
1993	3,104	1,619	1,485	2,561	1,336	1,225
1994	2,518	1,123	1,395	2,034[r]	907[r]	1,127[r]
1995	2,364	1,035	1,329	1,881[r]	823[r]	1,057[r]
1996[r]	2,016	635	1,381	1,582	498	1,084
1997	2,688	560	2,128	2,068	431	1,637

Year	NET NEW ORDERS			BACKLOG AS OF DECEMBER 31		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1983	$1,618	$ 942	$ 676	$1,691	$1,052	$ 639
1984	3,770	2,258	1,512	3,156	2,194	962
1985	3,823	1,323	2,500	4,513	2,261	2,252
1986	1,985	1,224	761	3,503	1,689	1,814
1987	3,335	1,995	1,340	3,849	2,121	1,728
1988	3,507	1,623	1,884	3,985	1,998	1,987
1989	6,113	2,475	3,638	6,410	2,595	3,815
1990	2,692	1,891	801	6,230	2,887	3,343
1991	5,661	1,087	4,574	8,422	2,327	6,095
1992	3,124	2,097	1,027	8,310	2,729	5,581
1993	1,708	710	998	6,543	1,903	4,640
1994	1,879	484	1,395	6,035	1,390	4,645
1995	2,805	444	2,361	6,630	1,065	5,565
1996[r]	1,868	745	1,123	5,873	1,108	4,765
1997	2,361	475	1,886	5,546	1,023	4,523

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)" Series MA37D (Annually).
a Based on AIA's aerospace composite price deflator, 1987=100.
r Revised.

U.S. GOVERNMENT SPACECRAFT RECORD[a]

Calendar Years 1957–1997

Year	Earth Orbit[b]		Earth Escape[b]		Year	Earth Orbit[b]		Earth Escape[b]	
	Success	Failure	Success	Failure		Success	Failure	Success	Failure
1957	—	1	—	—	1978	34	2	7	—
1958	5	8	—	4	1979	18	—	—	—
1959	9	9	1	2	1980	16	4	—	—
1960	16	12	1	2	1981	20	1	—	—
1961	35	12	—	2	1982	21	—	—	—
1962	55	12	4	1	1983	31	—	—	—
1963	62	11	—	—	1984	35	3	—	—
1964	69	8	4	—	1985	37	1	—	—
1965	93	7	4	1	1986	11	4	—	—
1966	94	12	7	1[c]	1987	9	1	—	—
1967	78	4	10	—	1988	16	1	—	—
1968	61	15	3	—	1989	24	—	2	—
1969	58	1	8	1	1990	40	—	1	—
1970	36	1	3	—	1991	32[d]	—	—	—
1971	45	2	8	1	1992	26[d]	—	1	—
1972	33	2	8	—	1993	28[d]	1	1	—
1973	23	2	3	—	1994	31[d]	1	1	—
1974	27	2	1	—	1995	24[d]	2	1	—
1975	30	4	4	—	1996	30[d]	1	3	—
1976	33	—	1	—	1997[f]	15	—	—	—
1977	27	2	2	—					
					TOTAL	1,387	149	89	15

Source: NASA, "Aeronautics and Space Report of the President" (Annually).

a Payloads, rather than launchings; some launches account for multiple spacecraft. Includes spacecraft from cooperating countries launched on U.S. launch vehicles.

b The criterion of success is attainment of Earth orbit or Earth escape rather than judgement of mission success. "Escape" flights include all that were intended to go at least an altitude equal to the lunar distance from the Earth.

c This Earth-escape failure did attain Earth orbit and therefore is included in the Earth-orbit success totals.

d Excludes commercial satellites.

f Through September 30.

WORLDWIDE SPACE LAUNCHINGS[a] WHICH ATTAINED EARTH ORBIT OR BEYOND

Calendar Years 1957–1997

Country	Total 1957–1997	1993	1994	1995	1996[r]	1997[c]
TOTAL	3,874	78	90	76	72	56
U.S.S.R.	2,543	45	49	33	25	18
United States	1,108	24	26	27	32	25
European Space Agency	93	7	6	12	10	7
Japan	51	1	2	1	1	1
People's Republic of China	46	1	5	2	3	4
India	10	—	2	—	1	1
Israel	3	—	—	1	—	—
Other[b]	20	—	—	—	—	—

Source: NASA, "Aeronautics and Space Report of the President" (Annually).
a Number of launchings rather than spacecraft; some launches orbited multiple spacecraft.
b Includes 10 by France, 8 by Italy (5 were U.S. spacecraft), 1 by Australia, and 1 by the United Kingdom.
c Through September 30.
r Revised.

U.S. SPACE LAUNCH VEHICLES

As of 1997

Vehicle and Initial Launch & First Launch of this Modification	Stages	Thrust (Kilo-newtons)	Maximum Payload (Kg)[a]		
			185-Km Orbit	Geo-synch.-Transfer Orbit	Circular Sun-Synch. Orbit
Pegasus (1990)	1. Orion 50S* 2. Orion 50* 3. Orion 38*	484.9 118.2 31.9	380 280[b]	—	210
Pegasus XL (1994)[c]	1. Orion 50S-XL* 2. Orion 50-XL* 3. Orion 38*	743.3 201.5 31.9	460 350[b]	—	335
Taurus (1994)	0. Castor 120* 1. Orion 50S* 2. Orion 50* 3. Orion 38*	1,687.7 580.5 138.6 31.9	1,400 1,080[b]	255	1,020
Delta II 7900 Series (1960; 1990)	1. RS-270/A plus 9 Hercules GEM* 2. AJ10-118K 3. Star 48B*	1,043.0 4,388.4 42.4 66.4	5,089 3,890[b]	1,842[d]	3,175
Atlas E (1958; 1968)	1. Atlas MA-3	1,739.5	820[b] 1,860[bf]	—	910[f]
Atlas I (1966; 1990)	1. Atlas MA-5 2. 2 Centaur I	1,952.0 146.8	—	2,255	—
Atlas II (1966; 1991)	1. Atlas MA-5A 2. 2 Centaur II	2,110.0 146.8	6,580 5,510[b]	2,810	4,300
Atlas IIA (1966; 1992)	1. Atlas MA-5A 2. 2 Centaur II	2,110.0 185.1	6,828 6,170[b]	3,062	4,750
Atlas IIAS (1966; 1993)	1. Atlas MA-5A plus 4 Castor IV* 2. 2 Centaur II	2,110.0 1,734.4 185.1	8,640 7,300[b]	3,606	5,800

(Continued on next page)

U.S. SPACE LAUNCH VEHICLES

As of 1997 (Continued)

Vehicle and Initial Launch & First Launch of this Modification	Stages	Thrust (Kilo-newtons)	Maximum Payload (Kg)[a]		
			185-Km Orbit	24-Hour Polar Orbit	Circular Sun-Synch. Orbit
Titan II (1964; 1988)	1. 2 LR-87 2. LR-91	2,090.0 440.0	1,905[b]	—	—
Titan III (1964; 1989)	0. 2 5 1/2-segment, 3.05-m. dia* 1. 2 LR-87 2. LR-91	12,420.0 2,429.0 462.8	14,515	5,000[g]	—
Titan IV (1989)	0. 2 7-segment, 3.05-m. dia* 1. 2 LR-87 2. LR-91	14,000.0 2,429.0 462.8	17,700 14,110[b]	6,350[g]	—
Titan IV/Centaur (1994)	0. 2 7-segment, 4.3-m. dia* 1. 2 LR-87 2. LR-91 3. Centaur 4. SRMU	14,000.0 2,429.0 462.5 73.4 7,690.0	—	5,760	—
Space Shuttle (reusable) (1981)	0. 3 main engines (SSMEs) fire in parallel with solid-fueled rocket boosters (SRBs) 1. 2 SRBs mounted on external tank (ET) fire in parallel with SSMEs 2. 2 OMS	5,006.1 23,580.0 53.4	24,900[h]	5,900[i]	—

Source: NASA, "Aeronautics and Space Report of the President" (Annually) and NASA Historian's office.

* Solid propellant; all others are liquid.

a Due east launch except as indicated.

b Polar launch.

c First launch was a failure.

d With Star 48B.

f With TE-M-364-4 upper stage.

g With appropriate upper stage.

h In full performance configuration (280–420 km orbit).

i With IUS or TOS.

FEDERAL SPACE ACTIVITIES OUTLAYS

Fiscal Years 1961–1997
(Millions of Current Dollars)

Year	TOTAL	NASA[a]	DoD	Energy	Commerce	Other[b]
1961	$ 1,468	$ 694	$ 710	$ 64	$ —	$ —
1962	2,387	1,226	1,029	130	1	1
1963	4,079	2,517	1,368	181	12	1
1964	5,930	4,131	1,564	220	12	3
1965	6,886	5,035	1,592	232	24	3
1966	7,719	5,858	1,637	188	28	7
1967	7,237	5,337	1,673	184	39	5
1968	6,667	4,595	1,890	147	29	6
1969	6,326	4,078	2,095	118	31	5
1970	5,453	3,565	1,756	103	24	5
1971	4,999	3,171	1,693	97	30	8
1972	4,772	3,195	1,470	60	37	10
1973	4,719	3,069	1,557	51	29	13
1974	4,854	2,960	1,777	39	64	14
1975	4,891	2,951	1,831	34	64	11
1976	5,314	3,336	1,864	26	71	16
Tr.Qtr.	1,361	869	458	8	23	4
1977	5,559	3,600	1,833	22	87	18
1978	6,188	3,582	2,457	29	101	20
1979	6,808	3,744	2,892	55	97	21
1980	7,734	4,340	3,162	49	89	94
1981	9,238	4,877	4,131	47	81	102
1982	10,542	5,463	4,772	60	142	106
1983	12,668	6,101	6,247	40	178	103
1984	14,813	6,461	8,000	33	209	109
1985	17,353	6,607	10,441	34	155	115
1986	18,683	6,756	11,449	35	317	127
1987	21,948	7,254	14,264	37	262	130
1988	23,521	8,451	14,397	199	334	140
1989	25,255	10,195	14,504	97	306	153
1990	25,788	12,292	12,962	79	279	177
1991	28,484	13,351	14,432	251	266	184
1992	27,998	12,838	14,437	223	298	202
1993	27,537	13,092	13,779	165	295	206
1994	23,929	12,363	10,973	83	297	213
1995	24,700[r]	12,593	11,494	70	330	213[r]
1996	24,675	12,694	11,353	46	354	228
1997[E]	25,626	13,055	11,959	37	336	239

Source: NASA, "Aeronautics and Space Report of the President" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Excludes amounts for air transportation.
b Departments of Interior, Transportation, and Agriculture, the National Science Foundation, and the Environmental Protection Agency.
E Estimated.
r Revised.
Tr.Qtr. See Glossary.

FEDERAL SPACE ACTIVITIES BUDGET AUTHORITY

Fiscal Years 1961–1997
(Millions of Dollars)

Year	TOTAL	NASA[a]	DoD	Energy	Commerce	Other[b]
1961	$ 1,809	$ 926	$ 814	$ 68	$ —	$ 1
1962	3,295	1,797	1,298	148	51	1
1963	5,435	3,626	1,550	214	43	2
1964	6,831	5,016	1,599	210	3	3
1965	6,956	5,138	1,574	229	12	3
1966	6,971	5,065	1,689	187	27	3
1967	6,710	4,830	1,664	184	29	3
1968	6,529	4,430	1,922	145	28	4
1969	5,976	3,822	2,013	118	20	3
1970	5,340	3,547	1,678	103	8	4
1971	4,740	3,101	1,512	95	27	5
1972	4,575	3,071	1,407	55	31	11
1973	4,825	3,093	1,623	54	40	15
1974	4,641	2,759	1,766	42	60	14
1975	4,913	2,915	1,892	30	64	12
1976	5,319	3,225	1,983	23	72	16
Tr.Qtr.	1,341	849	460	5	22	5
1977	5,983	3,440	2,412	22	91	18
1978	6,518	3,623	2,738	34	103	20
1979	7,243	4,030	3,036	59	98	20
1980	8,761	4,680	3,848	40	93	100
1981	10,053	4,992	4,828	41	87	105
1982	12,518	5,528	6,679	61	145	105
1983	15,672	6,328	9,019	39	178	108
1984	17,445	6,858	10,195	34	236	122
1985	20,273	6,925	12,768	34	423	123
1986	21,764	7,165	14,126	35	309	129
1987	26,558	9,809	16,287	48	278	136
1988	26,738	8,322	17,679	241	352	144
1989	28,563	10,097	17,906	97	301	162
1990	27,588	11,460	15,616	79	243	190
1991	27,924	13,046	14,181	251	251	195
1992	28,991	13,199	15,023	223	327	219
1993	27,868	13,064	14,106	165	324	209
1994	26,789	13,022	13,166	74	312	215
1995	23,816	12,543	10,644	60	352	217
1996	24,833	12,569	11,514	46	472	232
1997[E]	24,911	12,457	11,727	35	448	244

Source: NASA, "Aeronautics and Space Report of the President" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Excludes amounts for air transportation.
b Departments of Interior, Transportation, and Agriculture, the National Science Foundation, and the Environmental Protection Agency.
E Estimated.
Tr.Qtr. See Glossary.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION OUTLAYS

Fiscal Years 1975–1999
(Millions of Current Dollars)

Year	TOTAL	Research and Development	Space Flight Control and Data Communications[a]	Construction of Facilities	Research & Program Management[b]
1975	$ 3,267	$2,420	$ —	$ 85	$ 761
1976	3,669	2,749	—	121	799
Tr.Qtr.	951	731	—	26	195
1977	3,945	2,980	—	105	860
1978	3,983	2,989	—	124	870
1979	4,197	3,139	—	133	925
1980	4,852	3,701	—	140	1,010
1981	5,421	4,223	—	147	1,051
1982	6,035	4,796	—	109	1,130
1983	6,664	5,316	—	108	1,240
1984	7,048	2,792[a]	2,915	109	1,232
1985	7,318	2,118	3,707	170	1,323
1986	7,404	2,615	3,267	189	1,332
1987	7,591	2,436	3,597	149	1,409
1988	9,092	2,916	4,362	166	1,648
1989	11,052	3,922	5,030	190	1,909
1990	12,429	5,094	5,117	218	2,000
1991	13,878	5,765	5,590	326	2,196
1992	13,961	6,579	5,118	463	1,802
1993	14,305[r]	7,086	5,025	557	1,638
1994	13,695	6,758	4,899	371	1,666
1995[c]	5,098	3,286	1,409	305	98
1996[c]	1,022	510	241	265	6
1997[c]	317	101	92	122	2
1998[cE]	230	104	56	70	—
1999[cE]	52	—	—	52	—

Year	TOTAL	Science, Aeronautics, & Technology	Human Space Flight	Other[b]	Mission Support
1995[c]	$ 8,280	$2,708	$3,528	$ 15	$2,029
1996[c]	12,858	5,017	5,452	16	2,373
1997[c]	14,043	5,891	5,656	19	2,477
1998[cE]	13,499	5,590	5,576	19	2,314
1999[cE]	13,451	5,655	5,474	20	2,302

Source: Office of Management and Budget, "Budget of the United States Government" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Separate budget category beginning in 1984; funds formerly included under Research and Development.
b Includes trust funds, Office of Inspector General, & GSA building delegation.
c 1995 featured major budget account restructuring. Note: 1995–1999 outlays split between old and new account structure.
E Estimate. Latest year reflects Administration's budget proposal.
Tr.Qtr. See Glossary.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
BUDGET AUTHORITY

Fiscal Years 1968–1999
(Millions of Current Dollars)

Year	TOTAL	Research and Development	Space Flight Control and Data Communications[a]	Construction of Facilities	Research & Program Management[b]
1968	$ 4,589	$3,912	$ —	$ 38	$ 639
1969	3,995	3,314	—	33	648
1970	3,749	2,993	—	53	703
1971	3,312	2,556	—	26	730
1972	3,308	2,523	—	53	732
1973	3,408	2,599	—	79	730
1974	3,040	2,194	—	101	745
1975	3,231	2,323	—	143	765
1976	3,552	2,678	—	82	792
Tr.Qtr.	932	700	—	11	221
1977	3,819	2,856	—	118	845
1978	4,064	3,012	—	162	890
1979	4,559	3,477	—	148	934
1980	5,243	4,088	—	159	996
1981	5,522	4,334	—	117	1,071
1982	6,020	4,772	—	114	1,134
1983	6,875	5,539	—	139	1,197
1984	7,316	2,064[a]	3,772	223	1,256
1985	7,573	2,468	3,594	178	1,332
1986	7,807	2,619	3,670	176	1,342
1987	10,923	3,154	6,100	217	1,453
1988	9,062	3,280	3,806	213	1,763
1989	10,969	4,213	4,555	275	1,927
1990	12,324	5,225	4,645	218	2,023
1991	14,016	6,024	5,271	498	2,212
1992	14,317	6,848	5,352	525	1,576
1993	14,310	7,074	5,059	526	1,652
1994	14,570	7,534	4,835	493	1,708

Year	TOTAL	Science, Aeronautics, & Technology	Human Space Flight	Other[b]	Mission Support
1995[c]	$13,854	$5,936	$5,515	$(130)	$2,533
1996	13,886	5,929	5,457	17	2,483
1997	13,711	5,590	5,540	19	2,562
1998[E]	13,639	5,680	5,507	19	2,433
1999[E]	13,466	5,457	5,511	21	2,477

Source: Office of Management and Budget, "Budget of the United States Government" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Separate budget category beginning in 1984; funds formerly included under Research and Development.
b Includes trust funds, Office of the Inspector General, & GSA building delegation.
c 1995 features major budget account restructuring.
E Estimate. Latest year reflects Administration's budget proposal.
Tr.Qtr. See Glossary.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION BUDGET AUTHORITY BY MAJOR BUDGET ACCOUNT FOR SELECTED PROGRAMS

Fiscal Years 1998–1999
(Millions of Dollars)

	1998[E]	1999[E]
HUMAN SPACE FLIGHT	$5,680	$5,511
Space Station	$2,501	$2,270
U.S.-Russian Cooperative Space Activities	50	—
Space Shuttle—**Total**	2,923	3,059
Shuttle Operations	2,369	2,487
Safety/Performance Upgrades	553	572
Payload & Utilization Operations	205	182
SCIENCE, AERONAUTICS, & TECHNOLOGY	$5,552	$5,457
Space Science	$1,984	$2,058
Life & Microgravity Sciences & Applications	214	242
Earth Science	1,367	1,372
Aeronautics & Space Transportation Technology	1,471	1,305
Mission Communication Services	396	380
Academic Programs	120	100
MISSION SUPPORT	$2,388	$2,477
Safety, Mission Assurance, Engineering & Advanced Concepts	$ 38	$ 36
Space Communication Services	194	177
Research & Program Management	2,034	2,099
Construction of Facilities	122	165
INSPECTOR GENERAL	$ 18	$ 20

Source: "NASA Budget Briefing Background Material" (Annually).
Note: Detail may not add to totals because of rounding.
E Estimate. Latest year reflects Administration's budget proposal.

DEPARTMENT OF DEFENSE SPACE PROGRAMS
PROCUREMENT (INCLUDING INITIAL SPARES) AND RDT&E

Fiscal Years 1997, 1998, and 1999
(Millions of Dollars[a])

Agency and Program	1997		1998 E		1999 E	
	Procurement	RDT&E	Procurement	RDT&E	Procurement	RDT&E
AIR FORCE						
Defense Support Program	$ 60.4	$ 24.7	$104.8	$ 20.7	$ 89.9	$ 15.3
EELV	—	44.3	—	87.0	—	283.6
Medium Launch Vehicles	154.7	11.0	201.8	5.1	188.4	7.4
Milstar	—	659.7	—	628.0	—	550.9
NAVSTAR GPS	197.0	77.3	157.6	92.0	174.8	83.8
SBIRS-Low	—	252.5	—	202.4	—	193.6
SBIRS-High	—	193.0	—	316.5	—	538.4
Titan Launch Vehicles	317.9	77.7	450.9	70.5	578.5	87.4
ARMY						
DSCS	$ 96.6	$ 15.8	$ 93.0	$ 14.3	$110.6	$ 16.2

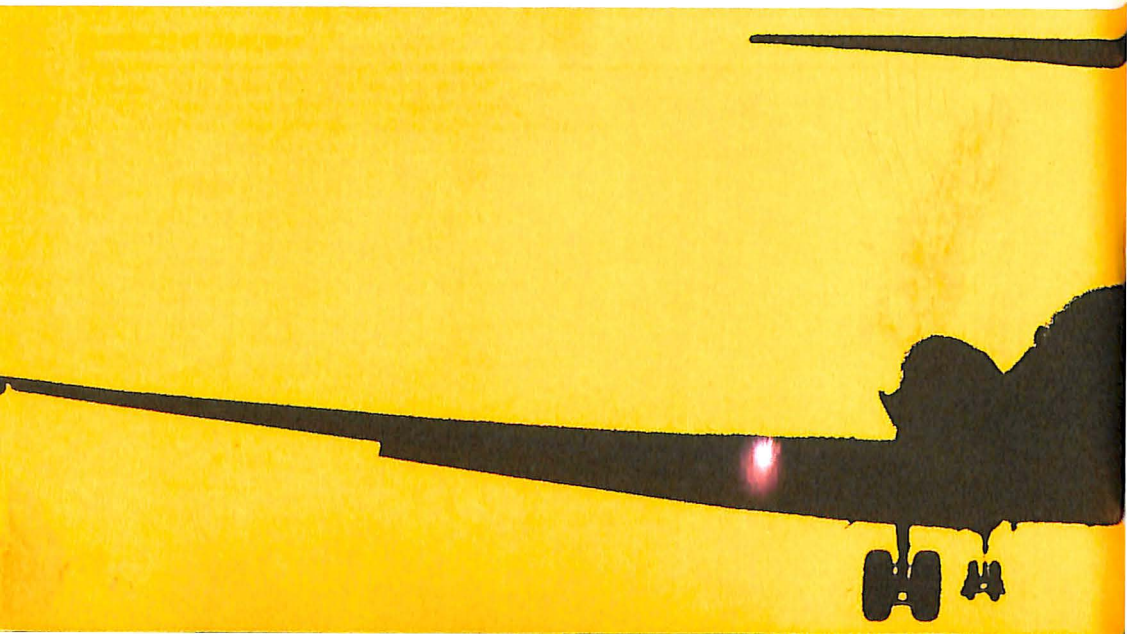
Source: Department of Defense, "Program Acquisition Costs by Weapon System" (Annually).
a Total Obligational Authority.
E Estimate. Latest year reflects Administration's budget proposal.
NA Not available.
KEY: DSCS = Defense Satellite Communications System
EELV = Evolved Expendable Launch Vehicle
GPS = Global Positioning System
SBIRS = Space-Based InfraRed System

Air Transportation

THE MEMBER AIRLINES OF THE International Civil Aviation Organization (ICAO) posted total operating revenues of $291 billion, up from $283 billion in 1996. Operating profits also climbed to $16.5 billion from $12.3 billion. As a whole, the industry managed to slow the growth in operating expenses, which ate into its net profit in 1996. The "net result" for 1997 was $9 billion in profits, up significantly from the $5.3 billion in 1996. The "net result" accounts for income taxes and a number of other factors not directly associated with flight operations, such as interest payments, subsidies, and the financial performance of affiliated companies. As a percentage of operating revenues, the net result rose to 3.1% in 1997 from 1.9% in 1996. Despite these positive results in 1997, the industry had not yet felt the full effects of the Asian economic crisis, which will negatively impact profits in 1998 and likely will lower future revenue growth.

World-wide traffic growth in 1997 remained strong. According to preliminary ICAO statistics, total (passengers, baggage, freight, and mail) ton-miles performed by ICAO airlines amounted to 234 billion, up 7.7% from the 217 billion in the previous year. The airlines boarded 1.45 billion passengers, a 4.2% increase from 1996. The passenger load factor also increased to a record 69% from 68%.

The operating profit of U.S.-scheduled airlines surged to $8.6 billion, an all-time high, according to preliminary figures from the Department of



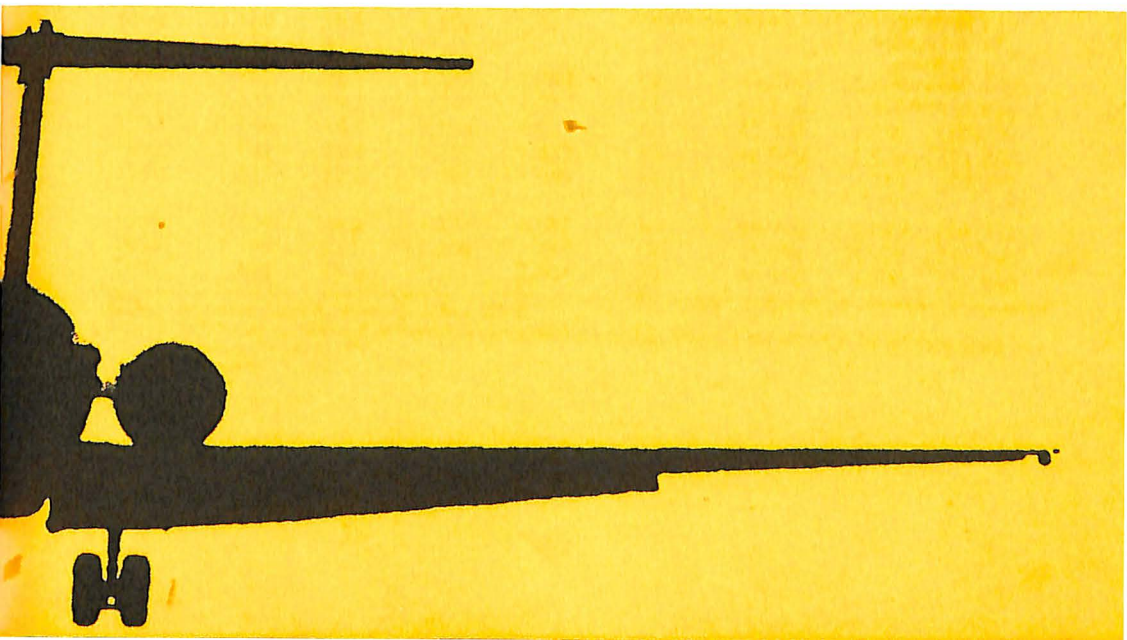
Transportation's Office of Aviation Statistics. That represented a 39% increase from 1996 and marked the fifth straight year of positive results. The 1997 profit was compounded of revenues totaling $109 billion (up $7.5 billion) and expenses of $101 billion (up $5 billion).

Domestic operations accounted for 75% of the U.S. airlines' total revenues, which reached $82 billion, up from $77 billion the previous year. International operations generated revenues of $27 billion, up from $25 billion.

U.S. air carriers experienced traffic gains in both domestic and international operations. In 1997, U.S. scheduled airlines flew a record 81 billion revenue ton-miles, which compares with 76 billion in 1996. Passenger ton-miles totaled 61 billion (up from 58 billion), and cargo ton-miles amounted to 20.5 billion (up from 17.8 billion).

A record 599 million passengers boarded in 1997, with 546 million in domestic operations (91%) and 53 million in international emplanements. Total boardings rose from 581 million in 1996, an increase of 3%. The revenue passenger load factors also set new records, 69% for domestic service and 74% for international operations.

The world airlines' fleet of turbine-engined aircraft increased by 983 units, according to the annual "Air World Survey," sponsored by Exxon International. The total number of turbine-engined aircraft in service at year-end 1997 was 22,110, compared with 21,127 in 1996. The number of in-service planes built in the United States was 12,487, or 56% of the total, another drop in a steady decline that began in 1987.



OPERATING REVENUES AND EXPENSES OF WORLD SCHEDULED AIRLINES[a]

Calendar Years 1994–1997
(Millions of U.S. Dollars)

	1994[r]	1995[r]	1996	1997[p]
OPERATING REVENUES:				
Scheduled Services:				
Passenger	$186,530	$205,000	$216,630	
Freight	23,890	25,980	27,900	
Mail	2,290	2,680	2,500	
				NA
Total Scheduled Services	$212,710	$233,660	$247,030	
Non-Scheduled Services	9,110	10,680	11,870	
Incidental	22,880	22,660	23,600	
Total Operating Revenues	$244,700	$267,000	$282,500	$291,000
OPERATING EXPENSES:				
Flight Operations	$ 61,350	$ 66,550	$ 74,800	
Maintenance & Overhaul	23,770	26,810	28,400	
Depreciation & Amortization	17,990	18,400	19,160	
User Charges & Station Expenses	41,640	46,140	47,810	NA
Passenger Services	25,610	28,070	29,290	
Ticketing, Sales & Promotion	37,360	39,590	41,450	
General, Administrative & Other	29,280	27,940	29,290	
Total Operating Expenses	$237,000	$253,500	$270,200	$274,500
OPERATING RESULT	$ 7,700	$ 13,500	$ 12,300	$ 16,500
Percent of Revenue	3.1%	5.1%	4.4%	5.7%
NET RESULT[b]	$ (200)	$ 4,500	$ 5,300	$ 9,000
Percent of Revenue	–0.1%	1.7%	1.9%	3.1%

Source: International Civil Aviation Organization, "Civil Aviation Statistics of the World" (Annually).
a Excludes domestic operations in the Commonwealth of Independent States.
b Net Result equals Operating Result minus non-operating items, including interest, income taxes, retirement of property and equipment, affiliated companies, and subsidies.
NA Not available.
p Preliminary.
r Revised.
() Denotes loss.

TRAFFIC STATISTICS
WORLD AIRLINE SCHEDULED SERVICE[a]
Calendar Years 1970–1997

Year	Passengers Carried	Freight Tons Carried	Passenger-Miles Performed	Seat-Miles Available	Passenger Load Factor	Ton-Miles Performed: Freight	Ton-Miles Performed: Mail	Ton-Miles Performed: TOTAL (Passengers & Baggage, Freight, Mail)
	(Millions)		(Billions)		(Percent)	(Millions)		
1970	383	6.7	286	522	55%	8,230	2,100	38,820
1971	411	7.4	307	568	54	9,060	1,990	41,420
1972	450	8.0	348	609	57	10,290	1,900	46,690
1973	489	9.1	384	667	58	12,010	1,970	51,910
1974	515	9.5	408	688	59	13,030	1,980	55,270
1975	534	9.6	433	733	59	13,270	1,990	58,080
1976	576	10.3	475	789	60	14,750	2,080	63,880
1977	610	11.1	508	837	61	16,190	2,170	68,790
1978	679	11.7	582	902	65	17,770	2,240	77,770
1979	754	12.1	659	999	66	19,190	2,350	86,890
1980	748	12.2	677	1,071	63	20,120	2,520	89,720
1981	752	12.0	695	1,092	64	21,150	2,600	92,810
1982	766	12.8	710	1,115	64	21,600	2,650	94,840
1983	798	13.5	739	1,151	64	24,050	2,740	100,280
1984	848	14.8	794	1,226	65	27,170	2,950	109,050
1985	899	15.1	850	1,293	66	27,290	3,010	114,860
1986	960	16.2	902	1,389	65	29,580	3,110	122,470
1987	1,028	17.7	988	1,471	67	33,100	3,220	134,570
1988	1,082	19.0	1,060	1,568	68	36,480	3,310	145,290
1989	1,109	19.9	1,102	1,621	68	39,140	3,460	152,730
1990	1,165	20.3	1,177	1,740	68	40,270	3,650	161,120
1991[r]	1,135	19.3	1,147	1,727	66	40,110	3,480	158,030
1992[r]	1,146	19.4	1,199	1,821	66	42,900	3,510	165,850
1993[r]	1,142	19.9	1,211	1,872	65	46,880	3,580	171,660
1994[r]	1,233	22.6	1,305	1,969	66	52,890	3,710	187,280
1995[r]	1,304	24.5	1,397	2,087	67	56,940	3,860	201,330
1996	1,390	25.6	1,508	2,210	68	61,090	3,970	216,890
1997[p]	1,448	28.8	1,597	2,307	69	68,380	4,100	233,660

Source: International Civil Aviation Organization (ICAO).
a Includes international and domestic traffic on scheduled service performed by the airlines of the 185 states which were members of ICAO in 1997.
p Preliminary.
r Revised.

OPERATING REVENUES AND EXPENSES OF U.S. AIR CARRIERS[a] DOMESTIC AND INTERNATIONAL OPERATIONS

Calendar Years 1964–1997
(Millions of Dollars)

Year	TOTAL OPERATIONS[b]			Domestic Operations			International Operations		
	Operating Revenues	Operating Expenses	Operating Profit (or Loss)	Operating Revenues	Operating Expenses	Operating Profit (or Loss)	Operating Revenues	Operating Expenses	Operating Profit (or Loss)
1964	$ 4,251	$ 3,781	$ 470	$ 3,169	$ 2,849	$ 320	$ 1,082	$ 932	$ 150
1965	4,958	4,286	672	3,691	3,239	452	1,267	1,047	220
1966	5,745	4,970	775	4,171	3,670	502	1,574	1,300	274
1967	6,865	6,157	708	4,981	4,560	421	1,884	1,597	287
1968	7,753	7,248	505	5,691	5,397	295	2,062	1,852	210
1969	8,791	8,403	387	6,936	6,613	322	1,855	1,790	65
1970	9,290	9,247	43	7,180	7,181	(1)	2,109	2,066	44
1971	10,046	9,717	328	7,753	7,496	257	2,292	2,221	71
1972	11,163	10,578	584	8,652	8,158	493	2,512	2,420	91
1973	12,419	11,834	585	9,694	9,200	494	2,725	2,633	91
1974	14,703	13,978	725	11,546	10,761	785	3,157	3,218	(60)
1975	15,356	15,229	128	12,020	11,903	117	3,336	3,326	11
1976	17,503	16,781	721	13,899	13,324	575	3,605	3,457	147
1977	19,926	19,018	908	15,822	15,166	657	4,104	3,852	252
1978	22,892	21,527	1,366	18,189	17,172	1,018	4,703	4,355	348
1979	27,227	27,028	199	21,652	21,523	129	5,575	5,505	69
1980	33,728	33,949	(222)	26,404	26,409	(6)	6,543	6,766	(223)
1981	36,211	36,612	(401)	28,788	29,051	(264)	6,390	6,574	(184)
1982	36,066	36,804	(739)	28,728	29,478	(750)	6,435	6,452	(17)
1983	38,593	38,231	362	31,014	31,186	(171)	7,163	6,693	470
1984	44,060	41,946	2,114	35,394	33,812	1,582	7,975	7,485	490
1985	48,580	47,207	1,372	37,629	36,611	1,018	8,302	7,984	319
1986	50,086	48,855	1,231	41,001	39,984	1,060	8,621	8,458	163
1987	56,787	54,339	2,448	45,658	43,925	1,733	10,925	10,226	698
1988	63,679	60,236	3,443	50,187	47,739	2,448	13,402	12,403	998
1989	69,225	67,413	1,812	54,314	52,460	1,855	14,911	14,954	(43)
1990	75,984	77,898	(1,913)	57,994	58,983	(989)	17,990	18,914	(924)
1991	75,158	76,943	(1,785)	56,230	56,758	(528)	18,928	20,185	(1,257)
1992	78,140	80,585	(2,444)	57,654	58,801	(1,147)	20,486	21,784	(1,298)
1993	84,559	83,121	1,438	63,233	61,157	2,076	21,326	21,964	(637)
1994	88,313	85,600	2,713	65,949	63,758	2,191	22,364	21,842	522
1995	94,318	88,455	5,863	70,885	66,120	4,765	23,433	22,335	1,098
1996	101,937	95,728	6,209	76,891	71,573	5,317	25,047	24,155	892
1997[P]	109,410	100,787	8,623	82,159	75,600	6,559	27,251	25,186	2,065

Source: Department of Transportation, Office of Aviation Statistics, "Air Carrier Financial Statistics Quarterly" (Quarterly).
NOTE: Detail may not add to totals because of rounding.
a Scheduled and non-scheduled service for all certificated route air carriers. Excludes supplemental air carriers, commuters, and air taxis.
b For 1980 and subsequent years, includes 'Other' operations not reported as 'Domestic' or 'International.'
p Preliminary.

U.S. AIR CARRIERS
TOTAL ASSETS AND INVESTMENT IN EQUIPMENT

Calendar Years 1969–1997
(Millions of Dollars)

Year	TOTAL Assets	Value of Flight Equipment	Value of Ground Property & Equipment & Other[a]	Less: Reserves for Depreciation & Overhaul	Equals: Net Value of Owned Operating Property & Equipment	Investment in Operating Property and Equipment as a Percent of Total Assets
1969	$ 12,069	$ 9,943	$ 1,516	$ 3,560	$ 7,899	65.4%
1970	12,913	10,950	1,951	4,120	8,782	68.0
1971	12,998	11,221	2,028	4,649	8,600	66.2
1972	13,635	11,918	2,225	5,115	9,028	66.2
1973	14,464	12,908	2,424	5,693	9,639	66.6
1974	15,200	13,538	2,539	6,252	9,826	64.6
1975	15,064	14,035	2,635	6,823	9,847	65.4
1976	15,454	14,399	2,792	7,585	9,605	62.2
1977	16,869	14,822	2,997	8,141	9,679	57.4
1978	20,745	16,127	3,367	8,799	10,696	51.6
1979	24,907	18,561	3,985	9,746	12,800	51.4
1980	28,900	20,859	4,682	10,309	15,233	52.7
1981	30,513	22,375	5,175	11,028	16,521	54.1
1982	31,525	23,786	5,424	11,405	17,804	56.5
1983	35,213	26,588	6,191	12,910	19,868	56.4
1984	36,769	28,509	6,061	14,043	20,527	55.8
1985	40,978	30,402	6,772	15,467	21,707	53.0
1986	47,105	31,750	8,468	14,764	25,454	54.0
1987	51,436	33,177	9,223	15,580	26,820	52.1
1988	56,047	35,781	10,248	17,450	28,579	51.0
1989	62,454	38,812	11,903	19,018	31,697	50.8
1990	67,769	40,215	13,523	20,593	33,144	48.9
1991	70,332	42,897	14,285	22,009	35,173	50.0
1992	75,426	48,563	15,219	24,445	39,337	52.2
1993	82,399	51,513	15,438	24,949	42,003	51.0
1994	84,442	51,951	15,844	26,476	41,319	48.9
1995	89,782	56,018	16,804	29,056	43,766	48.7
1996	95,184	59,206	16,661	30,029	45,838	48.2
1997[p]	104,778	66,455	17,639	32,867	51,227	48.9

Source: Department of Transportation, Office of Aviation Statistics, "Air Carrier Financial Statistics Quarterly" (Quarterly).
a Includes land and construction in progress.
p Preliminary.

SOURCES OF OPERATING REVENUES OF U.S. AIR CARRIERS[a] DOMESTIC AND INTERNATIONAL OPERATIONS

Calendar Years 1983–1997
(Millions of Dollars)

Year	TOTAL Operating Revenues	Passenger Service[b]	Mail	Freight[b] & Air Express	Excess Baggage	Other[c]
DOMESTIC OPERATIONS						
1983	$31,014	$27,519	$ 516	$1,602	$ 52	$ 1,326
1984	35,393	31,437	552	1,716	70	1,618
1985	37,629	33,343	733	1,581	78	1,895
1986	41,001	33,814	679	4,278	85	2,159
1987	45,658	37,492	704	4,952	67	2,443
1988	50,187	41,002	789	5,807	72	2,518
1989	54,314	43,670	767	5,408	70	4,399
1990	57,994	46,282	747	4,276	76	6,613
1991	56,230	44,594	734	4,487	78	6,337
1992	57,654	45,246	937	4,655	87	6,729
1993	63,233	49,289	974	5,266	91	7,612
1994	65,949	50,504	971	5,844	98	8,531
1995	70,885	53,971	1,050	6,546	92	9,227
1996	76,891	59,381	1,024	7,029	94	9,362
1997[p]	82,159	62,510	1,087	7,441	101	11,020
INTERNATIONAL OPERATIONS						
1983	$ 7,163	$ 5,605	$ 152	$ 999	$ 23	$ 384
1984	7,975	6,074	158	1,169	27	546
1985	8,302	6,451	161	1,130	28	532
1986	8,621	6,551	154	1,451	28	437
1987	10,925	8,374	180	1,783	33	555
1988	13,402	10,357	183	2,150	39	672
1989	14,911	11,181	188	2,417	47	1,078
1990	17,990	13,468	223	2,602	43	1,654
1991	18,928	14,103	223	3,134	50	1,419
1992	20,486	15,664	247	2,980	47	1,547
1993	21,326	15,915	237	3,220	49	1,905
1994	22,364	16,300	212	3,606	46	2,201
1995	23,433	16,788	216	3,994	48	2,387
1996	25,047	17,337	255	4,664	47	2,743
1997[p]	27,251	18,283	273	5,127	56	3,512

Source: Department of Transportation, Office of Aviation Statistics, "Air Carrier Financial Statistics Quarterly" (Quarterly).
NOTE: Detail may not add to totals because of rounding.
a Scheduled and non-scheduled service for all certificated route air carriers. Excludes supplemental air carriers, commuters, and air taxis.
b Scheduled and charter.
c Includes subsidy, reservation cancellation fees, miscellaneous operating revenues, and other transport-related revenues.
p Preliminary.

OPERATING EXPENSES OF U.S. AIR CARRIERS[a] DOMESTIC AND INTERNATIONAL OPERATIONS

Calendar Years 1983–1997
(Millions of Dollars)

Year	TOTAL Operating Expenses	Flying Operations	Maintenance	Passenger Service	Aircraft & Traffic Servicing	Promotion and Sales	Depreciation & Amortization	Other[b]
DOMESTIC OPERATIONS								
1983	$31,186	$11,370	$2,878	$2,983	$ 5,104	$ 4,764	$2,107	$ 1,980
1984	33,812	12,161	3,176	3,192	5,369	5,310	2,223	2,380
1985	36,611	12,684	3,604	3,464	5,781	6,089	2,318	2,670
1986	39,934	11,368	4,475	3,793	7,680	6,820	2,652	3,171
1987	43,925	12,509	4,951	4,169	8,575	7,399	2,855	3,468
1988	47,739	13,176	5,643	4,444	9,527	8,235	2,977	3,737
1989	52,460	14,749	6,184	4,775	9,449	8,718	3,078	5,507
1990	58,983	18,166	6,921	5,220	9,094	9,102	3,273	7,207
1991	56,758	16,831	6,682	5,068	9,140	8,856	3,217	6,964
1992	58,801	17,203	6,884	5,327	9,783	8,936	3,340	7,328
1993	61,157	17,622	7,025	5,241	10,172	9,387	3,621	8,089
1994	63,758	17,912	7,312	5,305	10,543	9,882	3,782	9,023
1995	66,120	18,926	7,656	5,281	11,103	9,974	3,762	9,417
1996	71,573	21,515	8,292	5,577	11,569	10,414	3,878	10,328
1997[p]	75,600	22,109	9,442	5,817	12,046	10,770	3,934	11,483
INTERNATIONAL OPERATIONS								
1983	$ 6,693	$ 2,490	$ 548	$ 664	$ 936	$ 1,162	$ 389	$ 505
1984	7,485	2,629	677	749	975	1,308	446	701
1985	7,984	2,738	768	852	1,069	1,414	482	662
1986	8,458	2,402	901	877	1,386	1,665	518	711
1987	10,226	2,836	1,096	1,059	1,749	2,094	533	860
1988	12,403	3,230	1,332	1,280	2,193	2,742	618	1,009
1989	14,954	3,919	1,724	1,454	2,483	3,108	746	1,520
1990	18,878	5,454	2,051	1,738	2,657	3,833	887	2,295
1991	20,185	5,636	2,152	1,861	2,831	4,602	892	2,210
1992	21,784	5,843	2,148	2,204	3,255	5,229	1,033	2,073
1993	21,964	5,928	1,967	2,175	3,072	5,339	1,077	2,406
1994	21,842	5,842	2,064	2,311	3,336	4,335	1,237	2,716
1995	22,335	6,181	2,273	2,467	3,748	3,527	1,106	3,033
1996	24,155	7,279	2,616	2,596	3,736	3,354	1,483	3,091
1997[p]	25,186	7,433	2,874	2,715	3,826	3,475	1,281	3,584

Source: Department of Transportation, Office of Aviation Statistics, "Air Carrier Financial Statistics Quarterly" (Quarterly).
NOTE: Detail may not add to totals because of rounding.
a Scheduled and non-scheduled service for all certificated route air carriers. Excludes supplemental air carriers, commuters, and air taxis.
b General and administrative and other transport-related expenses.
p Preliminary.

TRAFFIC STATISTICS
U.S. AIR CARRIER SCHEDULED SERVICE[a]
Calendar Years 1964–1997

Year	Revenue Ton-Miles (Millions)			Total Available Ton-Miles (Millions)	Total Revenue Load Factor	Aircraft Revenue Miles (Millions)	Average Overall Flight Stage Length (Miles)	Average Available Seats per Aircraft Mile
	Passenger	Cargo[b]	Total					
1964	5,630	1,803	7,434	15,514	47.9%	1,189	301	93
1965	6,629	2,356	8,986	18,408	48.8	1,354	322	96
1966	7,736	2,949	10,686	20,939	51.0	1,482	339	98
1967	9,561	3,475	13,036	26,968	48.3	1,834	371	101
1968	11,023	4,226	15,249	33,221	45.9	2,146	401	107
1969	12,197	4,701	16,898	38,664	43.7	2,385	443	112
1970	13,171	4,994	18,166	41,693	43.6	2,426	473	117
1971	13,565	5,120	18,685	44,139	42.3	2,378	476	125
1972	15,241	5,506	20,746	45,583	45.5	2,376	471	129
1973	16,196	6,046	22,242	49,019	45.4	2,448	477	135
1974	16,292	6,133	22,425	46,848	47.9	2,258	478	140
1975	16,281	5,905	22,186	47,254	46.9	2,241	476	143
1976	17,899	6,222	24,121	49,325	48.9	2,320	480	146
1977	19,322	6,587	25,909	52,284	49.6	2,419	490	149
1978	22,678	7,001	29,679	54,765	54.2	2,520	502	152
1979	26,202	7,189	33,390	60,844	54.9	2,791	517	154
1980	25,519	7,084	32,603	62,983	51.8	2,816	526	158
1981	24,889	7,060	31,949	61,186	52.2	2,703	519	161
1982	25,964	6,886	32,850	62,401	52.6	2,699	544	167
1983	28,183	7,573	35,756	65,385	54.7	2,809	558	169
1984	30,512	8,185	38,697	72,223	53.6	3,134	575	168
1985	33,640	7,689	41,329	76,059	54.3	3,320	569	168
1986	36,655	9,026	45,681	85,140	53.7	3,725	580	168
1987	40,453	10,016	50,469	92,209	54.7	3,988	606	167
1988	42,330	11,469	53,800	97,899	55.0	4,141	618	169
1989	43,271	12,187	55,458	100,082	55.4	4,193	633	169
1990	45,793	12,549	58,342	107,559	54.2	4,491	649	170
1991	44,795	12,130	56,925	105,599	53.9	4,416	651	169
1992	47,855	13,199	61,054	112,749	54.2	4,661	661	169
1993	48,968	14,120	63,088	115,473	54.6	4,846	669	166
1994	51,938	16,052	67,989	120,798	56.3	5,033	668	163
1995	54,066	16,921	70,987	126,154	56.3	5,293	657	160
1996[r]	57,866	17,754	75,621	131,381	57.6	5,501	668	160
1997	60,543	20,513	81,057	137,970	58.7	5,679	696	160

Source: Department of Transportation, Office of Aviation Statistics, "Air Carrier Traffic Statistics Monthly" (Monthly).
NOTE: Detail may not add to totals because of rounding.
a Includes international and domestic operations.
b Includes freight, air express, U.S. and foreign mail.
r Revised.

PASSENGER STATISTICS
U.S. AIR CARRIER SCHEDULED SERVICE
DOMESTIC AND INTERNATIONAL OPERATIONS

Calendar Years 1983–1997

Year	Revenue Passenger Enplanements (Thousands)	Average Passenger Trip-Length (Miles)	Revenue Passenger Miles (Millions)	Available Seat Miles (Millions)	Revenue Passenger Load Factor[a]
DOMESTIC OPERATIONS					
1983	296,721	765	226,909	379,150	59.8
1984	321,047	759	243,692	422,507	57.7
1985	357,109	758	270,584	445,826	60.7
1986	393,864	767	302,090	497,991	60.7
1987	416,831	779	324,637	526,958	61.6
1988	419,210	786	329,309	536,663	61.4
1989	416,331	793	329,975	530,079	62.3
1990	423,565	803	340,231	563,065	60.4
1991	412,360	806	332,566	543,638	61.2
1992	431,693	806	347,931	557,989	62.4
1993	443,172	799	354,177	571,489	62.0
1994	481,755	787	378,990	585,438	64.7
1995	499,000	791	394,708	603,917	65.4
1996[r]	530,708	802	425,596	626,389	67.9
1997	546,157	814	444,655	643,650	69.1
INTERNATIONAL OPERATIONS					
1983	21,917	2,506	54,920	85,388	64.3
1984	23,636	2,599	61,424	92,817	66.2
1985	24,913	2,642	65,819	101,963	64.6
1986	25,082	2,570	64,456	109,445	58.9
1987	30,847	2,588	79,834	121,763	65.6
1988	35,404	2,655	93,992	140,140	67.1
1989	37,361	2,750	102,739	154,297	66.6
1990	41,995	2,803	117,695	170,310	69.1
1991	39,941	2,889	115,389	171,561	67.3
1992	43,415	3,009	130,622	194,784	67.1
1993	45,348	2,988	135,508	200,151	67.7
1994	47,093	2,981	140,391	198,893	70.6
1995	48,773	2,992	145,948	203,160	71.8
1996[r]	50,526	3,029	153,067	208,682	73.3
1997	52,738	3,049	160,779	216,913	74.1

Source: Department of Transportation, Office of Aviation Statistics, "Air Carrier Traffic Statistics Monthly" (Monthly).

a Revenue passenger miles as a percent of available seat miles.

r Revised.

TURBINE-ENGINED AIRCRAFT IN THE WORLD AIRLINE FLEET

(By Model, 1993–1997)

	1993	1994	1995[a]	1996[a]	1997[a]
TOTAL AIRCRAFT IN SERVICE	17,284	18,347	20,041	21,127	22,110
Turbojets—TOTAL	11,345	12,000	12,810	13,425	14,024
Aerospatiale SE-210 Caravelle	29	28	27	20	12
Airbus A300	374	391	414	405	397
Airbus A310	222	217	218	222	224
Airbus A319	—	—	—	18	66
Airbus A320	413	463	510	549	612
Airbus A321	—	17	35	52	72
Airbus A330	1	10	38	49	63
Airbus A340	20	44	60	86	119
Antonov 72/74	—	—	4	8	8
Antonov 124	13	13	11	16	16
Antonov 225	—	—	—	1	1
Avro RJ-70/85/100	12	30	51	77	100
B.Ae./Aerospatiale Concorde	14	13	13	13	13
B.Ae. 146	185	196	204	206	208
B.Ae. One-Eleven	121	120	112	121	122
B.Ae. Trident	9	9	—	—	—
B.Ae. (HS) 125	23	22	19	20	18
Beech 400 Beechjet	2	2	2	3	3
Boeing 707/720	151	151	123	122	112
Boeing 727	1,390	1,373	1,346	1,363	1,322
Boeing 737	2,363	2,476	2,569	2,623	2,752
Boeing 747	918	957	963	996	1,040
Boeing 757	566	629	697	718	770
Boeing 767	515	550	580	628	663
Boeing 777	—	—	13	45	111
Canadair CL-601 Challenger	4	2	2	2	2
Canadair Regional Jet	23	49	83	136	189
Cessna Citation I/II/III	31	36	44	45	41
Convair 880/990	1	1	—	—	—
Dassault Falcon 10/20/50	46	60	66	65	60
Dassault Mercure	8	5	—	—	—
Embraer RJ135/RJ145	—	—	—	—	34
Fokker F-28 Fellowship	190	185	185	175	184
Fokker 70	—	—	23	34	36
Fokker 100	220	253	267	272	274
Gulfstream II/III/IV G-1159	17	16	15	16	16
Ilyushin IL-62	49	84	106	105	105
Ilyushin IL-76	83	154	209	238	227
Ilyushin IL-86	12	37	51	98	80
Ilyushin IL-96	—	5	5	7	7
Israel Aircraft 1121/1124	12	13	13	11	11
Learjet	28	39	49	54	53
Lockheed L-1011 Tristar	213	208	190	190	169
Lockheed L-1329 Jetstar	4	4	3	3	1
MBB Hansa HFB-320	—	3	13	16	16
McDonnell Douglas DC-8	264	270	274	263	257
McDonnell Douglas DC-9	767	791	787	785	759
McDonnell Douglas DC-10	354	347	335	351	345
McDonnell Douglas MD-11	107	127	146	159	171

(Continued on next page)

TURBINE-ENGINED AIRCRAFT IN THE WORLD AIRLINE FLEET

(By Model, 1993–1997, continued)

	1993	1994	1995[a]	1996[a]	1997[a]
Turbojets (continued)					
McDonnell Douglas MD-80	1,067	989	1,115	1,120	1,142
McDonnell Douglas MD-90	—	—	14	36	62
Rockwell Sabreliner 60	1	—	—	—	—
Tupolev Tu-134	138	155	192	188	189
Tupolev Tu-154	225	283	379	422	451
Tupolev Tu-204	—	5	4	6	6
Yakolev Yak-40/42	140	168	231	267	313
Turbine-Powered Helicopters—TOTAL	242	295	774	851	1,014
Aerospatiale SA-315 Lama	—	—	2	2	2
Aerospatiale SA-316 Alouette III	—	—	3	5	5
Aerospatiale SA-318 Alouette II	1	1	1	2	1
Aerospatiale (Nurtanio) SA-330 Puma	28	17	22	20	20
Aerospatiale AS-332 Super Puma	5	16	69	70	78
Aerospatiale AS-350 Ecureuil/ Astar	3	4	40	49	104
Aerospatiale AS-355 Ecureuil 2/ Twinstar	8	8	15	15	15
Aerospatiale SA-365 Dauphin II	13	17	24	25	26
Agusta A109	—	1	1	1	—
Bell (Agusta/Fuji) 204	3	2	5	4	4
Bell 205	2	1	19	16	14
Bell 206 Jetranger/Longranger	36	54	145	155	151
Bell 212	20	21	105	106	101
Bell 214	—	4	12	11	7
Bell 222 UT	—	1	1	2	2
Bell 407	—	—	—	—	1
Bell 412	17	16	25	25	31
Boeing 107	—	—	16	16	15
Boeing Vertol BV-234	—	—	9	10	9
Hughes (Kawasaki) 500/369D	—	—	12	12	17
Kamov Ka-26	—	—	—	—	16
Kamov Ka-32	—	—	2	2	2
MBB BK-117	—	—	2	2	2
MBB/Nurtanio Bo.105	41	41	58	58	67
Mil Mi-2	—	—	—	24	40
Mil Mi-6	—	—	—	—	6
Mil Mi-8	—	17	18	48	91
Mil Mi-14	—	—	—	1	1
Mil Mi-26	—	—	—	—	7
Sikorsky S-55T	5	5	4	6	6
Sikorsky S-58T	4	1	1	1	2
Sikorsky S-61	33	42	81	82	90
Sikorsky S-62	—	1	1	1	1
Sikorsky S-64	—	—	5	5	5
Sikorsky S-76	23	25	72	75	75

(Continued on next page)

TURBINE-ENGINED AIRCRAFT IN THE WORLD AIRLINE FLEET

(By Model, 1993–1997, continued)

	1993	1994	1995[a]	1996[a]	1997[a]
Turboprops—TOTAL	5,697	6,052	6,457	6,851	7,072
Aerospatiale N.262/Mohawk 298	10	12	13	9	9
Aerospatiale/Aeritalia ATR 42	242	245	259	283	296
Aerospatiale/Aeritalia ATR 72	103	138	158	177	177
Airtech CN-235	24	24	25	24	24
Antonov An-8	—	—	—	—	2
Antonov An-12	25	23	46	68	71
Antonov An-22	2	2	2	5	3
Antonov An-24/26/28/30/32	258	307	400	484	530
B.Ae. ATP	50	53	52	55	50
B.Ae. Vanguard	3	2	1	—	—
B.Ae. Viscount	23	25	24	20	18
B.Ae. (HP-137) Jetstream 31	296	306	296	274	287
B.Ae. Jetstream 41	18	30	66	74	91
B.Ae. HS-748	115	122	126	126	125
Beech 18 Turbo	1	21	21	20	20
Beech 90 King Air	38	30	35	39	46
Beech 99	139	140	143	140	138
Beech 100 King Air	38	44	46	48	39
Beech 200/300 Super King Air	94	101	121	126	122
Beech 1300	4	5	5	5	9
Beech 1900C/D	251	291	371	389	430
Bristol 175 Britannia	5	3	1	1	—
Canadair CL-44	8	4	2	1	—
CASA/Nurtanio C-212 Aviocar	102	107	114	111	113
Cessna 208 Caravan I	312	380	458	528	608
Cessna F406 Caravan II	19	21	35	28	30
Cessna 425/441 Conquest I/II	5	7	4	5	14
Convair 580/600/640	98	110	111	114	107
DHC-2/3 Turbo Beaver/Otter	6	9	17	22	20
DHC-5 Buffalo	1	1	1	1	1
DHC-6 Twin Otter	419	405	395	394	395
DHC-7 Dash 7	84	73	70	75	69
DHC-8 Dash 8	341	358	365	408	424
Dornier DO-228	116	126	106	112	114
Dornier DO-328	3	15	42	59	61
Douglas DC-3T Turbo Express	—	2	2	1	1
Embraer EMB-110 Bandeirante	189	188	192	211	200
Embraer EMB-120 Brasilia	267	276	254	295	308
Embraer EMB-121 Xingu	—	—	—	—	2
Fokker/Fairchild F-27/FH-227 Friendship	354	348	315	312	318
Fokker 50	152	164	171	176	171
GAF Nomad	11	22	18	13	15
Grumman G-21 Turbo Goose	1	1	1	—	—
Grumman G-73 Turbo Mallard	6	5	5	5	5
Grumman G-159 Gulfstream I	33	41	39	34	30

(Continued on next page)

TURBINE-ENGINED AIRCRAFT IN THE WORLD AIRLINE FLEET

(By Model, 1993–1997, continued)

	1993	1994	1995[a]	1996[a]	1997[a]
Turboprops (continued)					
Handley Page Herald	15	16	15	10	2
Harbin YU-12 II	33	40	41	42	42
IAI Arava	1	2	2	2	3
Ilyushin IL-18	29	33	33	38	34
Ilyushin IL-114	—	—	2	2	2
LET L-410	19	25	61	87	115
Lockheed L-188 Electra	56	65	51	53	36
Lockheed L-100/L-382 Hercules	53	14	56	56	45
Mitsubishi MU-2B	6	7	14	15	15
Nihon AMC YS-11	85	85	81	78	63
Pilatus Britten-Norman BN-2T Turbo Islander	2	2	2	5	6
Pilatus PC-6 Turbo Porter	—	—	25	28	30
Pilatus PC-XII	—	—	—	2	2
Piper PA-31T/42 Cheyenne	19	17	16	18	20
Piper T-1040	11	10	12	13	14
PZL (Antonov) An-28	3	1	6	6	3
Rockwell Turbo Commander	11	9	9	9	11
Saab SF-340A/B	347	347	355	379	396
Saab 2000	—	5	22	34	42
Shorts SC-5 Belfast	4	2	2	2	2
Shorts SC-7 Skyliner/Skyvan	25	31	35	35	32
Shorts 330	56	62	50	52	48
Shorts 360	148	108	106	104	103
Swearingen Merlin	49	49	38	45	53
Swearingen Metro	377	396	423	398	394
Transall C-160	6	6	6	—	—
Xian (Antonov) Y-7	61	65	66	66	66
TOTAL AIRCRAFT IN SERVICE	17,284	18,347	20,041	21,127	22,110
Number Manufactured in U.S.	10,523	10,913	11,775	12,117	12,487
Percent Manufactured in U.S.	60.9%	59.5%	58.8%	57.4%	56.5%
Turbojet Aircraft in Service	11,345	12,000	12,810	13,425	14,024
Number Manufactured in U.S.	8,759	8,949	9,265	9,520	9,789
Percent Manufactured in U.S.	77.2%	74.6%	72.3%	70.9%	69.8%
Turboprop Aircraft in Service	5,697	6,052	6,457	6,851	7,072
Number Manufactured in U.S.	1,624	1,793	2,002	2,074	2,172
Percent Manufactured in U.S.	28.5%	29.6%	31.0%	30.3%	30.7%
Turbine-Powered Helicopters In Service	242	295	774	851	1,014
Number Manufactured in U.S.	140	171	508	523	526
Percent Manufactured in U.S.	57.9%	58.0%	65.6%	61.5%	51.9%

Source: Exxon International Company, "Air World Survey," compiled by Aviation Data Service, Inc. (Annually).
NOTE: The "Air World Survey" covers aircraft in airline service as of December 31. Excludes air taxi operators.
a Includes aircraft operated in the Commonwealth of Independent State countries. Formerly grouped under Aeroflot and excluded from the summary.
b RJ-70 combined with B.Ae. 146.

PERCENT OF CIVIL TURBOJET ENGINE MARKET BY MANUFACTURER AND AIRCRAFT MODEL

as of December 1997

Aircraft Manufacturer and Model	Total Installed Engines	Engine Manufacturers					
		P&W	GE	RR	CFM	IAE	Other
TOTAL ENGINES	36,007	15,402	4,866	3,741	5,476	666	5,856
PERCENT SHARE	100.0%	42.8%	13.5%	10.4%	15.2%	1.8%	16.3%
Airbus A300[a]	298	17%	83%	–%	–%	–%	–%
Airbus A300B4-200	240	12	88	–	–	–	–
Airbus A300B4-600R	310	52	48	–	–	–	–
Airbus A310[a]	158	35	65	–	–	–	–
Airbus A310-300	294	42	58	–	–	–	–
Airbus A319	140	–	–	–	93	7	–
Airbus A320[a]	36	–	–	–	100	–	–
Airbus A320-200	1,174	–	–	–	62	38	–
Airbus A321	156	–	–	–	49	51	–
Airbus A330	132	44	23	33	–	–	–
Airbus A340	500	–	–	–	100	–	–
Antonov AN-72	8	–	–	–	–	–	100
Antonov AN-74	10	–	–	–	–	–	100
Antonov AN-124	64	–	–	–	–	–	100
AS Corvette	6	100	–	–	–	–	–
AS Caravelle	32	75	–	25	–	–	–
AS/BAe Concorde	52	–	–	100	–	–	–
Avro Int'l RJ	400	–	–	–	–	–	100
BAe 1-11	260	–	–	100	–	–	–
BAe 146	812	–	–	–	–	–	100
BAe HS 125	46	4	–	35	–	–	61
Beech 400 Beechjet	6	100	–	–	–	–	–
Boeing B-707[a]	104	100	–	–	–	–	–
Boeing B-707-320C	472	100	–	–	–	–	–
Boeing B-720	8	100	–	–	–	–	–
Boeing B-727 series[a]	1,209	87	–	13	–	–	–
Boeing B-727 Adv F	489	100	–	–	–	–	–
Boeing B-727-200[b]	321	100	–	–	–	–	–
Boeing B-727-200 ADV	2,115	100	–	–	–	–	–
Boeing B-737[a]	290	74	–	–	26	–	–
Boeing B-737-200	290	100	–	–	–	–	–
Boeing B-737-200 ADV	1,386	100	–	–	–	–	–
Boeing B-737-300	1,992	–	–	–	100	–	–
Boeing B-737-400	866	–	–	–	100	–	–
Boeing B-737-500	708	–	–	–	100	–	–
Boeing B-747[a]	1,584	42	47	10	–	–	–
Boeing B-747-100	508	94	–	6	–	–	–
Boeing B-747-200B	728	71	13	15	–	–	–
Boeing B-747-400	1,316	42	32	26	–	–	–
Boeing B-757[a]	212	34	–	66	–	–	–
Boeing B-757-200	1,332	45	–	55	–	–	–
Boeing B-767[a]	410	22	78	–	–	–	–
Boeing B-767-200ER	264	52	48	–	–	–	–
Boeing B-767-300ER	686	39	53	8	–	–	–
Boeing B-777	232	47	28	25	–	–	–
Canadair Regional Jet	398	–	100	–	–	–	–

(Continued on next page)

PERCENT OF CIVIL TURBOJET ENGINE MARKET BY MANUFACTURER AND AIRCRAFT MODEL (continued)

Aircraft Manufacturer and Model	Total Installed Engines	Engine Manufacturers					
		P&W	GE	RR	CFM	IAE	Other
Canadair CL 600/601	6	–%	67%	–%	–%	–%	33%
Cessna 500s	74	100	–	–	–	–	–
Cessna 650	20	–	–	–	–	–	100
Dassault Falcon	139	–	86	–	–	–	14
Embraer EMB-145	78	–	–	–	–	–	100
Fokker F-28[a]	140	–	–	100	–	–	–
Fokker F-28-4000	208	–	–	100	–	–	–
Fokker 70	82	–	–	100	–	–	–
Fokker 100	544	–	–	100	–	–	–
Gulfstream II/III/IV	32	–	–	100	–	–	–
IAI 1124	24	–	–	–	–	–	100
Ilyushin IL-62	416	–	–	–	–	–	100
Ilyushin IL-76[a]	448	–	–	–	–	–	100
Ilyushin IL-76TD	412	–	–	–	–	–	100
Ilyushin IL-86	320	–	–	–	–	–	100
Ilyushin IL-96	28	–	–	–	–	–	100
Learjet 23/24/25	48	–	100	–	–	–	–
Learjet 35/36/55/60	88	5	–	–	–	–	95
Lockheed JetStar	8	–	–	–	–	–	100
Lockheed L-1011	564	–	–	100	–	–	–
MBB Hansa Jet	32	–	100	–	–	–	–
Douglas DC-8	1,044	65	–	–	35	–	–
Douglas DC-9[a]	550	100	–	–	–	–	–
Douglas DC-9-30	996	100	–	–	–	–	–
Douglas DC-10[a]	339	35	65	–	–	–	–
Douglas DC-10-10	306	–	100	–	–	–	–
Douglas DC-10-30	396	–	100	–	–	–	–
MDC MD-11 series[a]	150	24	76	–	–	–	–
MDC MD-11[b]	372	49	51	–	–	–	–
MDC MD-80s[a]	328	100	–	–	–	–	–
MDC MD-82	1,166	100	–	–	–	–	–
MDC MD-83	476	100	–	–	–	–	–
MDC MD-88	316	100	–	–	–	–	–
MDC MD-90	126	–	–	–	–	100	–
Rockwell Sabreliner	2	–	100	–	–	–	–
Tupolev TU-134	378	–	–	–	–	–	100
Tupolev TU-154[a]	231	–	–	–	–	–	100
Tupolev TU-154B2	522	–	–	–	–	–	100
Tupolev TU-154M	564	–	–	–	–	–	100
Tupolev TU-204	14	–	–	–	–	–	100
Yakolev YAK-40	684	–	–	–	–	–	100
Yakolev YAK-42	282	–	–	–	–	–	100

Source: Aerospace Industries Association, based on data from Aviation Data Service.
a Data for major (100 or more aircraft) series excluded and reported separately.
b Series bearing same designation as model number, but qualifies for separate reporting as a major series.
KEY: AS = Aerospatiale; BAe = British Aerospace; CFM = CFM International; GE = General Electric; IAE = International Aero Engines; IAI = Israel Aircraft Industries; MBB = Messerschmitt Bolkow Blohm; MDC = McDonnell Douglas; P&W = Pratt & Whitney; RR = Rolls-Royce.

ACTIVE[a] U.S. AIR CARRIER FLEET

By Type of Aircraft, Number of Engines and Model
Active as of December 1993–1997

	1993	1994	1995	1996	1997
TOTAL	7,297	7,370	7,411	7,478	7,616
Turbojets—TOTAL	4,584	4,634	4,832	4,922	5,108
Four-Engine—TOTAL	410	420	435	440	450
Boeing 707	13	16	6	5	3
Boeing 747	183	186	189	195	201
B.Ae./AVRO 146	20	15	21	21	26
McDonnell Douglas DC-8	194	203	219	219	220
Three-Engine—TOTAL	1,292	1,236	1,210	1,212	1,224
Boeing 727	953	906	877	856	874
Lockheed L-1011	100	86	97	102	79
McDonnell Douglas DC-10/MD-11	239	244	236	254	271
Twin-Engine—TOTAL	2,882	2,978	3,187	3,270	3,434
Airbus A-300	58	63	53	62	68
Airbus A-310	27	17	23	27	28
Airbus A-319	—	—	—	—	2
Airbus A-320	75	86	104	113	119
Boeing 737	1,013	1,012	1,055	1,055	1,077
Boeing 757	375	395	440	457	487
Boeing 767	187	194	210	213	234
Boeing 777	—	—	7	15	23
Canadair CL-600	5	—	35	53	77
Cessna C500/C501	3	—	—	—	—
Embraer EMB-145	—	—	—	—	11
Fokker F-28	129	148	155	155	142
Learjet LR-25	—	—	—	2	3
Learjet LR-35	1	2	3	4	9
McDonnell Douglas DC-9/ MD-80/MD-90	1,009	1,061	1,102	1,114	1,154
Turboprops—TOTAL	1,868	1,782	1,715	1,704[r]	1,654
Four-Engine—TOTAL	102	87	81	56	45
Canadair CL44D	1	1	1	—	—
De Havilland DHC-7	38	27	16	12	5
Lockheed 188 Electra	45	41	43	23	22
Lockheed 382	18	18	21	21	18
Twin-Engine—TOTAL	1,751	1,695	1,634	1,643[r]	1,604
Beech BE65	—	—	—	4[r]	4
Beech BE90	3	1	1	3	2
Beech BE95	—	1	—	—	—
Beech BE99	29	41	36	27	28
Beech BE100	1	1	1	2	1

(Continued on next page)

ACTIVE[a] U.S. AIR CARRIER FLEET (Continued)

By Type of Aircraft, Number of Engines, and Model
Active as of December 1993–1997

	1993	1994	1995	1996	1997
Twin-Engine (continued)					
Beech BE200	9	7	4	11	7
Beech BE1900	251	281	289	254	243
B.Ae. ATP	9	9	10	10	9
B.Ae. Jetstream	247	237	174	223	215
CASA C212 Aviocar	1	1	1	—	—
Cessna C425	2	—	—	—	—
Cessna C441	—	2	2	2	2
Convair 580/600/640	16	29	34	23	19
DeHavilland DHC-6	67	53	44	38	49
DeHavilland DHC-8	120	142	137	151	154
Dornier DO228	13	7	—	—	—
Dornier DO328	—	—	33	39	47
Embraer EMB110	14	15	14	3	1
Embraer EMB120	217	223	217	235	227
Fairchild/Fokker F-27/FH-227	50	37	35	36	44
Grumman G-73	—	5	5	5	5
Gulfstream 690A	—	—	—	—	1
McKinnon G-21	2	2	2	4	4
Mitsubishi MU-2	—	—	—	3	11
Nihon YS-11	25	25	11	11	—
Piper PA31T	79	1	5	9	10
Piper 42	—	1	1	2	2
Saab-Fairchild SF340	209	202	219	226	253
Shorts SC-7	6	5	3	3	3
Shorts SD-3	74	63	38	39	33
SNAIS ATR-42	108	111	110	99	95
SNAIS ATR-72	27	44	51	51	55
Swearingen SA-226	14	11	13	9	7
Swearingen SA-227	158	138	144	121	73
Single-Engine—TOTAL	15	—	—	5	5
Piston-Engine—TOTAL	721	826	746	731[r]	720
Four-Engine—TOTAL	22	19	15	18	19
Douglas DC-6	21	18	15	18	19
Douglas DC-7	1	1	—	—	—
Three-Engine—TOTAL	—	5	1	7	4
Pilatus Britten-Norman BN2A-MK-3 Turbo Islander	—	5	1	7	4
Twin-Engine—TOTAL	293	337	331	309[r]	290
Single-Engine—TOTAL	406	465	399	397	407
Helicopters—TOTAL	124	128	118	121	134

Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Annually).
NOTE: Effective 1978, includes certificated route air carriers, supplemental air carriers (charters), multi-engine aircraft in passenger service of commuters, and all aircraft over 12,500 pounds operated by air taxis, commercial operators, and travel clubs.
a "Active aircraft" equals the average number of aircraft reported in operation during the last quarter of the year.
NA Not Available.
r Revised.

JET FUEL COSTS AND CONSUMPTION BY U.S. AIR CARRIERS[ar]

Calendar Years 1978–1997

Year	Gallons Consumed (Millions)	Total Cost (Millions)	Cost Per Gallon (Cents)	Cost Index (1982 = 100)	Cost of Fuel as Percent of Cash Operating Expenses
1978	10,359.5	$ 4,069.6	39.3 ¢	39.0	19.4%
1979	11,042.0	6,354.0	57.5	57.1	24.3
1980	10,854.0	9,818.3	90.5	89.7	30.0
1981	10,326.9	10,827.5	104.8	104.0	29.9
1982	9,942.5	10,024.6	100.8	100.0	27.5
1983	10,472.5	9,320.9	89.0	88.3	24.7
1984	11,424.0	9,740.2	85.3	84.6	24.0
1985	12,072.6	9,689.8	80.3	79.6	22.3
1986	13,006.9	7,275.8	55.9	55.5	15.5
1987	14,139.6	7,895.6	55.8	55.4	15.0
1988	14,871.4	7,943.5	53.4	53.0	13.5
1989	15,115.8	9,104.3	60.2	59.7	13.9
1990	15,945.9	12,405.9	77.8	77.2	16.3
1991	14,682.9	10,275.2	70.0	69.4	13.7
1992	15,413.1	10,095.3	65.5	65.0	12.8
1993	15,569.3	9,378.7	60.2	59.7	11.7
1994	16,041.3	8,798.5	54.8	54.4	10.7
1995	16,233.1	9,053.2	55.8	55.3	10.8
1996	16,845.7	10,979.4	65.2	64.6	12.2
1997	17,361.1	10,993.3	63.3	62.8	11.6

Source: Air Transport Association of America, "Airline Cost Index" (Quarterly).
a Majors and Nationals.
r Revised.

U.S. CIVIL AND JOINT-USE AIRCRAFT FACILITIES[a] BY TYPE AND STATE

As of December 31, 1997

State	TOTAL[a]	Public[b]	Paved	Lighted	State	TOTAL[a]	Public[b]	Paved	Lighted
Alabama	237	98	153	99	Nevada	120	55	60	34
Alaska	553	405	66	161	New Hampshire	94	27	50	19
Arizona	272	73	158	73	New Jersey	362	54	158	50
Arkansas	275	100	180	100	New Mexico	164	64	79	50
California	931	267	678	250	New York	537	169	217	134
Colorado	382	79	171	84	North Carolina	355	115	157	118
Connecticut	136	24	88	26	North Dakota	432	93	89	97
Delaware	35	11	13	12	Ohio	737	179	290	180
Dist. of Col.	17	3	17	4	Oklahoma	418	152	216	131
Florida	781	130	337	150	Oregon	411	100	163	76
Georgia	400	110	191	114	Pennsylvania	760	144	320	135
Hawaii	46	13	38	14	Rhode Island	26	8	19	7
Idaho	226	121	80	47	South Carolina	166	68	78	67
Illinois	872	125	287	158	South Dakota	157	74	68	74
Indiana	599	115	171	117	Tennessee	261	83	152	84
Iowa	306	124	177	134	Texas	1,717	385	840	421
Kansas	387	146	139	128	Utah	126	47	85	45
Kentucky	174	65	106	58	Vermont	73	16	17	11
Louisiana	437	85	252	77	Virginia	368	68	159	84
Maine	150	64	51	33	Washington	438	135	219	135
Maryland	200	35	77	46	West Virginia	104	40	64	32
Massachusetts	224	48	121	41	Wisconsin	484	134	177	139
Michigan	469	229	194	185	Wyoming	104	41	53	37
Minnesota	476	158	147	139	**50 States—Total**	18,268	5,316	8,198	4,808
Mississippi	226	83	127	82	Puerto Rico	32	11	28	10
Missouri	505	139	229	137	Virgin Islands	9	2	3	2
Montana	243	122	106	87	S. Pacific[c]	36	28	19	12
Nebraska	295	93	114	92	**TOTAL**	18,345	5,357	8,248	4,832

FACILITIES BY CLASS

Class	Total[a]	Public[b]	Private
Airports	13,192	5,075	8,117
Heliports	4,626	85	4,541
Stolports	86	4	82
Seaplane Bases	441	193	248
Total Facilities	18,345	5,357	12,988

Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Annually).

a Included in these data are facilities having joint civil-military use.

b "Public" refers to use, whether publicly or privately owned.

c American Samoa, Guam, and Trust Territories.

HELIPORTS/HELIPADS[a] IN THE UNITED STATES BY STATE

As of 1997

State	Total Helipads in State	Private Use		Public Use	
		Heliports & Helistops	Helipads at Airports	Heliports & Helistops	Helipads at Airports
Alabama	70	69	—	—	1
Alaska	26	16	1	6	3
Arizona	95	91	1	—	3
Arkansas	78	75	1	—	2
California	401	382	3	—	16
Colorado	162	159	—	—	3
Connecticut	79	73	1	2	3
Delaware	12	10	—	1	1
District of Columbia	19	19	—	—	—
Florida	252	249	1	1	1
Georgia	100	98	—	—	2
Hawaii	18	16	—	—	2
Idaho	35	33	1	—	1
Illinois	236	223	3	10	—
Indiana	114	108	3	2	1
Iowa	82	80	—	1	1
Kansas	33	29	—	—	4
Kentucky	48	48	—	—	—
Louisiana	217	210	2	4	1
Maine	16	15	—	—	1
Maryland	55	53	1	—	1
Massachusetts	132	127	—	2	3
Michigan	80	77	1	2	—
Minnesota	42	38	—	—	4
Mississippi	45	45	—	—	—
Missouri	120	115	1	3	1
Montana	23	20	—	3	—
Nebraska	30	28	1	—	1
Nevada	25	24	—	—	1
New Hampshire	42	41	—	—	1

(Continued on next page)

HELIPORTS/HELIPADS[a] IN THE UNITED STATES BY STATE (Continued)

As of 1997

State	Total Helipads in State	Private Use		Public Use	
		Heliports & Helistops	Helipads at Airports	Heliports & Helistops	Helipads at Airports
New Jersey	232	226	—	3	3
New Mexico	22	20	1	1	—
New York	146	131	—	8	7
North Carolina	62	59	—	3	—
North Dakota	14	13	—	—	1
Ohio	205	186	1	15	3
Oklahoma	88	84	—	4	—
Oregon	94	90	2	2	—
Pennsylvania	289	278	1	7	3
Rhode Island	16	15	—	1	—
South Carolina	26	24	—	—	2
South Dakota	13	13	—	—	—
Tennessee	87	83	2	1	1
Texas	413	398	3	5	7
Utah	40	38	—	—	2
Vermont	17	17	—	—	—
Virginia	116	112	—	—	4
Washington	117	109	3	1	4
West Virginia	31	28	—	—	3
Wisconsin	69	68	—	—	1
Wyoming	18	17	—	—	1
Total U.S.	4,802	4,580	34	88	100

Source: Helicopter Association International, "1998 Helicopter Annual" (Annually).
NOTE: 96.1 percent of all U.S. helicopter landing areas are private, while 3.9 percent are public.
a Excludes temporary heliports, offshore heliports, and infrequently used helicopter landing sites.

ACTIVE U.S. CIVIL AIRCRAFT[a]

As of December 31, 1963–1996
(in thousands)

Year	TOTAL	Air Carrier[b]	General Aviation Aircraft					
			TOTAL	Fixed-Wing Aircraft			Rotor-craft[c]	Other[d]
				Multi-Engine	Single-Engine			
					4-place & over	3-place & less		
1963	87.2	2.079	85.1	9.7	42.6	31.0	1.2	0.6
1964	90.8	2.057	88.7	10.6	45.8	30.4	1.3	0.6
1965	97.6	2.125	95.4	12.0	49.8	31.4	1.5	0.8
1966	107.0	2.272	104.7	13.5	53.0	35.7	1.6	0.9
1967	116.6	2.452	114.2	14.7	56.9	39.7	1.9	1.1
1968	126.8	2.586	124.2	16.8	61.0	42.8	2.4	1.3
1969	133.5	2.690	130.8	18.1	63.7	45.0	2.6	1.4
1970	134.4	2.679	131.7	18.3	64.8	44.9	2.3	1.6
1971	133.8	2.642	131.1	17.9	64.5	44.8	2.4	1.7
1972	147.6	2.583	145.0	19.8	71.0	49.4	2.8	1.9
1973	156.1	2.599	153.5	21.9	74.8	51.4	3.1	2.3
1974	164.0	2.472	161.5	23.4	78.9	53.0	3.6	2.5
1975	171.0	2.495	168.5	24.6	82.6	54.4	4.1	2.8
1976	180.8	2.492	178.3	25.7	88.2	56.7	4.5	3.2
1977	186.8	2.473	184.3	26.7	92.0	57.3	4.7	3.6
1978	201.3	2.545	198.8	28.8	101.5	59.2	5.3	4.0
1979	213.9	3.609	210.3	31.3	106.0	62.4	5.9	4.8
1980	214.9	3.808	211.0	31.7	107.9	60.5	6.0	4.9
1981	217.2	3.973	213.2	33.3	108.0	59.9	7.0	5.0
1982	213.9	4.027	209.8	34.2	106.5	57.7	6.2	6.2
1983	217.5	4.203	213.3	34.6	107.1	59.1	6.5	5.9
1984	225.3	4.370	220.9	35.6	109.9	62.0	7.1	6.3
1985	201.2	4.678	196.5	31.3	98.5	54.9	6.0	5.8
1986	210.2	4.909	205.3	32.0	102.0	58.3	6.5	6.5
1987	208.0	5.253	202.7	30.8	100.4	59.3	5.9	6.3
1988	201.9	5.660	196.2	30.1	98.1	55.6	6.0	6.4
1989	210.8	5.778	205.0	31.9	100.5	58.4	7.0	7.2
1990	204.1	6.083	198.0	30.5	97.6	56.4	6.9	6.6
1991[r]	202.9	6.054	196.9	29.7	97.8	55.1	6.2	8.1
1992[r]	193.0	7.320	185.7	26.8	91.6	53.2	6.0	8.0
1993[r]	184.4	7.297	177.1	22.8	91.6	42.5	4.7	15.5
1994[r]	180.3	7.370	172.9	22.3	87.3	40.5	4.7	18.1
1995[r]	190.0	7.411	182.6	23.7	91.2	42.8	5.6	19.3
1996	194.8	7.478	187.3	24.6	92.7	43.2	6.4	20.3

Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Annually).

a "Active aircraft" must have a current U.S. registration and have flown during the calendar year. Prior to 1971, only a current U.S. registration was necessary.

b Effective 1978, includes certificated route air carriers, supplemental air carriers (charters), multi-engine aircraft in commuter passenger service, and all aircraft over 12,500 pounds operated by air taxis, commercial operators, and travel clubs.

c Includes autogiros; excludes air carrier helicopters.

d Includes gliders, dirigibles, balloons, and experimental aircraft.

r Revised.

ACTIVE U.S. CIVIL AIRCRAFT BY PRIMARY USE AND TYPE OF AIRCRAFT

As of December 31, 1996

Primary Use[a]	TOTAL	Fixed-Wing			Rotor-craft[b]	Other[c]
		Turbojet	Turboprop	Piston		
TOTAL—ALL AIRCRAFT ...	194,790	9,209	7,013	151,711	6,512	20,342
Air Carrier—TOTAL	7,478	4,922	1,704	731	121	—
Large	5,757	4,916	788	53	—	—
Small	1,721	6	916	678	121	—
General Aviation—TOTAL	187,312	4,287	5,309	150,980	6,391	20,342
Executive.....	9,286	3,350	2,327	2,549	868	189
Business	28,236	211	708	26,043	463	809
Air Taxi[d]	3,838	393	743	2,057	500	143
Instructional	14,261	25	73	13,149	487	525
Personal	109,619	94	364	92,715	482	15,962
Aerial Application	5,361	—	377	4,275	510	197
Aerial Observation.....	3,225	—	38	2,481	633	72
Sight Seeing	889	—	—	408	204	276
Air Tours	125	—	—	67	54	3
External Load	424	—	—	—	357	66
Public Use	4,206	89	451	2,285	1,324	54
Other Work	1,118	—	68	851	102	96
Other	6,718	122	156	4,094	402	1,942

Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Annually) and General Aviation Manufacturers Association, "General Aviation Statistical Databook" (Annually).

NOTE: Detail may not add to totals because of estimating procedures.

a Definitions of "primary use" categories available in Glossary of "FAA Statistical Handbook."

b Includes helicopters and autogiros.

c Includes gliders, dirigibles, and balloons.

d Limited to Air taxis under 12,500 pounds. Otherwise, aircraft included in "Air Carrier."

U.S. GENERAL AVIATION
TYPE OF AIRCRAFT AND HOURS FLOWN
Calendar Years 1992–1996

	1992[r]	1993[ar]	1994[r]	1995[r]	1996
Number of Active Aircraft by Type (in thousands)					
All Aircraft—TOTAL	185.7	177.1	172.9	182.6	187.3
Fixed-Wing:	171.7	156.9	150.2	157.7	160.6
Piston:	162.9	149.2	142.2	148.7	151.0
Single-Engine	144.8	133.5	127.4	133.4	135.2
Twin-Engine	18.0	15.6	14.8	15.3	15.7
Other	0.1	0.0	0.1	0.0	0.1
Turboprop:	4.8	4.1	4.1	4.5	5.3
Twin-Engine	4.2	3.4	3.6	3.9	4.6
Other	0.6	0.7	0.5	0.7	0.8
Turbojet:	4.0	3.7	3.9	4.4	4.3
Twin-Engine	3.7	3.4	3.7	4.0	4.0
Other	0.3	0.2	0.3	0.5	0.3
Rotorcraft:	6.0	4.7	4.7	5.6	6.4
Piston	2.3	1.8	1.6	1.8	2.4
Turbine	3.6	2.9	3.1	3.8	4.0
Balloons, Dirigibles, and Gliders	8.0	5.0	5.9	4.5	4.1
Experimental	NA	10.4	12.1	14.8	16.2
Hours Flown by Type of Aircraft (in thousands)					
All Aircraft—TOTAL	26,747	24,455	24,092	25,667	26,100
Fixed-Wing: Piston	21,417	19,321	18,823	19,451	19,692
Turboprop	1,582	1,192	1,142	1,447	1,564
Turbojet	1,076	1,121	1,238	1,342	1,463
Rotorcraft: Piston	423	391	369	333	574
Turbine	1,842	1,308	1,408	1,591	1,452
Balloons, Dirigibles, and Gliders	407	338	388	258	217
Experimental	NA	785	724	1,244	1,137
Average Hours Flown Annually by Type					
All Aircraft—TOTAL	144.1	138.1	139.3	140.6	139.3
Fixed-Wing: Piston	131.5	129.5	132.4	130.8	130.4
Turboprop	330.5	289.5	279.0	318.8	294.6
Turbojet	268.7	306.1	316.3	302.1	341.3
Rotorcraft: Piston	180.1	211.7	226.6	184.4	237.5
Turbine	507.2	454.9	454.1	415.5	365.2
Balloons, Dirigibles, and Gliders	50.9	67.2	65.8	57.3	52.3
Experimental	NA	75.3	59.6	84.2	70.2

Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Annually) and the Federal Aviation Administration, Office of Management Systems.
NOTE: Detail may not add to totals because of rounding and/or estimating proce es.
a Beginning in 1993, commuters were excluded from the survey.
NA Not available.
r Revised.

U.S. GENERAL AVIATION
ACTIVE AIRCRAFT AND HOURS FLOWN
BY PRIMARY USE

Calendar Years 1992–1996

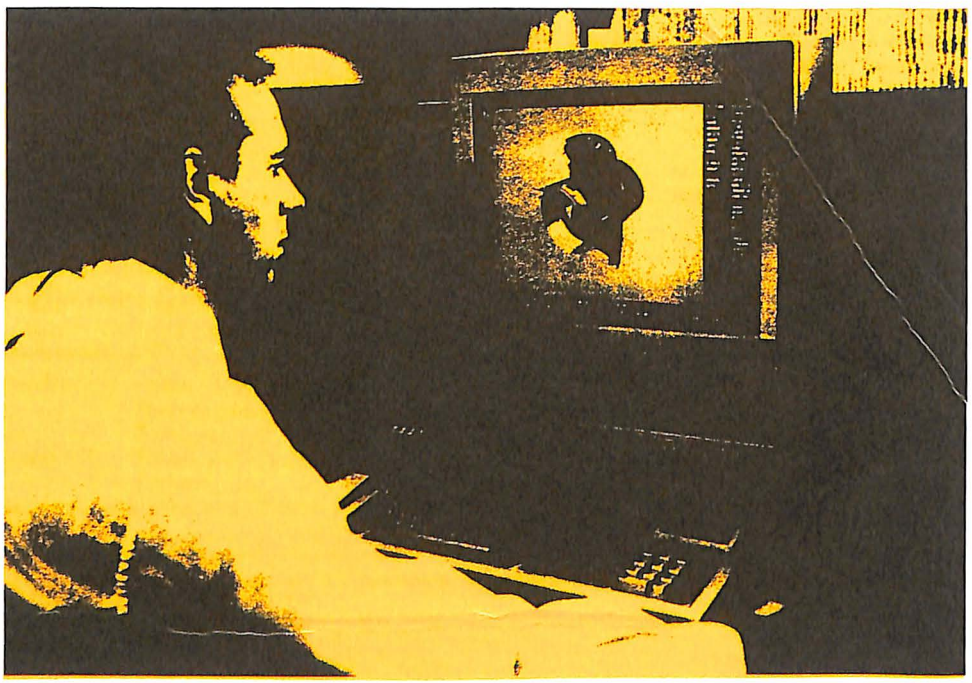
Primary Use[a]	1992[r]	1993[r]	1994[r]	1995[r]	1996
ACTIVE AIRCRAFT AS OF DECEMBER 31 (in thousands)					
TOTAL	186.5	177.1	172.9	182.6	187.3
Executive	9.4	9.9	9.4	9.8	9.3
Business	29.0	28.6	26.5	26.2	28.2
Commuter[b]	0.8	(c)	(c)	(c)	(c)
Air Taxi[b]	4.6	3.5	3.8	3.8	3.8
Instructional	16.1	14.5	15.0	14.8	14.3
Personal	109.6	104.9	102.5	109.3	109.6
Aerial Application	5.1	5.0	4.3	5.1	5.4
Aerial Observation	5.7	4.5	5.1	4.7	3.2
Sight Seeing	NA	1.3	1.3	0.9	0.9
Public Use	NA	NA	NA	NA	4.2
Air Tours	NA	NA	NA	0.3	0.1
External Load	NA	0.1	0.1	0.2	0.4
Other Work	1.7	1.0	1.2	1.1	1.1
Other	3.6	3.9	4.2	6.3	6.7
HOURS FLOWN (in thousands)					
TOTAL	27,471	24,455	24,092	25,667	26,100
Executive	2,251	2,635	2,486	2,869	2,718
Business	3,483	3,350	3,012	3,191	3,152
Commuter[b]	724	(c)	(c)	(c)	(c)
Air Taxi[b]	1,967	1,334	1,545	1,372	1,703
Instructional	5,485	4,626	4,382	4,106	4,425
Personal	8,682	8,202	8,248	9,320	8,893
Aerial Application	1,370	1,283	1,364	1,557	1,787
Aerial Observation	1,736	1,627	1,746	1,385	1,036
Sight Seeing	NA	325	309	206	186
Air Tours	NA	NA	NA	155	70
Public Use	NA	NA	NA	NA	1,021
External Load	NA	83	135	118	203
Other Work	348	180	241	268	262
Other	364	603	622	1,121	644

Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Annually).
NOTE: Detail may not add to totals because of rounding and estimating procedures.
a Definitions of "primary use" categories available in Glossary of "FAA Statistical Handbook."
b Limited to single-engine commuters or air taxis under 12,500 pounds.
c Beginning in 1993, commuters were excluded from the survey.
NA Not available.
r Revised.

FEDERAL OUTLAYS FOR R&D rose slightly in FY 1998, marking the second consecutive increase of significance. These successive increases followed a period of level funding during FY 1993 to FY 1996, according to data supplied by the Office of Management and Budget (OMB). In current dollar outlays, R&D spending rose to $71.4 billion (up from $71.1 billion), technically marking another record year. However, when measured in inflation-adjusted constant dollars, outlays actually declined by 1.4%.

OMB estimates FY 1999 R&D outlays will rise to $74 billion, which represents a 1.2% increase in constant dollar terms. The federal R&D plan allocates half of the total ($37 billion) to DoD. NASA funding is estimated at $9.3 billion, and the Department of Energy at $6.1 billion. The estimate for the "other" category—the National Science Foundation, National Institutes of Health, and the Departments of Transportation and Agriculture—is $21.7 billion.

R&D funding from all sources for calendar year 1997 amounted to $206 billion, up from $196 billion



the previous year, according to the annual survey of the National Science Foundation (NSF). Almost 64% of the total was funded by U.S. industry ($131 billion). Federal funding ($65 billion) accounted for nearly 32%; colleges and universities ($4.7 billion), 2.3%; and nonprofit institutions ($3.3 billion), 1.6%. More than 74% of the R&D in the U.S. was performed by industry.

For 1998, NSF estimated that total R&D funding would amount to $221 billion and that industry would once again be the principal funding source (65%) and principal performer (75%).

In 1996 (the latest year for which NSF data were available by industry), aerospace industry-performed R&D totaled to $16.2 billion, a decrease of 4.3% from the previous year's level. Aerospace R&D funding is sourced from federal agencies ($10.5 billion), which represents 65%, and industry investment, which totaled $5.7 billion. The $16.2 billion represented 11% of the R&D funding available to all U.S. industries in 1996.

According to the NSF survey, aerospace industry continues to conduct more R&D (as a percentage of net sales) than the average for all U.S. manufacturing industries. In 1996, aerospace R&D (federal and company funds) amounted to 12.9% of net sales, the same as the previous year; that compares with the all-manufacturing industry average of 4.0% in 1996. Aerospace company funding, as a percentage of net sales, was 4.5%; the all-manufacturing industry average was 3.3%.

In FY 1997, DoD prime contract awards for RDT&E totaled $20 billion, down for the fourth consecutive year. Of that total, the largest dollar outlays went to missile and space systems RDT&E, $4.9 billion (down slightly from $5 billion). After three years in the lead, aircraft RDT&E slipped to second place, at $4.3 billion (down from $5.4 billion). Electronics and communications equipment RDT&E rose to $3.6 billion (up from $2.9 billion). All other categories combined rose slightly to $7.1 billion.

In a geographical breakdown of FY 1997 DoD awards for RDT&E to business firms, the South Atlantic region marked its fourth year at the head of the list, with contracts totaling $5.4 billion. In second place was the Pacific region ($4.2 billion), followed by the New England ($1.5 billion) and Mountain ($1.4 billion) regions.

TOTAL U.S. FUNDS FOR RESEARCH AND DEVELOPMENT BY SOURCE AND PERFORMER[a]

Calendar Years 1995–1998
(Millions of Dollars)

Source of Funds	TOTAL, All Performers	Performer: Federal Government	Industry	Colleges & Universities	Federally-Funded Research & Development Centers	Non-Profit Institutions
1995[r]						
All Sources—TOTAL	$183,045	$17,133	$132,103	$22,406	$5,388	$6,015
Federal Government	63,102	17,133	23,451	13,470	5,388	3,660
Gov't, Non-Federal	1,692	—	—	1,692	—	—
Industry	110,985	—	108,652	1,506	—	827
Colleges & Universities	4,112	—	—	4,112	—	—
Nonprofit Institutions	3,152	—	—	1,626	—	1,528
1996						
All Sources—TOTAL	$196,011	$16,574	$144,667	$23,280	$5,362	$6,128
Federal Government	63,216	16,574	23,653	13,962	5,362	3,665
Gov't, Non-Federal	1,730	—	—	1,730	—	—
Industry	123,520	—	121,015	1,604	—	901
Colleges & Universities	4,322	—	—	4,322	—	—
Nonprofit Institutions	3,225	—	—	1,663	—	1,562
1997[p]						
All Sources—TOTAL	$205,561	$16,585	$152,710	$24,438	$5,459	$6,371
Federal Government	64,866	16,585	24,434	14,582	5,459	3,806
Gov't, Non-Federal	1,764	—	—	1,764	—	—
Industry	130,953	—	128,276	1,717	—	960
Colleges & Universities	4,667	—	—	4,667	—	—
Nonprofit Institutions	3,313	—	—	1,708	—	1,605
1998[E]						
All Sources—TOTAL	$220,617	$16,936	$165,746	$25,672	$5,529	$6,735
Federal Government	66,637	16,936	24,899	15,247	5,529	4,026
Gov't, Non-Federal	1,845	—	—	1,845	—	—
Industry	143,714	—	140,847	1,829	—	1,038
Colleges & Universities	4,974	—	—	4,974	—	—
Nonprofit Institutions	3,449	—	—	1,778	—	1,671

Source: National Science Foundation, "Annual Survey of Industrial Research and Development" (Annually).
a Source/performer detail not available by industry.
E Estimate.
p Preliminary.
r Revised.

FUNDS FOR INDUSTRIAL RESEARCH AND DEVELOPMENT ALL INDUSTRIES AND THE AEROSPACE INDUSTRY

By Funding Source
Calendar Years 1982–1996
(Millions of Dollars)

Year	All Industries[a]			Aerospace Industry[b]		
	Total	Federal Funds	Company Funds[c]	Total	Federal Funds	Company Funds[c]
CURRENT DOLLARS						
1982	$ 58,650	$18,545	$ 40,105	$14,451	$10,265	$4,186
1983	65,268	20,680	44,588	15,406	11,396	4,010
1984	74,800	23,396	51,404	18,858	14,094	4,764
1985	84,239	27,196	57,043	22,231	16,582	5,649
1986	87,823	27,891	59,932	21,050	14,984	6,066
1987	92,155	30,752	61,403	24,458	18,519	5,939
1988	97,015	30,343	66,672	24,168	18,402	5,766
1989	102,055	28,554	73,501	22,331	16,828	5,503
1990	109,727	28,125	81,602	20,635	15,248	5,387
1991	116,952	26,372	90,580	16,629	11,096	5,533
1992	119,110	24,722	94,388	17,158	10,287	6,871
1993	117,400	22,809	94,591	15,056	9,372	5,684
1994	119,595	22,463	97,131	14,260	8,794	5,466
1995	132,103	23,451	108,652	16,951	11,462	5,489
1996	144,667	23,653	121,015	16,224	10,515	5,710
CONSTANT DOLLARS[dr]						
1982	$ 83,571	$26,425	$ 57,146	$20,591	$14,627	$5,965
1983	89,213	28,267	60,946	21,058	15,577	5,481
1984	98,525	30,817	67,708	24,839	18,564	6,275
1985	107,270	34,631	72,638	28,309	21,115	7,193
1986	108,989	34,613	74,376	26,123	18,595	7,528
1987	110,950	37,024	73,926	29,446	22,296	7,150
1988	112,677	35,242	77,436	28,070	21,373	6,697
1989	113,748	31,826	81,923	24,890	18,756	6,134
1990	117,180	30,035	87,144	22,037	16,284	5,753
1991	120,173	27,098	93,074	17,087	11,402	5,685
1992	119,110	24,722	94,388	17,158	10,287	6,871
1993	114,380	22,222	92,158	14,669	9,131	5,538
1994	113,802	21,375	92,426	13,569	8,368	5,201
1995	122,590	21,762	100,828	15,730	10,637	5,094
1996	131,253	21,460	109,794	14,720	9,540	5,181

Source: National Science Foundation, "Annual Survey of Industrial Research and Development" (Annually).
NOTE: Detail may not add to totals because of rounding.

a Includes all manufacturing industries, plus those non-manufacturing industries known to conduct or finance research and development.

b Companies classified in SIC codes 372 and 376, having as their principal activity the manufacture of aircraft, guided missiles, space vehicles, and parts.

c Company funds include all funds for industrial R&D work performed within company facilities except funds provided by the Federal Government. Excluded are company-financed research and development contracted to outside organizations such as research institutions, universities and colleges, or other non-profit organizations.

d Based on GDP deflator, 1992=100.

r Revised.

FUNDS FOR INDUSTRIAL RESEARCH AND DEVELOPMENT IN THE AEROSPACE INDUSTRY

By Type of Research and Funding Source
Calendar Years 1964–1996
(Millions of Dollars)

Year	TOTAL AEROSPACE	Basic Research			Applied Research			Development		
		Total	Federal Funds	Company Funds	Total	Federal Funds	Company Funds	Total	Federal Funds	Company Funds
1964	$ 5,078	$ 67	$ 34	$ 28	$ 766	$ 607	$ 159	$ 4,244	$ 3,948	$ 296
1965	5,148	71	41	30	735	563	172	4,342	3,921	421
1966	5,526	69	36	33	773	563	210	4,685	4,162	523
1967	5,669	71	33	38	726	490	236	4,871	4,071	800
1968	5,765	68	26	42	677	426	251	5,021	4,145	876
1969	5,882	65	24	41	597	347	250	5,220	4,216	1,004
1970	5,219	63	20	43	565	352	213	4,591	3,718	873
1971	4,881	54	37	17	461	279	182	4,365	3,583	782
1972	4,950	60	44	16	451	267	184	4,438	3,722	716
1973	5,052	50	21	29	512	308	204	4,491	3,633	858
1974	5,278	51	19	32	609	360	249	4,617	3,735	882
1975	5,713	54	17	37	614	381	233	5,044	4,119	925
1976	6,339	54	21	33	666	365	301	5,619	4,521	1,098
1977	7,033	56	25	31	753	419	334	6,223	5,017	1,206
1979[a]	8,041	86	44	42	880	499	381	7,076	5,314	1,762
1981[a]	11,968	131	60	71	1,484	897	587	10,353	7,738	2,615
1983	13,853	146	NA	NA	3,466	NA	NA	10,241	7,668	2,573
1984	16,033	247	NA	NA	3,067	NA	NA	12,718	9,870	2,848
1985	17,619	304	162	142	3,785	2,776	1,009	13,530	10,483	3,047
1986	21,050	311	208	103	3,198	1,571	1,627	17,541	13,205	4,336
1987	24,488	425	335	90	2,949	1,709	1,239	21,115	16,475	4,640
1988	25,900	366	263	104	2,997	1,915	1,082	22,537	17,700	4,838
1989	25,638	668	553	116	3,081	2,113	968	21,889	16,967	4,921
1990	25,356	658	519	139	3,340	1,931	1,409	21,358	16,766	4,592
1991	16,983	364	302	62	2,091	1,105	986	14,528	10,043[b]	4,485
1992	17,158	270	235	35	1,739	976	763	15,148	9,076	6,072
1993	15,056	NA	NA	NA	1,453	825	628	NA	NA	NA
1994	14,260	NA	NA	NA	NA	NA	NA	12,787	7,978	4,809
1995	16,951	252	250	2	1,987	564	1,423	14,712	10,648	4,064
1996	16,224	NA	NA	NA	NA	NA	NA	13,259	9,264	3,995

Source: National Science Foundation, "Annual Survey of Industrial Research and Development" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Break-outs by Research Type and Funding Source available only for odd-numbered years between 1977 and 1983.
b Computed by AIA as difference between total and company funds. Figure withheld by NSF because of imputation of more than 50 percent.
NA Not available.

RESEARCH AND DEVELOPMENT FUNDS AS PERCENT OF NET SALES ALL MANUFACTURING INDUSTRIES AND THE AEROSPACE INDUSTRY

Calendar Years 1978–1996

Year	All Manufacturing Industries[a]		Aerospace Industry[b]	
	Total Funds	Company Funds	Total Funds	Company Funds
1978	2.9%	2.0%	13.3%	3.2%
1979	2.6	1.9	12.9	3.5
1980	3.0	2.1	13.7	3.8
1981	3.1	2.2	16.0	4.6
1982	3.8	2.6	17.1	5.1
1983	3.9	2.6	15.2	4.1
1984	3.9	2.6	15.4	4.0
1985	4.4	3.0	14.9	3.9
1986	4.7	3.2	13.4	4.0
1987	4.6	3.1	14.7	3.6
1988	4.5	3.1	16.3	3.9
1989	4.3	3.1	13.5	3.3
1990	4.2	3.1	11.8	3.1
1991	4.2	3.2	12.1	4.0
1992	4.2	3.3	11.8	4.7
1993	3.8	3.1	12.5	4.7
1994	3.6	2.9	13.8	5.3
1995	3.6	2.9	12.9	4.2
1996	4.0	3.3	12.9	4.5

Source: National Science Foundation, "Annual Survey of Industrial Research and Development" (Annually).

a Includes all manufacturing industries known to conduct or finance research and development.

b Companies classified in SIC codes 372 and 376, having as their principal activity the manufacture of aircraft, guided missiles, space vehicles, and parts.

FEDERAL OUTLAYS FOR CONDUCT OF RESEARCH AND DEVELOPMENT

Fiscal Years 1985–1999
(Millions of Dollars)

Year	TOTAL	DoD	NASA	Energy[a]	Other[b]
CURRENT DOLLARS					
1985	$47,216	$28,165	$2,969	$6,954	$ 9,128
1986	52,141	33,396	3,431	5,392	9,922
1987	53,256	34,732	3,250	5,262	10,012
1988	56,100	35,605	3,832	5,332	11,331
1989	60,760	37,819	4,975	5,681	12,285
1990	63,810	38,247	6,325	5,957	13,281
1991	62,183	35,330	7,072	5,892	13,889
1992	64,728	35,504	7,617	6,043	15,564
1993	68,378	37,666	8,088	6,036	16,588
1994	68,453	35,474	7,878	5,904	19,197
1995	68,432	35,356	8,992	6,195	17,889
1996	68,439[r]	36,936	8,083	6,135	17,285[r]
1997	71,073	37,702	9,374	5,819	18,178
1998[E]	71,379	36,446	9,399	5,543	19,991
1999[E]	73,704	36,593	9,250	6,131	21,730
CONSTANT DOLLARS[cr]					
1985	$60,248	$35,938	$3,788	$8,873	$11,647
1986	64,691	41,434	4,257	6,690	12,310
1987	64,218	41,881	3,919	6,345	12,073
1988	65,377	41,493	4,466	6,214	13,205
1989	67,934	42,284	5,562	6,352	13,735
1990	68,502	41,060	6,790	6,395	14,258
1991	64,007	36,366	7,279	6,065	14,296
1992	64,728	35,504	7,617	6,043	15,564
1993	66,619	36,697	7,880	5,881	16,161
1994	65,119	33,746	7,494	5,616	18,262
1995	63,469	32,792	8,340	5,746	16,592
1996	62,042	33,484	7,328	5,562	15,669
1997	63,042	33,442	8,315	5,161	16,124
1998[E]	62,134	31,725	8,182	4,825	17,402
1999[E]	62,887	31,223	7,892	5,231	18,541

Source: Office of Management and Budget, "The Budget of the United States Government" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Includes defense and nondefense-related atomic energy R&D with nondefense energy R&D.
b Includes but not limited to NSF, NIH, DoT, & Agriculture.
c Based on Fiscal Year GDP deflator, 1992=100.
E Estimate. Latest year reflects Administration's budget proposal.
r Revised.

FEDERAL AERONAUTICS RESEARCH AND DEVELOPMENT

Fiscal Years 1982–1997
(Millions of Dollars)

Year	TOTAL	NASA[a]	DoD[b]	DoT[c]
BUDGET AUTHORITY				
1982	$ 3,581	$ 516	$2,984	$ 81
1983	3,871	547	3,221	103
1984	4,087	600	3,224	263
1985	4,335	648	3,422	265
1986	6,660	601	4,927	1,132
1987	5,824	698	4,179	946
1988	6,974	723	4,989	1,262
1989	10,656	872	8,240	1,544
1990	10,690	932	7,867	1,891
1991	9,417	968	6,149	2,300
1992	11,110	1,117	7,366	2,627
1993	11,359	1,245	7,582	2,532
1994	10,703	1,546	6,848	2,309
1995	10,718	1,310	7,196	2,212
1996	10,159	1,315	6,792	2,052
1997[E]	9,721	1,252	6,323	2,146
OUTLAYS				
1982[d]	$ 3,309	$ 563	$2,657	$ 89
1983	3,817	563	2,920	334
1984	4,005	586	2,995	424
1985	4,435	643	3,101	691
1986	6,073	648	4,373	1,052
1987	5,867	622	4,182	1,063
1988	6,340	679	4,448	1,213
1989	8,491	855	6,420	1,216
1990	10,009	889	7,649	1,471
1991	9,501	1,017	6,793	1,691
1992	10,011	1,122	6,790	2,099
1993	11,162	1,212	7,572	2,378
1994	11,137	1,330	7,203	2,604
1995	11,155	1,153	7,132	2,870
1996	10,837	1,187	6,974	2,676
1997[E]	10,430	1,302	6,600	2,528

Source: NASA, "Aeronautics and Space Report of the President" (Annually).
a Research and Development, Construction of Facilities, Research and Program Management.
b Research, Development, Test, and Evaluation of aircraft and related equipment.
c Federal Aviation Administration: Research, Engineering, and Development; and Facilities, Engineering, and Development.
d First year outlays data available.
E Estimate.

DEPARTMENT OF DEFENSE
OUTLAYS FOR RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
Fiscal Years 1972–1999
(Millions of Dollars)

Year	TOTAL, All RDT&E Functions	Air Force	Navy	Army	Other
1972	$ 7,881	$ 3,205	$2,427	$1,779	$ 470
1973	8,157	3,362	2,404	1,912	479
1974	8,582	3,240	2,623	2,190	529
1975	8,866	3,308	3,021	1,964	573
1976	8,923	3,338	3,215	1,842	528
Tr.Qtr.	2,203	830	778	437	161
1977	9,795	3,618	3,481	2,069	627
1978	10,508	3,626	3,825	2,342	715
1979	11,152	4,080	3,826	2,409	837
1980	13,127	5,017	4,381[r]	2,707	1,021
1981	15,278	6,341	4,783	2,958	1,196
1982	17,729	7,794	5,240	3,230	1,465
1983	20,554	9,182	5,854	3,658	1,861
1984	23,117	10,353	6,662	3,812	2,289
1985	27,103	11,573	8,054	3,950	3,527
1986	32,283	13,417	9,667	3,984	5,215
1987	33,596	13,347	9,176	4,721	6,352
1988	34,792	14,302	8,828	4,624	7,038
1989	37,002	14,912	9,291	4,966	7,833
1990	37,458	14,443	9,160	5,513	8,342
1991	34,589	13,050	7,586	5,559	8,371
1992	34,632	11,998	7,826	5,978	8,830
1993	36,968[r]	12,338	8,944	6,218	9,467
1994	34,786	12,513	7,990	5,746	8,537
1995[r]	34,710	12,052	9,230	5,081	8,347
1996	36,561[r]	13,056	9,404	4,925	9,175
1997	37,027	14,040	8,220	4,859	9,908
1998[E]	35,770	13,931	7,625	4,965	9,249
1999[E]	35,913	13,508	7,974	4,894	9,537

Source: Office of Management and Budget, "The Budget of the United States Government" (Annually).
E Estimate. Latest year reflects Administration's budget proposal.
r Revised.
Tr.Qtr. See Glossary.

DEPARTMENT OF DEFENSE
APPROPRIATIONS FOR
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

Fiscal Years 1997–1999
(Millions of Dollars)

	1997	1998[E]	1999[E]
TOTAL—APPROPRIATIONS FOR RDT&E	$36,503	$36,659	$36,079
BY APPROPRIATION			
Army	$ 4,916	$ 5,025	$ 4,781
Navy	7,884	7,880	8,109
Air Force	14,090	13,982	13,598
Defense Agencies	9,313	9,496	9,315
Director of Test & Evaluation, Defense	276	246	251
Director of Operational Test & Evaluation	24	30	25
RECAP OF BUDGET ACTIVITIES			
Basic Research	$ 1,032	$ 1,042	$ 1,111
Applied Research	2,822	2,996	3,020
Advanced Technology Development	3,639	3,762	3,050
Demonstration and Validation	5,864	6,396	6,516
Engineering & Manufacturing Development	8,536	8,199	7,987
RDT&E Management Support	3,465	3,199	2,771
Operational Systems Development	11,145	11,064	11,624
RECAP OF FYDP PROGRAMS			
Strategic Forces	$ 115	$ 130	$ 225
General Purpose Forces	2,899	2,818	2,951
Intelligence and Communications	7,750	7,670	7,768
Mobility Forces	79	121	183
Research and Development (FYDP Program 6)	25,241	25,475	24,464
Central Supply and Maintenance	240	215	278
Training Medical and Other	2	1	—
Administration and Associated Activities	25	39	41
Support of Other Nations	10	38	12
Special Operations Forces	142	153	156

Source: Department of Defense Budget, "RDT&E Programs (R-1)" (Annually).
NOTE: Detail may not add to totals because of rounding.
E Estimate. Latest year reflects Administration's budget proposal.

DEPARTMENT OF DEFENSE
PRIME CONTRACT AWARDS
FOR RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

Fiscal Years 1993–1997
(Millions of Dollars)

Program Categories	1993	1994	1995	1996	1997
TOTAL—RDT&E	$22,292	$21,824	$21,549	$20,277	$19,856
Research	1,377	1,052	1,621	1,603	1,704
Exploratory Development	2,203	2,181	2,331	2,297	1,983
Other Development	17,251	17,468	17,597[a]	16,376[a]	16,168[a]
Management & Support	1,461	1,123	(a)	(a)	(a)
Aircraft—TOTAL	$ 5,114	$ 5,809	$ 5,770	$ 5,419	$ 4,310
Research	13	10	10	129	111
Exploratory Development	86	81	119	112	127
Other Development	4,942	5,615	5,641[a]	5,178[a]	4,072[a]
Management & Support	73	102	(a)	(a)	(a)
Missile and Space Systems—TOTAL	5,871	5,727	5,319	5,023	4,904
Research	339	114	184	210	270
Exploratory Development	456	395	471	493	426
Other Development	5,011	5,160	4,663[a]	4,320[a]	4,208[a]
Management & Support	65	58	(a)	(a)	(a)
Electronics & Communications Equipment—TOTAL	3,914	3,567	3,495	2,875	3,589
Research	158	108	196	221	260
Exploratory Development	337	340	350	351	319
Other Development	3,374	3,069	2,949[a]	2,303[a]	3,011[a]
Management & Support	46	50	(a)	(a)	(a)
All Other—TOTAL[b]	7,392	6,721	6,965	6,960	7,053
Research	867	820	1,231	1,044	1,064
Exploratory Development	1,324	1,365	1,390	1,341	1,111
Other Development	3,924	3,624	4,344[a]	4,575[a]	4,878[a]
Management & Support	1,277	912	(a)	(a)	(a)

Source: Department of Defense, "Prime Contract Awards by Service Category and Federal Supply Classification" (Annually).
NOTE: Detail may not add to totals because of rounding.
a "Management & Support" combined with "Other Development" beginning in FY 1995.
b "All Other" includes ships, tank-automotive, weapons, ammunition, services, and other.

DEPARTMENT OF DEFENSE
NET VALUE OF PRIME CONTRACT AWARDS OVER $25,000 FOR RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

By Region and Type of Contractor
Fiscal Year 1997

REGION	TOTAL	Type of Contractor		
		Educational Institutions	Other Non-Profit Institutions[a]	Business Firms
TOTAL—Millions of Dollars	$19,554	$407	$1,837	$17,310
New England	$ 2,185	$ 32	$ 648	$ 1,505
Middle Atlantic	1,168	62	126	980
East North Central	1,022	44	48	931
West North Central	847	30	4	813
South Atlantic	6,094	84	568	5,442
East South Central	906	12	4	889
West South Central	1,257	24	46	1,187
Mountain	1,443	31	4	1,408
Pacific[b]	4,631	89	388	4,155
PERCENT OF TOTAL	100.0%	100.0%	100.0%	100.0%
New England	11.2%	7.8%	35.3%	8.7%
Middle Atlantic	6.0	15.2	6.9	5.7
East North Central	5.2	10.9	2.6	5.4
West North Central	4.3	7.3	0.2	4.7
South Atlantic	31.2	20.6	30.9	31.4
East South Central	4.6	3.0	0.2	5.1
West South Central	6.4	6.0	2.5	6.9
Mountain	7.4	7.6	0.2	8.1
Pacific[b]	23.7	21.7	21.1	24.0

Source: Department of Defense, "Prime Contract Awards by Region and State" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Includes contracts with other government agencies.
b Includes Alaska and Hawaii.

MISSILE PROGRAMS
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
By Agency and Model
Fiscal Years 1997, 1998, and 1999
(Millions of Dollars[a])

Agency and Model	1997	1998 [E]	1999 [E]
AIR FORCE			
AMRAAM[b]	$ 11.8	$ 45.4	$ 50.0
*JASSM[b]	160.7	129.3	135.0
JDAM[b]	62.9	32.9	23.9
SFW	18.7	16.4	3.6
WCMD	46.1	17.5	7.6
NAVY			
AAWS-M	$ 0.4	$ 0.2	$ 0.2
*AIM-9X Sidewinder[b]	74.5	109.1	118.9
JSOW[b]	104.3	100.0	88.1
RAM	18.8	13.6	4.2
Standard	9.2	0.5	1.3
Tomahawk	138.8	88.8	66.7
Trident II	29.9	39.1	56.6
ARMY			
AAWS-M	$ 5.9	$ 7.8	$ 5.3
ATACMS	72.6	88.6	51.8
BAT	94.8	140.8	83.1
Laser Hellfire	3.7	—	—
MLRS	61.7	36.2	20.2
SADARM	9.7	10.8	20.8
BMD ORGANIZATION			
BMD	$3,360.3	$3,281.7	$3,178.9

Source: Department of Defense Budget, "Program Acquisition Costs by Weapon System" (Annually).
NOTE: See Missile Programs Chapter for missile program procurement authorization data.
a Total Obligational Authority.
b Navy and Air Force funding.
E Estimate. Latest year reflects Administation's budget proposal.
NA Not available.
* Programs in R&D only.

Missile Program Acronyms:

AAWS-M —Advanced Anti-Tank Weapon System-Medium
AMRAAM —Advanced Medium Range Air-to-Air Missile
ATACMS —Army TACtical Missile System
BAT —Brilliant Anti-Tank submunition
BMD —Ballistic Missile Defense
JASSM —Joint Air-to-Surface Standoff Missile
JDAM —Joint Direct Attack Munition
JSOW —Joint Standoff Weapon
MLRS —Multiple Launch Rocket System
RAM —Rolling Airframe Missile
SADARM —Sense And Destroy ARMor
SFW —Sensor Fused Weapon
WCMD —Wind Corrected Munitions Dispenser

MILITARY AIRCRAFT PROGRAMS
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

By Agency and Model
Fiscal Years 1997, 1998, and 1999
(Millions of Dollars[a])

Agency and Model	1997	1998[E]	1999[E]
AIR FORCE			
B-2 Spirit	$ 585.6	$ 335.3	$ 131.2
C-17 Globemaster III	71.4	104.6	123.1
C-130J	—	4.0	—
E-8C JSTARS	206.1	118.3	123.8
F-15E Eagle	152.4	129.8	104.2
F-16 Falcon	125.5	95.3	125.1
F-22 Raptor	1,815.5	1,958.9	1,582.2
JPATS[b]	43.0	55.3	45.0
*YAL-1A	56.0	151.4	292.2
NAVY			
AV-8B Harrier	$ 15.8	$ 10.7	$ 13.8
CH-60	6.9	31.8	12.8
E-2C Hawkeye	60.0	62.5	47.8
EA-6B Prowler	37.5	—	65.4
F/A-18 Hornet	330.8	263.0	260.0
*JSF[b]	565.2	905.0	919.5
V-22 Osprey	605.6	512.1	355.1
ARMY			
Longbow Apache	$ 10.8	$ —	$ —
OH-58D Kiowa Warrior	1.1	—	—
*RAH-66 Comanche	325.3	272.2	367.8
DEFENSE AIRBORNE RECONNAISSANCE OFFICE			
UAVs	$ 432.2	$ 513.2	$ 504.8

Source: Department of Defense Budget, "Program Acquisition Costs by Weapon System" (Annually).
NOTE: See Aircraft Production Chapter for aircraft program procurement authorization data.
a Total Obligational Authority.
b Air Force and Navy funding.
E Estimate. Latest year reflects Administration's budget proposal.
NA Not Available.
* Programs in R&D only.

Foreign Trade

IN 1997, AEROSPACE EXPORTS reached an all-time high, continuing the turnaround that began in 1996 after three years of decline.

Aerospace exports amounted to $50 billion, up a remarkable 25% over the previous year's $40 billion. Aerospace imports (at $18 billion) also increased, growing by 33%, from $13.7 billion in 1996. The aerospace trade balance grew by $5.6 billion (up 21%) to $32 billion.

Aerospace exports constituted 7.3% of all U.S. merchandise exports in 1997, which marked the second straight gain, up from 6.4% in 1996, but still short of the peak years of 1991-92, when aerospace exports topped 10%. Continuing a trend, civil exports accounted for most of the 1997 volume—nearly 80%. The civil export total of $40 billion compares with $29 billion the previous year, a notable gain of 36%.

In terms of dollar value, foreign shipments of airline transports accounted for 52% of the civil export volume, an increase of six percentage points over the corresponding figure for 1996, which was 46%. Overall, exports of transports totaled $21 billion, up from $13.6 billion the previous year. The total for complete civil aircraft, which, in addition to transports, includes general aviation aircraft, helicopters, and used aircraft, was $23 billion (up considerably from the prior year's $15 billion). Aircraft engines accounted for another $2.1 billion of the total civil export volume; and aircraft and engine parts, including spares, amounted to $14.4 billion (up from $12 billion).

The high level of exports also resulted from another year of strong military equipment deliveries, which amounted to $10.3 billion, down only slightly from the $10.8 billion in 1996. Complete military aircraft exports were down to $2.4 billion from $3.9 billion the previous year, caused mainly by a drop in exports of fighter/fighter-bombers, which were down from $3.1 billion in 1996 to $1.8 billion in 1997. However, the aircraft and engine parts category climbed to $5.9 billion from $5.2 billion the previous year. Guided missiles, rockets, and parts amounted to $1.1 billion (only slightly below the $1.2 billion posted in 1996); and aircraft engines rose to $388 million from $274 million the previous year.

The principal customers for U.S. aerospace exports in 1997 were: the United Kingdom ($6.5 billion), Japan ($5.1 billion), Canada ($2.8 billion), France ($2.7 billion), Saudi Arabia ($2.6 billion), Germany ($2.5 billion), South Korea ($2.5 billion),

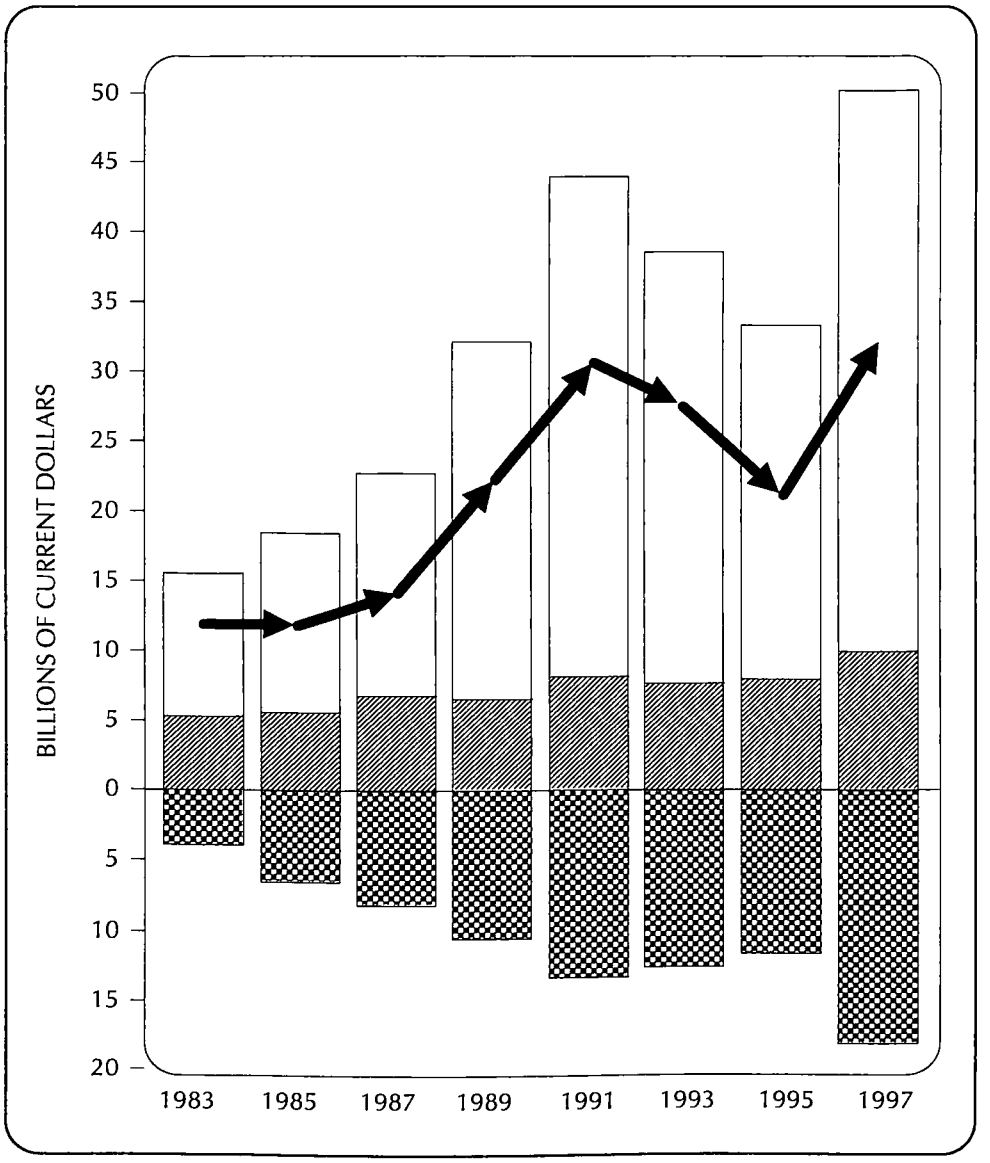
Taiwan ($2.4 billion), China ($2.3 billion), and Singapore ($2.0 billion).

Aerospace imports reached another all-time high at $18 billion (up from $13.7 billion). Civil imports, at $13 billion, accounted for 72% of the total. That total breaks down into complete aircraft, $4.7 billion (up from $3.9 billion); aircraft and engine parts, $6.8 billion (up from $4.9 billion); and aircraft engines, $1.5 billion (up from $1 billion).

Military imports amounted to $5.2 billion, up from $3.8 billion. The aircraft and engine parts category made up the bulk of military imports at $3.6 billion (up from $2.8 billion), while aircraft engines accounted for $1.5 billion of the total (up from $1 billion).

The principal suppliers of aerospace imports were: France ($4.1 billion), United Kingdom ($4.0 billion), Canada ($3.8 billion), Japan ($1.7 billion), and Germany ($1.2 billion).

Aerospace Exports, Imports, and Trade Balance



SOURCE: AEROSPACE INDUSTRIES ASSOCIATION

U.S. TOTAL AND AEROSPACE FOREIGN TRADE[a]

Calendar Years 1964–1997
(Millions of Dollars)

Year	Total U.S. Merchandise Trade			Aerospace		
	Trade Balance	Exports	Imports	Trade Balance	Exports	Imports
1964	$ 7,006	$ 25,690	$ 18,684	$ 1,518	$ 1,608	$ 90
1965	5,334	26,699	21,366	1,459	1,618	159
1966	3,837	29,379	25,542	1,370	1,673	303
1967	4,122	30,934	26,812	1,961	2,248	287
1968	837	34,063	33,226	2,661	2,994	333
1969	1,289	37,332	36,043	2,831	3,138	307
1970	3,225	43,176	39,952	3,097	3,405	308
1971	(1,476)[b]	44,087	45,563	3,830	4,203	373
1972	(5,729)	49,854	55,583	3,230	3,795	565
1973	2,390	71,865	69,476	4,360	5,142	782
1974	(3,884)	99,437	103,321	6,350	7,095	745
1975	9,551	108,856	99,305	7,045	7,792	747
1976	(7,820)	116,794	124,614	7,267	7,843	576
1977	(28,353)	123,182	151,534	6,850	7,581	731
1978	(30,205)	145,847	176,052	9,058	10,001	943
1979	(23,922)	186,363	210,285	10,123	11,747	1,624
1980	(19,696)	225,566	245,262	11,952	15,506	3,554
1981	(22,267)	238,715	260,982	13,134	17,634	4,500
1982	(27,510)	216,442	243,952	11,035	15,603	4,568
1983	(52,409)	205,639	258,048	12,619	16,065	3,446
1984	(106,703)	223,976	330,678	10,082	15,008	4,926
1985	(117,712)	218,815	336,526	12,593	18,725	6,132
1986	(138,279)	227,159	365,438	11,826	19,728	7,902
1987	(152,119)	254,122	406,241	14,575	22,480	7,905
1988	(118,526)	322,426	440,952	17,860	26,947	9,087
1989	(109,399)	363,812	473,211	22,083	32,111	10,028
1990	(101,718)	393,592	495,311	27,282	39,083	11,801
1991	(66,723)	421,730	488,453	30,785	43,788	13,003
1992	(84,501)	448,164	532,665	31,356	45,018	13,662
1993	(115,568)	465,091	580,659	27,235	39,418	12,183
1994	(150,630)	512,626	663,256	25,010	37,373	12,363
1995	(158,703)	584,742	743,445	21,561	33,071	11,509
1996	(170,214)	625,075	795,289	26,602	40,270	13,668
1997	(181,488)	689,182	870,671	32,239	50,374	18,134

Source: Bureau of the Census, Foreign Trade Division and Aerospace Industries Association, based on data from International Trade Administration.

NOTE: The Commerce Department began reporting international trade using the Harmonized Tariff Schedules of the United States in 1989. Previous years based on the Tariff Schedules of the United States Annotated.

a Total U.S. and aerospace foreign trade are reported as (1) exports of domestic merchandise, including Department of Defense shipments and undocumented exports to Canada, f.a.s. (= free alongside ship) basis, (2) imports for consumption, customs value basis.

b First U.S. trade deficit since 1888.

TOTAL U.S. EXPORTS AND EXPORTS OF AEROSPACE PRODUCTS

Calendar Years 1964–1997
(Millions of Dollars)

Year	TOTAL Exports of U.S. Merchandise[a]	Exports of Aerospace Products				
		TOTAL	Percent of Total U.S. Exports	Civil		Military
				Total	Transports	
1964	$ 25,690	$ 1,608	6.3%	$ 764	$ 211	$ 844
1965	26,699	1,618	6.1	854	353	764
1966	29,379	1,673	5.7	1,035	421	638
1967	30,934	2,248	7.3	1,380	611	868
1968	34,063	2,994	8.8	2,289	1,200	705
1969	37,332	3,138	8.4	2,027	947	1,111
1970	43,176	3,405	7.9	2,516	1,283	889
1971	44,087	4,203	9.5	3,080	1,567	1,123
1972	49,854	3,795	7.6	2,954	1,119	841
1973	71,865	5,142	7.2	3,788	1,664	1,354
1974	99,437	7,095	7.1	5,273	2,655	1,822
1975	108,856	7,792	7.2	5,324	2,397	2,468
1976	116,794	7,843	6.7	5,677	2,468	2,166
1977	123,182	7,581	6.2	5,049	1,936	2,532
1978	145,847	10,001	6.9	6,018	2,558	3,983
1979	186,363	11,747	6.3	9,772	4,998	1,975
1980	225,566	15,506	6.9	13,248	6,727	2,258
1981	238,715	17,634	7.4	13,312	7,180	4,322
1982	216,442	15,603	7.2	9,608	3,834	5,995
1983	205,639	16,065	7.8	10,595	4,683	5,470
1984	223,976	15,008	6.7	9,659	3,195	5,350
1985	218,815	18,725	8.6	12,942	5,518	5,783
1986	227,159	19,728	8.7	14,851	6,276	4,875
1987	254,122	22,480	8.8	15,768	6,377	6,714
1988	322,426	26,947	8.4	20,298	8,766	6,651
1989	363,812	32,111	8.8	25,619	12,313	6,492
1990	393,592	39,083	9.9	31,517	16,691	7,566
1991	421,730	43,788	10.4	35,548	20,881	8,239
1992	448,164	45,018	10.0	36,906	22,379	8,111
1993	465,091	39,418	8.5	31,823	18,146	7,596
1994	512,626	37,373	7.3	30,050	15,931	7,322
1995	584,742	33,071	5.7	25,079	10,606	7,991
1996	625,075	40,270	6.4	29,477	13,624	10,792
1997	689,182	50,374	7.3	40,075	21,028	10,299

Source: Bureau of the Census, Foreign Trade Division and Aerospace Industries Association, based on data from International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a Includes DoD shipments and undocumented exports to Canada, free alongside ship basis.

U.S. EXPORTS OF AEROSPACE PRODUCTS[a] BY MAJOR COUNTRIES OF DESTINATION

Calendar Years 1993–1997
(Millions of Dollars)

Major Countries of Destination	1993	1994	1995	1996	1997
Australia	$ 543	$ 812	$ 635	$ 939	$ 885
Brazil	627	483	584	715	1,045
Canada	1,872	1,827	2,259	2,704	2,796
China	2,384	2,047	1,250	1,705	2,256
Egypt	654	518	211	293	960
France	3,339	2,857	1,846	2,013	2,688
Germany	1,764	1,612	1,701	1,907	2,519
Israel	967	994	604	473	716
Italy	547	1,003	1,014	852	629
Japan	3,581	4,099	3,587	3,772	5,071
Korea, South	1,588	1,782	2,358	2,293	2,479
Malaysia	1,517	990	287	330	1,440
Netherlands	1,162	1,643	2,096	1,368	1,468
Saudi Arabia	545	378	760	1,707	2,625
Singapore	1,485	1,839	1,544	1,612	2,030
Switzerland	312	443	349	1,707	998
Taiwan	2,133	1,790	1,961	1,535	2,407
Thailand	324	336	395	1,032	1,186
Turkey	1,223	886	457	280	541
United Kingdom	3,533	3,601	2,700	3,400	6,471

Source: U.S. Department of Commerce, International Trade Administration.
a Includes all civil products, free alongside ship basis; excludes military products whose country of destination are not reported.

U.S. IMPORTS OF AEROSPACE PRODUCTS[a] BY MAJOR COUNTRIES OF ORIGIN

Calendar Years 1993–1997
(Millions of Dollars)

Major Countries of Origin	1993	1994	1995	1996	1997
Brazil	$ 119	$ 73	$ 110	$ 154	$ 371
Canada	2,072	2,443	2,461	3,233	3,800
France	4,249	4,087	3,072	3,043	4,087
Germany	478	699	826	1,039	1,187
Israel	203	257	354	443	439
Italy	368	274	348	405	480
Japan	538	583	671	1,081	1,728
Netherlands	707	505	308	142	227
Singapore	142	180	164	204	276
Sweden	135	96	185	342	287
United Kingdom	2,523	2,546	2,236	2,634	4,034

Source: U.S. Department of Commerce, International Trade Administration.
a Includes civil and military products, c.i.f. (Cost, Insurance, and Freight) basis.

U.S. EXPORTS OF AEROSPACE PRODUCTS

Calendar Years 1994–1997
(Millions of Dollars)

Aerospace Exports	1994	1995	1996	1997
TOTAL	$37,373	$33,071	$40,270	$50,374
TOTAL CIVIL	$30,050	$25,079	$29,477	$40,075
Complete Aircraft—TOTAL	$17,737	$12,275	$15,111	$23,112
Transports	15,931	10,606	13,624	21,028
General Aviation[a]	598	593	598	946
Helicopters	82	170	212	207
Used Aircraft	1,111	876	653	909
Other, Incl. Spacecraft[b]	314	466	429	520
Aircraft Engines—TOTAL	2,386	1,750	1,996	2,092
Turbine Engines	2,292	1,661	1,912	1,995
Piston Engines	94	89	84	97
Aircraft and Engine Parts Incl. Spares—TOTAL	9,628	10,618	11,965	14,373
Aircraft Parts & Accessories	6,319	7,059	8,035	9,196
Aircraft Engine Parts	3,309	3,559	3,930	5,177
TOTAL MILITARY	$ 7,322	$ 7,991	$10,792	$10,299
Complete Aircraft—TOTAL[c]	$ 1,094	$ 1,339	$ 3,859	$ 2,397
Fighters & Fighter Bombers	248	228	3,105	1,823
Transports	140	453	60	—
Helicopters	410	563	366	391
Used Aircraft	268	63	310	133
Other, Incl. Spacecraft[b]	303	431	315	507
Aircraft Engines—TOTAL	251	191	274	388
Turbine Engines	188	131	213	255
Piston Engines	63	60	62	132
Aircraft and Engine Parts Incl. Spares—TOTAL	4,692	4,582	5,164	5,911
Aircraft Parts & Accessories	4,163	3,934	4,543	5,000
Aircraft Engine Parts	530	648	621	911
Guided Missiles, Rockets, & Parts—TOTAL	1,009	1,481	1,199	1,146
Guided Missiles & Rockets	340	702	504	453
Missile & Rocket Parts	669	759	684	690
Missile & Rocket Engines	1	20	11	3
Missile & Rocket Engine Parts	—	—	—	—

Source: Aerospace Industries Association, based on data from International Trade Administration.

a All fixed-wing aircraft under 33,000 pounds.

b Products within this category are not designated civil or military by the Harmonized Tariff Schedules. Historically, aircraft herein have been predominantly civil. Also, spacecraft not included in "Complete Aircraft—Total."

c Includes aircraft exported under Military Assistance Programs and Foreign Military Sales.

U.S. IMPORTS OF AEROSPACE PRODUCTS

Calendar Years 1994–1997
(Millions of Dollars)

Aerospace Imports	1994	1995	1996	1997
TOTAL	$12,363	$11,509	$13,668	$18,134
TOTAL CIVIL	$ 8,792	$ 8,296	$ 9,881	$12,976
Complete Aircraft—TOTAL	$ 3,787	$ 3,492	$ 3,924	$ 4,656
Transports	1,361	972	823	1,067
General Aviation	1,711	1,449	2,136	2,514
Helicopters	317	300	361	460
Other, Including Used Aircraft, & Gliders, Balloons, & Airships[a]	398	771	604	615
Aircraft Engines—TOTAL	1,400	931	1,019	1,491
Turbine Engines[b]	1,346	887	969	1,471
Piston Engines	55	44	50	20
Aircraft & Engine Parts—TOTAL	3,605	3,873	4,939	6,829
Aircraft Parts and Accessories[b]	2,093	2,252	2,945	4,183
Turbine Engine Parts[b]	1,231	1,416	1,777	2,298
Piston Engine Parts	51	63	85	114
Spacecraft, Other Parts & Accessories[c]	230	142	133	234
TOTAL MILITARY	$ 3,571	$ 3,213	$ 3,787	$ 5,159
Complete Aircraft—TOTAL	$ 22	$ 64	$ 24	$ 13
Aircraft Engines—TOTAL	1,386	907	1,001	1,510
Turbine Engines[b]	1,346	887	969	1,471
Piston Engines Including Parts	40	20	33	38
Aircraft & Engine Parts—TOTAL	2,163	2,242	2,762	3,636
Aircraft Parts[b]	635	613	748	1,000
Turbine Engine Parts[b]	1,212	1,391	1,771	2,296
Spacecraft, Missiles, Rockets, Other Parts, & Accessories[bc]	317	238	242	340

Source: Aerospace Industries Association, based on data from International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1989.
a Products within this category are not designated civil or military by the Harmonized Tariff Schedules. Historically, these products have been predominantly civil.
b Category contains products whose use (civil or military) is unspecified by the Harmonized Tariff Schedules. Figures for those products distributed equally between civil and military.
c Includes satellites, propulsion engines, and parachutes.

U.S. EXPORTS OF MILITARY AIRCRAFT[a]

Calendar Years 1993–1997

	1993	1994	1995	1996	1997
TOTAL NUMBER OF AIRCRAFT.....	632	437	516	429	396
Fighters and Fighter Bombers	47	14	16	78	45
Transports	—	3	7	3	—
Helicopters	93	88	47	41	71
New Aircraft, NEC.....	378	241	387	194	221
Used or Rebuilt Aircraft	114	91	59	113	59
TOTAL VALUE (Millions of Dollars)	$1,460	$1,094	$1,339	$3,859	$2,397
Fighters and Fighter Bombers	$ 764	$ 248	$ 228	$3,105	$1,823
Transports	—	140	453	60	—
Helicopters	607	410	563	366	391
New Aircraft, NEC.....	32	28	33	19	49
Used or Rebuilt Aircraft	57	268	63	310	133

Source: Aerospace Industries Association, based on data from the International Trade Administration.
a Includes aircraft exported under Military Assistance Programs and Foreign Military Sales.
NEC Not elsewhere classified.

U.S. EXPORTS OF CIVIL AIRCRAFT

Calendar Years 1993–1997

Civil Aircraft Exports	1993	1994	1995	1996	1997
TOTAL NUMBER OF AIRCRAFT[a] ...	1,480	1,400	1,323	1,309	1,431
Helicopters—TOTAL	175	154	210	214	259
Under 2,200 lbs	143	118	159	158	199
Over 2,200 lbs	32	36	51	56	60
General Aviation—TOTAL	333	385	363	383	409
Single-Engine	97	125	132	146	188
Multi-Engine, Under 4,400 lbs	104	124	95	88	35
Multi-Engine, 4,400-10,000 lbs ...	74	67	76	94	102
Multi-Engine, 10,000-33,000 lbs ...	58	69	60	55	84
Transports—TOTAL	278	222	137	172	252
Passenger Aircraft, Over 33,000 lbs.....	272	216	128	157	239
Cargo Aircraft, Over 33,000 lbs ...	2	4	7	10	10
Other, Over 33,000 lbs, Incl. Pass./Cargo Combi	4	2	2	5	3
Other Aircraft—TOTAL[a]	694	639	613	540	511
Used or Rebuilt Aircraft.....	694	639	613	540	511
Other Aircraft, Including Balloons, Gliders, & Kites	558	524	398	508	452
TOTAL VALUE (Millions of Dollars)	$19,846	$17,737	$12,275	$15,111	$23,112
Helicopters—TOTAL.....	$ 120	$ 82	$ 170	$ 212	$ 207
Under 2,200 lbs	37	24	34	27	32
Over 2,200 lbs	83	58	137	185	175
General Aviation—TOTAL	551	598	593	598	946
Single-Engine	36	46	74	66	90
Multi-Engine, Under 4,400 lbs	22	23	22	18	14
Multi-Engine, 4,400-10,000 lbs ...	169	182	176	245	349
Multi-Engine, 10,000-33,000 lbs ...	324	348	321	269	493
Transports—TOTAL	18,146	15,931	10,606	13,624	21,028
Passenger Aircraft, Over 33,000 lbs.....	17,237	15,063	9,354	11,949	19,266
Cargo Aircraft, Over 33,000 lbs ...	299	556	930	897	1,251
Other, Over 33,000 lbs, Incl. Pass./Cargo Combi	611	312	321	778	512
Other Aircraft—TOTAL	1,029	1,126	906	678	932
Used or Rebuilt Aircraft.....	1,012	1,111	876	653	909
Other Aircraft, Including Balloons, Gliders, & Kites	17	14	29	25	22

Source: Aerospace Industries Association, based on data from International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a Numbers of gliders, balloons, & kites excluded from civil aircraft totals.

U.S. IMPORTS OF COMPLETE AIRCRAFT

Calendar Years 1994–1997

Aircraft Imports	1994	1995	1996	1997
TOTAL NUMBER OF AIRCRAFT	1,762	1,609	1,646	1,711
Civil Aircraft—TOTAL	1,695	1,492	1,623	1,685
New Complete Aircraft:				
Helicopters	216	206	183	240
General Aviation:				
Single-Engine	105	117	100	99
Multi-Engine, Under 4,400 lbs	8	5	—	2
Multi-Engine, 4,400-10,000 lbs	2	2	1	2
Multi-Engine, Turbojet/Turbofan, 10,000-33,000 lbs	82	72	96	114
Multi-Engine, Other, Including Turboshaft, 10,000-33,000 lbs	64	63	90	65
Transports, Multi-Engine, Over 33,000 lbs	38	22	19	27
Other Civil Aircraft:				
Gliders[a]	102	137	144	145
Balloons & Airships[a]	53	98	200	181
Others including Kites[a]	714	509	410	513
Used or Rebuilt	311	261	380	297
Military Aircraft—TOTAL	67	117	23	26
New Complete Aircraft	25	75	14	4
Used or Rebuilt	42	42	9	22

(Continued on next page)

U.S. IMPORTS OF COMPLETE AIRCRAFT

(Continued)

Aircraft Imports	1994	1995	1996	1997
VALUE (Millions of Dollars)	$3,808.8	$3,556.5	$3,947.7	$4,669.0
Civil Aircraft—TOTAL	$3,787.2	$3,492.6	$3,923.5	$4,655.7
New Complete Aircraft:				
Helicopters	316.7	300.2	360.9	460.1
General Aviation:				
Single-Engine	65.9	48.5	57.8	71.8
Multi-Engine, under 4,400 lbs	2.8	0.3	—	0.2
Multi-Engine, 4,400-10,000 lbs	2.4	3.0	8.0	5.4
Multi-Engine, Turbojet/Turbofan, 10,000-33,000 lbs	1,030.4	902.4	1,286.6	1,795.2
Multi-Engine, Other, including Turboshaft, 10,000-33,000 lbs	609.4	494.6	783.9	641.1
Transports, Multi-Engine, over 33,000 lbs	1,361.3	972.1	822.5	1,066.7
Other Civil Aircraft:				
Gliders[a]	1.2	1.0	1.7	1.8
Balloons & Airships[a]	4.7	11.5	13.0	7.5
Others including Kites[a]	2.3	2.0	1.4	2.2
Used or Rebuilt	389.9	756.9	587.8	603.7
Military Aircraft—TOTAL	$ 21.6	$ 63.9	$ 24.2	$ 13.3
New Complete Aircraft	15.3	63.0	4.7	2.3
Used or Rebuilt	6.3	0.9	19.5	11.0

Source: Aerospace Industries Association, based on data from International Trade Administration.

a Products within this category are not designated civil or military by the Harmonized Tariff Schedules. Historically, these products have been predominantly civil.

U.S. EXPORTS OF COMMERCIAL TRANSPORT AIRCRAFT[a]

Calendar Years 1993–1997

Region of Destination	1993	1994	1995	1996	1997
TOTAL NUMBER EXPORTED ...	278	222	137	172	252
Canada & Greenland	2	—	3	3	—
Latin America & Caribbean	14	8	5	7	11
Europe	89	82	52	52	91
Middle East	13	13	1	5	18
Asia	146	108	71	97	123
Oceania	8	7	2	6	5
Africa	6	4	3	2	4
TOTAL VALUE (Millions of Dollars)	$18,146	$15,931	$10,606	$13,624	$21,028
Canada & Greenland	$ 114	$ —	$ 280	$ 225	$ —
Latin America & Caribbean	805	420	390	566	505
Europe	5,130	5,451	3,502	3,628	7,538
Middle East	517	957	157	543	2,449
Asia	10,840	8,451	6,049	8,110	9,916
Oceania	351	510	126	398	473
Africa	389	144	102	155	147

Source: Aerospace Industries Association, based on data from the International Trade Administration.
a Airframe weight exceeding 33,000 pounds.

U.S. EXPORTS OF CIVIL HELICOPTERS[a]

Calendar Years 1993–1997

Region of Destination	1993	1994	1995	1996	1997
TOTAL NUMBER EXPORTED	175	154	210	214	259
Canada & Greenland	11	5	9	7	9
Latin America & Caribbean	67	43	36	26	36
Europe	61	62	55	64	100
Middle East	2	2	4	2	2
Asia	21	26	50	78	61
Oceania	13	11	25	25	48
Africa	—	5	31	12	3
TOTAL VALUE (Millions of Dollars)	$120.1	$82.1	$170.4	$212.1	$207.1
Canada & Greenland	$ 6.2	$ 1.9	$ 7.9	$ 4.3	$ 4.4
Latin America & Caribbean	24.8	20.0	21.1	6.6	21.9
Europe	62.2	18.7	24.3	24.3	56.5
Middle East	0.5	0.6	9.3	0.0	1.1
Asia	24.4	30.8	83.6	164.7	116.3
Oceania	1.9	9.0	19.0	9.4	4.6
Africa	—	1.2	5.3	2.9	2.4

Source: Aerospace Industries Association, based on data from the International Trade Administration.
a Excludes used helicopters.

U.S. IMPORTS OF CIVIL HELICOPTERS[a]

Calendar Years 1993–1997

Country of Origin	1993	1994	1995	1996	1997
TOTAL NUMBER IMPORTED	159	216	206	183	240
Canada	114	169	172	154	204
France	22	29	11	16	26
Germany	18	14	15	9	9
Italy	3	2	7	4	1
Others[b]	2	2	1	—	—
TOTAL VALUE (Millions of Dollars)	$231.4	$316.7	$300.2	$360.9	$460.1
Canada	$176.1	$274.6	$262.9	$321.8	$415.3
France	28.6	29.6	10.3	20.1	23.7
Germany	15.0	11.7	14.9	8.8	18.3
Italy	9.1	0.0	12.1	10.1	2.9
Others[b]	2.5	0.8	0.0	—	—

Source: Aerospace Industries Association, based on data from the International Trade Administration.
a Excludes used helicopters.
b Includes 1 from New Zealand in 1991; 2 from Japan in 1992; 1 from Japan and 1 from Russia in 1993; 2 from United Kingdom in 1994; and 1 from Israel in 1995.

U.S. EXPORTS OF GENERAL AVIATION AIRCRAFT[a]

Calendar Years 1993–1997

Region of Destination	1993	1994	1995	1996	1997
TOTAL NUMBER EXPORTED	333	385	363	383	409
Canada & Greenland	20	29	32	32	31
Latin America & Caribbean	59	81	70	67	117
Europe	115	94	135	123	131
Middle East	16	28	10	14	1
Asia	77	91	38	49	44
Oceania	15	25	39	40	45
Africa	31	37	39	58	40
TOTAL VALUE (Millions of Dollars)	$550.5	$598.2	$593.4	$597.5	$945.9
Canada & Greenland	$ 27.5	$ 44.9	$ 75.8	$ 73.7	$116.0
Latin America & Caribbean	117.5	203.1	123.0	98.6	282.0
Europe	163.4	128.1	122.6	160.8	220.9
Middle East	65.2	13.0	31.2	17.0	10.8
Asia	106.8	112.6	140.7	92.1	156.5
Oceania	27.2	51.7	47.0	85.5	74.4
Africa	42.9	44.9	53.1	69.7	85.3

Source: Aerospace Industries Association, based on data from the International Trade Administration.
a All fixed-wing aircraft under 33,000 pounds.

U.S. IMPORTS OF GENERAL AVIATION AIRCRAFT[a]

Calendar Years 1993–1997

Country of Origin	1993	1994	1995	1996	1997
TOTAL NUMBER IMPORTED ...	212	261	259	287	282
Brazil	15	7	11	24	21
Canada	33	50	32	66	87
France	66	63	40	29	50
Germany	14	41	52	34	38
Israel	7	5	3	8	5
Japan	2	—	—	—	—
Poland	20	23	23	14	10
Russia	20	14	18	10	4
United Kingdom	26	40	44	43	14
Other	9	18	36	59	53
TOTAL VALUE (Millions of Dollars)	$1,237.8	$1,711.0	$1,448.8	$2,136.2	$2,513.7
Brazil	$ 94.2	$ 49.5	$ 74.7	$ 124.0	$ 256.5
Canada	466.2	625.4	494.6	957.8	1,155.2
France	410.4	556.3	278.8	377.3	748.6
Germany	2.2	156.8	242.5	88.3	26.1
Israel	45.9	29.7	21.4	66.1	40.0
Japan	1.0	—	—	—	—
Poland	1.9	1.9	2.2	1.6	1.3
Russia	2.0	1.7	1.0	0.8	0.2
United Kingdom	201.6	277.7	276.5	260.2	74.8
Other	12.4	172.4	57.0	260.2	211.1

Source: Aerospace Industries Association, based on data from the International Trade Administration.
a All fixed-wing aircraft under 33,000 pounds.

U.S. EXPORTS OF AIRCRAFT ENGINES

Calendar Years 1995–1997
(Values in Millions of Dollars)

	1995		1996		1997	
	Number	Value	Number	Value	Number	Value
TOTAL	11,918	$1,941	11,842	$2,270	22,436	$2,479
Turbine Engines	4,025	$1,792	4,312	$2,124	4,679	$2,250
Civil	2,734	1,661	3,362	1,912	3,259	1,995
Military	1,291	131	950	213	1,420	255
Piston Engines	7,893	148	7,530	146	17,757	229
Civil, New, Under 500 HP	637	17	706	17	630	15
Civil, New, Over 500 HP	224	7	140	4	315	14
Civil, Used	2,668	66	2,605	64	2,054	68
Military	4,364	60	4,079	62	14,758	132

Source: Aerospace Industries Association, based on data from the International Trade Administration.

U.S. IMPORTS OF AIRCRAFT ENGINES[a]

Calendar Years 1995–1997
(Values in Millions of Dollars)

	1995		1996		1997	
	Number	Value	Number	Value	Number	Value
TOTAL	7,523	$1,828	8,428	$2,007	6,347	$2,987
Turbine Engines	2,718	$1,774	2,693	$1,937	3,019	$2,943
Piston Engines	4,805	55	5,735	70	3,328	45
Military	3,241	11	2,682	20	2,859	25
Civil, New, Small	227	1	247	1	167	1
Civil, New, Large	1,155	33	2,605	41	99	2
Civil, Used	182	10	201	8	203	17

Source: Aerospace Industries Association, based on data from the International Trade Administration.
a New and used.

EXPORT-IMPORT BANK LENDING AUTHORITY AND GROSS AUTHORIZATIONS SUMMARY

Fiscal Years 1984–1997
(Millions of Dollars)

LOANS

Year	Lending Authority	Authorizations Summary		
		Direct Loans[a]		
		TOTAL	Direct Credits	Other[b]
1984	$ 3,865	$ 1,465	$1,122	$ 343
1985	3,865	659	320	339
1986	1,059	578	371	207
1987	680	599	332	267
1988	693	685	465	220
1989	719	695	517	202
1990	614	614	318	296
1991	750	777	425	352
1992	(c)	817	661	156
1993	(c)	1,748	1,635	113
1994	(c)	3,016	2,980	37
1995	(c)	1,598	1,271	327
1996	(c)	1,236	1,220	16
1997	(c)	1,549	1,465	84

GUARANTEES AND INSURANCE

Year	Lending Authority	Authorizations Summary		
		TOTAL	Guarantees	Insurance
1984	$10,000	$ 7,151	$1,333	$5,818
1985	10,000	7,850	1,320	6,530
1986	11,484[d]	5,508	1,128	4,380
1987	11,355	7,958	1,514	6,444
1988	13,406	5,735	601	5,134
1989	17,901	5,637	1,292	4,345
1990	10,191	8,174	3,333	4,841
1991	11,349	10,588	6,034	4,554
1992	(c)	11,521	7,301	4,220
1993	(c)	13,324	9,095	4,229
1994	(c)	11,870	7,609	4,261
1995	(c)	10,267	5,712	4,555
1996	(c)	10,280	6,412	3,868
1997	(c)	10,610	7,761	2,849

Source: Export-Import Bank of the United States.

a The value of Direct Loans may exceed Lending Authority because of the inclusion in Direct Loans of the full amount of Certificates of Loan, portions of which are subsequently sold to commercial banks.

b Includes discount loans, medium term, and small business credits.

c No lending limit set on the value of loans or guarantees and insurance beginning with 1992. Instead the subsidy cost of these transactions limited to $603 million in 1992 and $757 million in 1993. However, in 1993, the combined value of loans, guarantees, and insurance transactions could not exceed $15.5 billion.

d Includes $1,800 million proposed I-MATCH Program which would replace direct lending and would allow an estimated $100 million in commercial loan interest buy-down.

EXPORT-IMPORT BANK
TOTAL AUTHORIZATIONS OF LOANS AND GUARANTEES AND AUTHORIZATIONS IN SUPPORT OF AIRCRAFT EXPORTS

Fiscal Years 1983–1997
(Millions of Dollars)

Year	TOTAL AUTHORIZATIONS	Authorizations in Support of Aircraft Exports			
		TOTAL	Percent of TOTAL Authorizations	Commercial Jet Aircraft[a]	Other Aircraft[b]
LOANS[c]					
1983	$ 845	$ 396.7	46.9%	$ 383.8	$ 12.9
1984	1,465	608.0	41.5	531.8	76.2
1985	659	39.7	6.0	12.6	27.1
1986	578	54.6	9.4	46.4	8.2
1987	599	17.0	2.8	13.3	3.7
1988	685	—	—	—	—
1989	695	166.4	23.9	158.0	8.4
1990	614	5.0	0.8	—	5.0
1991	777	—	—	—	—
1992	817	—	—	—	—
1993	1,748	—	—	—	—
1994	3,016	—	—	—	—
1995	1,598	—	—	—	—
1996	1,236	—	—	—	—
1997	1,549	—	—	—	—
GUARANTEES					
1983	$1,741	$ 629.6	36.2%	$ 601.3	$ 28.3
1984	1,333	355.5	26.7	293.5	62.0
1985	1,320	322.4	24.4	288.9	33.5
1986	1,128	329.2	29.2	277.4	51.8
1987	1,514	808.3	53.4	808.3	—
1988	601	89.2	14.8	73.4	15.8
1989	1,292	496.4	38.4	390.4	106.0
1990	3,333	1,666.3	50.0	224.7	1,441.6
1991	6,034	606.0	10.1	566.9	40.0
1992	7,301	1,667.0	22.8	1,597.1	69.9
1993	9,095	3,488.6	38.4	3,488.6	—
1994	7,609	2,959.0	38.9	2,959.0	—
1995	5,712	977.0	17.1	977.0	—
1996	6,412	1,155.0	18.0	1,155.0	—
1997	7,761	1,959.0	25.2	1,959.0	—

Source: Export-Import Bank of the United States.

a Includes complete aircraft, engines, parts, and retrofits.

b Includes business aircraft, general aviation aircraft, helicopters, and related goods and services.

c Loans are commitments for financing by the Eximbank to foreign buyers of U.S. equipment and services, which are made to commercial banks and may subsequently be guaranteed by the Eximbank, in which case the value of the loans is also included with Guarantees.

d Guarantees by the Export-Import Bank provide assurances of repayment of principal and interest on loans made by private lending institutions, such as commercial banks, for major export transactions. Excludes insurance.

EXPORT-IMPORT BANK
SUMMARY OF COMMERCIAL JET AIRCRAFT AUTHORIZATIONS FOR LOANS[a] AND GUARANTEES[b]

Fiscal Years 1976–1997
(Values in Millions of Dollars)

Year	No. of Jet Aircraft[c]		Export Value[c]		No. of New Commitments		Gross Authorizations	
	Loans	Guarantees	Loans	Guarantees	Loans	Guarantees	Loans	Guarantees
New Authorizations:								
1976	77	6	$1,017	$ 139	34	11	$ 398	$ 87
Tr.Qtr.	15	5	219	182	6	3	94	59
1977	31	25	330	902	16	14	138	294
1978	29	5	479	253	18	5	189	77
1979	118	7	2,938	317	35	10	1,399	239
1980	136	21	3,975	901	36	24	1,693	1,088
1981	121	18	4,568	637	26	17	2,550	533
1982	11	6	441	113	5	2	199	78
1983	21	9	779	619	3	4	384	601
1984	37	8	1,023	327	7	4	532	294
1985	—	14	19	481	1	5	13	289
1986	3	13	74	451	1	9	46	277
1987	—	27	22	1,449	1	14	13	808
1988	—	2	—	94	—	2	—	73
1989	3	5	253	459	1	2	158	390
1990	—	6	—	264	—	2	—	225
1991	—	12	—	665	—	3	—	567
1992	—	37	—	1,889	—	12	—	1,597
1993	—	70	—	4,122	—	27	—	3,489
1994	—	59	—	3,507	—	19	—	2,959
1995	—	27	—	1,205	—	12	—	974
1996	—	18	—	1,089	—	8	—	923
1997	—	34	—	2,357	—	14	—	1,959

Source: Export-Import Bank of the United States.

a Loans are commitments for direct financing by the Export-Import Bank to foreign buyers of U.S. equipment and services, which are made by the Export-Import Bank to commercial banks and which subsequently may be guaranteed by the Export-Import Bank in which case the value of the loans is included with Guarantees.

b Guarantees by the Export-Import Bank provide assurances of repayment of principal and interest on loans made by private lending institutions, such as commercial banks, for major export transactions.

c For Export-Import Bank commitments including both loan and guarantee authorization, number of aircraft and export value reported under "Loans."

Tr.Qtr. See Glossary.

EXPORT-IMPORT BANK
AUTHORIZATIONS OF LOANS AND GUARANTEES
IN SUPPORT OF EXPORTS OF COMMERCIAL JET AIRCRAFT

Fiscal Years 1996–1997
(Values in Millions of Dollars)

Customer (Country/Airline)	Number and Aircraft Model or Related Product	Export Value	Authorizations				
			Loans (Direct Credits)				Guarantees
			Amount	Percent Coverage[a]	Interest Rate	Repayment Terms[b]	Amount
FY 1997							
TOTALS	34 aircraft	$2,357	—	—	—	—	$1,959
China/Air China Airlines	2 x 747	$ 270	—	—	—	—	$ 224
China/China Northern Airlines	3 x MD-90	123	—	—	—	—	101
Czech Republic/ Czech Airlines	3 x 737	78	—	—	—	—	63
India/Air India	2 x 747	303	—	—	—	—	244
Kenya/Kenya Airways	2 x 737	62	—	—	—	—	53
Korea/Asian Airlines	1 x 737, 1 x 747, 4 x 767	537	—	—	—	—	446
Korea/Korean Airlines	1 x 747, 2 x 777	372	—	—	—	—	310
Morrocco/Royal Air Maroc	1 x 737	28	—	—	—	—	22
Poland/LOT Polish Airlines	4 x 737, 1 x 767	230	—	—	—	—	197
Turkey/Onur Air Tasimacilik	5 x MD-88	155	—	—	—	—	132
Uzbekistan/Special	2 x 767	200	—	—	—	—	168

(Continued on next page)

EXPORT-IMPORT BANK
LOAN AND GUARANTEE AUTHORIZATIONS
(Continued)

Customer (Country/Airline)	Number and Aircraft Model or Related Product	Export Value	Authorizations				
			Loans (Direct Credits)				Guarantees
			Amount	Percent Coverage[a]	Interest Rate	Repayment Terms[b]	Amount
FY 1996							
TOTALS	18 aircraft	$1,089	—	—	—	—	$923
China/China Northern Airlines	3 x MD-90	$ 115	—	—	—	—	$101
China/China Southern Airlines	1 x 737, 2 x 777	218	—	—	—	—	186
China/Shandong Airlines	3 x 737	98	—	—	—	—	84
China/Yunnan Airlines	3 x 767	187	—	—	—	—	160
Korea/Asian Airlines	1 x 737, 1 x 767	125	—	—	—	—	103
Korea/Asian Airlines	1 x 737, 1 x 747	186	—	—	—	—	159
Philippines/Philippine Airlines	1 x 747	122	—	—	—	—	98
Poland/LOT Polish Airlines	1 x 737	38	—	—	—	—	32

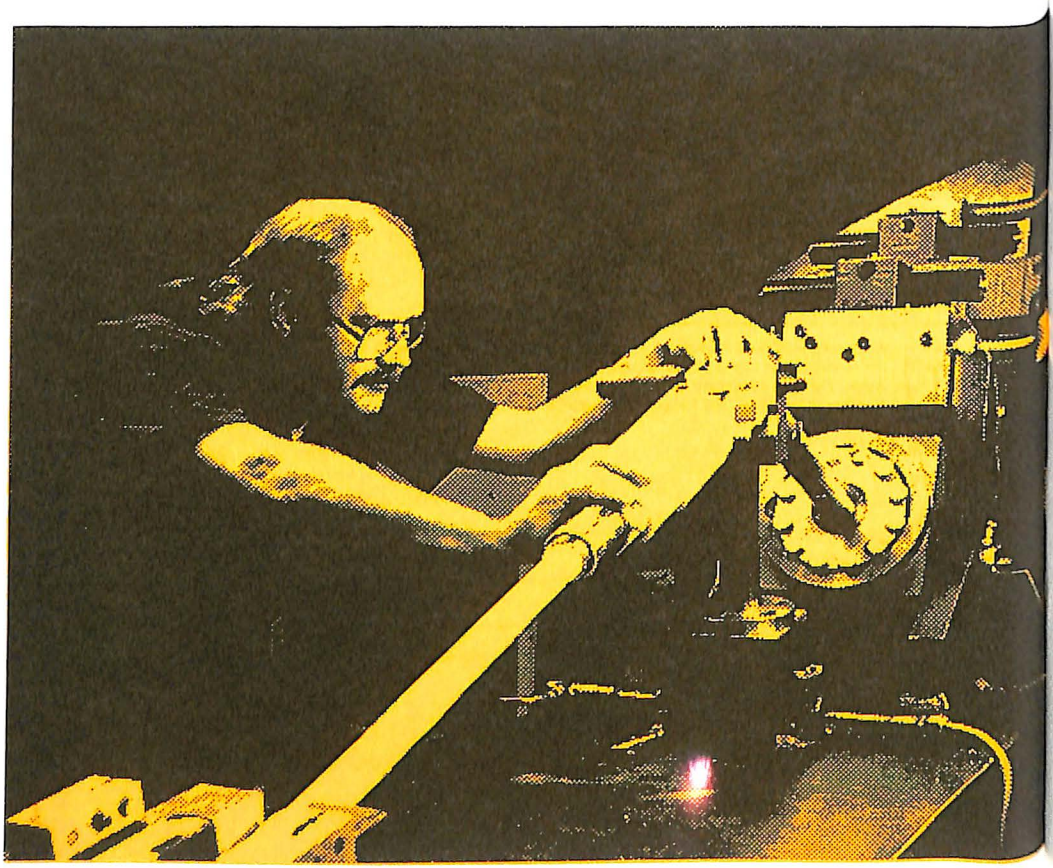
Source: Aerospace Industries Assocation, based on data from the Export-Import Bank of the United States.
NOTE: For definitions of Loans and Guarantees, see Export-Import Bank tables on previous pages.
a Amount of loan as percent of export value.
b Number of payments and frequency (S=semi-annual).

Employment

EMPLOYMENT IN THE AEROSPACE industry saw its first significant increase since 1989. After six years of contraction, beginning in 1990, aerospace employment bottomed out in 1995 and 1996 before dramatically rebounding in 1997.

On an annual average employment basis, the industry's work force jumped by 62,000, reaching a total of 858,000, a gain of 7.8% over the previous year. Hiring in the aircraft manufacturing sector accounted for two-thirds of the new jobs.

The 1997 employment figure represented 4.6% of the total employment in all U.S. manufacturing industries; that compares with 4.3% in 1996 and 6.8% at its peak level in the 1989-1990 period. The aerospace work force also represented 7.8% of total employment by U.S.



companies engaged in production of durable goods; the comparable figures were 7.4% in 1996 and 11.7% at its peak level in 1990.

The overall increase in employment was fueled by a gain of 42,000 jobs in the aircraft, engines, and parts industry; and a gain of 19,000 jobs in the catch-all "other" segment that includes communications, navigation, flight control, displays, and related equipment. The missiles and space vehicles segment accounted for another 1,000 new workers.

The total aerospace payroll for 1997 was $32 billion, up from $28 billion the previous year. Both figures include lump-sum payments made by many aerospace companies in lieu of general wage increases or cost-of-living adjustments. Expressed as a percentage of the total payroll of all U.S. manufacturing industries ($706 billion), the aerospace payroll amounted to 4.5%, up from 4.2% in 1996.

Average weekly earnings for production workers (again including lump-sum payments) came to $849, up from $806 for the previous year. The highest-paying jobs among production workers were those in airframe fabrication at $932 per week. For other segments, the average weekly rate was $843 for employees working on missiles and space systems, $838 for engine and parts workers, and $752 for those working on aircraft parts and equipment other than engines.

Average hourly earnings amounted to $19.07, up from $18.72 in 1996. The average work week for production workers was 44.6 hours, which compares to 43.1 hours in the previous year.

After experiencing a surge of employment of aerospace research and development (R&D) scientists and engineers from 1995-1996, when 32,000 joined the aerospace work force, the number of R&D scientists and engineers dipped slightly in 1997 to 94,600 from the previous year's 95,500. Aerospace scientists and engineers accounted for 10.7% of the 885,700 R&D scientists and engineers employed by all industries known to conduct or finance research and development.

After holding fairly steady at around one million workers throughout the 1980s and early 1990s, the federal civilian work force in the DoD continued a steady decline that began in 1993. In 1997, DoD federal civilian employment dipped to 772,000 from 806,000 the previous year, and it is projected to continue to fall over the next two years. Employment in NASA programs also dropped to 189,000 in 1997 from 198,000 the previous year. Of the 189,000 workers, contractor employees accounted for 89%, or 169,000 employees to the 20,000 NASA employees.

ANNUAL AVERAGE EMPLOYMENT IN ALL MANUFACTURING, DURABLE GOODS, AND AEROSPACE INDUSTRIES

Calendar Years 1979–1997
(Thousands of Employees)

Year	All Manufacturing Industries	Durable Goods Industries	Aerospace Industry[a]		
			TOTAL	As Percent of	
				All Manufacturing	Durable Goods
1979	21,040	12,730	1,007	4.8%	7.9%
1980	20,285	12,159	1,080	5.3	8.9
1981	20,170	12,082	1,087	5.4	9.0
1982	18,780	11,014	1,038	5.5	9.4
1983	18,432	10,707	1,019	5.5	9.5
1984	19,372	11,476	1,058	5.5	9.2
1985	19,248	11,458	1,151	6.0	10.1
1986	18,947	11,195	1,241	6.6	11.1
1987	18,999	11,154	1,282	6.8	11.5
1988	19,314	11,363	1,294	6.7	11.4
1989	19,391	11,394	1,314	6.8	11.5
1990	19,076	11,109	1,302	6.8	11.7
1991	18,406	10,569	1,214	6.6	11.5
1992	18,104	10,277	1,100	6.1	10.7
1993	18,075	10,221	966	5.3	9.5
1994	18,321	10,448	855	4.7	8.2
1995	18,524	10,683	796	4.3	7.5
1996[r]	18,495	10,789	796	4.3	7.4
1997	18,657	10,987	858	4.6	7.8

Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly) and Aerospace Industries Association estimates.
a See Glossary for detailed explanation of "Aerospace Employment."
r Revised.

ANNUAL PAYROLL
AEROSPACE INDUSTRY AND ALL MANUFACTURING INDUSTRIES

Calendar Years 1984–1997
(Millions of Dollars)

Year	All Manufacturing Industries[a]	Aerospace Industry[b]			Aerospace As Percent of All Manufacturing
		TOTAL	Production Workers	Other Workers	
1984	$439,100	$23,773	$ 8,746	$15,027	5.4%
1985	460,900	26,749	9,837	16,911	5.8
1986	473,200	29,547	11,038	18,509	6.2
1987	490,300	31,101	11,700	19,401	6.3
1988	524,000	32,566	11,744	20,822	6.2
1989	541,800	34,154	12,440	21,714	6.3
1990	556,100	35,590	13,020	22,570	6.4
1991	562,500	34,520	12,536	21,984	6.1
1992	583,500	33,123	11,812	21,311	5.7
1993	593,100	30,391	10,673	19,718	5.1
1994	621,100	28,395	9,901	18,494	4.6
1995	648,400	26,603	9,272	17,331	4.1
1996[r]	674,700	27,987	10,105	17,882	4.1
1997	706,000	31,483	12,068	19,416	4.5

AEROSPACE — INCLUDING LUMP-SUM PAYMENTS[c]

Year	TOTAL	Production Workers	Other Workers	Aerospace As Percent of All Manufacturing
1984	$ 23,813	$ 8,786	$15,027	5.4%
1985	26,782	9,871	16,911	5.8
1986	29,611	11,102	18,509	6.3
1987	31,262	11,862	19,401	6.4
1988	32,757	11,935	20,822	6.3
1989	34,396	12,682	21,714	6.3
1990	35,862	13,292	22,570	6.4
1991	34,688	12,704	21,984	6.2
1992	33,257	11,947	21,311	5.7
1993	30,548	10,830	19,718	5.2
1994	28,420	9,926	18,494	4.6
1995	26,618	9,287	17,331	4.1
1996[r]	28,046	10,163	17,882	4.2
1997	31,570	12,155	19,416	4.5

Source: Bureau of Economic Analysis, "Survey of Current Business" (Monthly) and Aerospace Industries Association estimates based on Bureau of Labor Statistics, "Employment and Earnings" (Monthly).

a See Glossary for explanation of "Payroll, All Manufacturing."

b Based on combined annual average employment and average weekly earnings for SICs 372 and 376.

c Many aerospace manufacturers have included lump-sum payments in labor settlements since late 1983 in lieu of general wage increases and/or cost of living adjustments. These payments are reported by BLS in separate wage series for SICs 3721 & 3761 and are included by AIA in the totals for production workers and all aerospace.

r Revised.

EMPLOYMENT IN THE AEROSPACE INDUSTRY[a]

Calendar Years 1983–1997
(Annual Average, Thousands of Employees)

Year	TOTAL	Aircraft, Engines, & Parts (SIC 372)	Missiles & Space Vehicles (SIC 376)	Other[b]
TOTAL EMPLOYMENT				
1983	1,019	562	141	317
1984	1,058	575	154	329
1985	1,151	616	177	358
1986	1,241	656	200	386
1987	1,282	678	206	399
1988	1,294	684	208	402
1989	1,314	711	194	408
1990	1,302	712	185	405
1991	1,214	669	168	378
1992	1,100	612	146	342
1993	966	542	124	300
1994	855	482	108	266
1995	796	451	98	248
1996	796[r]	458[r]	90	248
1997	858	500	91	267
PRODUCTION WORKERS				
1983	342	274	46	23
1984	351	276	52	23
1985	382	295	62	25
1986	417	323	67	28
1987	434	339	67	29
1988	422	331	63	28
1989	432	344	60	29
1990	430	345	57	29
1991	399	324	48	27
1992	355	291	40	24
1993	308	253	35	20
1994	271	222	31	18
1995	252	208	28	17
1996	260[r]	218	25	17
1997	295	251	24	20

Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly) and Aerospace Industries Association estimates.
a See Glossary for detailed explanation of "Aerospace Employment."
b Communications, navigation, flight control, and displays (aerospace-related portions of SICs 366, 381, & 382).
r Revised.

EMPLOYMENT IN THE AIRCRAFT, ENGINES, AND PARTS INDUSTRY[a]

Calendar Years 1983–1997
(Annual Average, Thousands of Employees)

Year	TOTAL (SIC 372)	Airframes (SIC 3721)	Engines and Parts (SIC 3724)	Other Parts & Equipment (SIC 3728)
TOTAL EMPLOYMENT				
1983	561.6	304.7	140.1	116.9
1984	574.9	306.1	140.2	128.7
1985	616.2	325.6	147.5	143.2
1986	655.8	338.9	153.6	163.2
1987	678.0	356.4	158.2	163.4
1988	683.5	368.5	155.8	159.3
1989	711.0	382.2	153.5	175.2
1990	712.3	381.0	151.7	179.5
1991	669.2	355.6	143.2	170.3
1992	611.7	332.1	126.6	153.0
1993	542.0	301.4	109.2	131.4
1994	481.5	271.3	95.1	115.1
1995	450.5	243.6	93.0	113.9
1996[r]	458.1	243.1	94.7	120.4
1997	500.3	263.4	99.8	137.1
PRODUCTION WORKERS				
1983	273.9	131.5	74.7	67.1
1984	276.0	128.2	73.0	73.3
1985	294.6	135.5	74.8	82.2
1986	322.5	146.6	78.7	94.3
1987	338.5	159.1	80.5	96.3
1988	331.3	162.1	77.1	92.1
1989	343.7	167.4	76.8	99.5
1990	344.6	164.1	77.2	103.2
1991	323.6	151.6	73.1	98.8
1992	291.4	137.8	64.3	89.2
1993	252.5	122.7	53.6	76.2
1994	222.0	108.1	46.9	67.0
1995	207.5	93.6	46.2	67.7
1996[r]	217.7	95.6	48.8	73.3
1997	251.0	110.6	53.6	86.8

Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly).
a See Glossary for detailed explanation of "Aerospace Employment."
r Revised.

AVERAGE HOURLY EARNINGS IN THE AEROSPACE INDUSTRY

Production Workers Only
Calendar Years 1981–1997

Year	TOTAL[a]	Aircraft (SIC 372)				Guided Missiles, Space Vehicles & Parts (SIC 376)	Complete Guided Missiles, & Space Vehicles (SIC 3761)
		TOTAL[a]	Airframes (SIC 3721)	Engines & Parts (SIC 3724)	Other Parts & Equipment (SIC 3728)		
AVERAGE HOURLY EARNINGS[b]							
1981	$10.29	$10.31	$10.74	$10.41	$ 9.35	$10.06	$10.34
1982	11.20	11.23	11.85	11.16	10.17	10.95	11.21
1983	11.79	11.82	12.58	11.61	10.73	11.59	11.84
1984	12.24	12.32	12.91	12.40	11.37	11.82	12.01
1985	12.54	12.62	13.18	12.85	11.66	12.14	12.36
1986	12.75	12.86	13.48	13.08	11.90	12.20	12.48
1987	13.10	13.17	13.74	13.33	12.23	12.73	13.09
1988	13.48	13.55	14.18	13.80	12.28	13.13	13.53
1989	14.10	14.17	14.89	14.42	12.81	13.70	14.20
1990	14.73	14.79	15.66	14.84	13.37	14.39	14.82
1991	15.51	15.60	16.72	15.38	14.05	14.90	15.21
1992	16.46	16.53	17.70	16.28	14.89	15.99	16.45
1993	17.18	17.23	18.43	16.70	15.72	16.80	17.43
1994	17.89	17.95	19.50	17.31	16.01	17.48	18.29
1995	17.99	18.02	19.97	17.34	15.93	17.74	18.58
1996	18.56[r]	18.57[r]	20.49	18.22	16.42[r]	18.51	19.34
1997	18.92	18.86	20.76	18.58	16.67	19.54	20.75
AVERAGE HOURLY EARNINGS INCLUDING LUMP-SUM WAGE PAYMENTS[c]							
1984	$12.37	$12.46	$13.11	$12.40	$11.37	$11.92	$12.14
1985	12.69	12.77	13.40	12.85	11.66	12.29	12.56
1986	12.94	13.06	13.80	13.08	11.90	12.33	12.66
1987	13.37	13.48	14.32	13.33	12.23	12.80	13.19
1988	13.73	13.79	14.65	13.80	12.28	13.36	13.87
1989	14.37	14.44	15.41	14.42	12.81	13.98	14.63
1990	15.04	15.10	16.32	14.84	13.37	14.67	15.26
1991	15.71	15.81	17.16	15.38	14.05	15.09	15.49
1992	16.67	16.75	18.18	16.28	14.89	16.05	16.54
1993	17.44	17.52	19.00	16.70	15.72	16.83	17.47
1994	17.96	18.02	19.57	17.31	16.01	17.53	18.37
1995	18.05	18.09	20.02	17.34	15.93	17.77	18.62
1996	18.72	18.74[r]	20.79	18.22	16.42[r]	18.51	19.34
1997	19.07	19.03	21.09	18.58	16.67	19.55	20.76

Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly) and Aerospace Industries Association estimates.
a TOTAL columns are employment-based weighted averages.
b Includes overtime premiums.
c Many aerospace manufacturers have included lump-sum payments in labor settlements since late 1983 in lieu of general wage increases and/or cost of living adjustments. These payments are reported by BLS in separate wage series for SICs 3721 & 3761 and are included by AIA in totals.
r Revised.

AVERAGE WEEKLY EARNINGS IN THE AEROSPACE INDUSTRY

Production Workers Only
Calendar Years 1981–1997

Year	TOTAL[a]	Aircraft (SIC 372)				Guided Missiles, Space Vehicles & Parts (SIC 376)	Complete Guided Missiles, & Space Vehicles (SIC 3761)
		TOTAL[a]	Airframes (SIC 3721)	Engines & Parts (SIC 3724)	Other Parts & Equipment (SIC 3728)		
AVERAGE WEEKLY EARNINGS[b]							
1981	$424	$426	$444	$422	$396	$410	$420
1982	460	462	485	454	426	447	461
1983	486	487	513	476	453	480	494
1984	513	516	532	523	486	496	508
1985	531	534	547	542	506	515	527
1986	545	550	568	561	520	517	533
1987	556	558	578	567	523	541	556
1988	573	575	596	582	529	567	585
1989	593	594	616	616	542	589	611
1990	624	626	656	637	570	612	634
1991	648	651	694	654	583	632	649
1992	685	689	736	689	615	652	666
1993	714	717	756	715	657	696	727
1994	754	756	800	753	688	738	779
1995	758	757	809	770	677	765	812
1996	801	802[r]	859	813	721	790	837
1997	843	843	918	838	752	842	896
AVERAGE WEEKLY EARNINGS INCLUDING LUMP-SUM PAYMENTS[c]							
1984	$515	$518	$540	$523	$486	$501	$514
1985	532	535	556	542	506	521	535
1986	548	553	581	561	520	523	541
1987	563	567	603	567	523	544	561
1988	583	584	615	582	529	577	599
1989	605	605	638	616	542	601	629
1990	637	639	684	637	570	624	653
1991	657	659	712	654	583	640	661
1992	693	698	756	689	615	655	670
1993	725	729	779	715	657	697	728
1994	755	758	802	753	688	740	783
1995	759	758	811	770	677	766	814
1996	806	807[r]	871	813	721	790	837
1997	849	850	932	838	752	843	897

Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly) and Aerospace Industries Association estimates.

a TOTAL columns are employment-based weighted averages.

b Includes overtime premiums.

c Many aerospace manufacturers have included lump-sum payments in labor settlements since late 1983 in lieu of general wage increases and/or cost of living adjustments. These payments are reported by BLS in separate wage series for SICs 3721 & 3761 and are included by AIA in totals.

r Revised.

AVERAGE HOURS IN THE AEROSPACE INDUSTRY

Production Workers Only
Calendar Years 1983–1997

Year	TOTAL[a]	Aircraft (SIC 372)				Guided Missiles, Space Vehicles & Parts (SIC 376)	Complete Guided Missiles, & Space Vehicles (SIC 3761)
		TOTAL[a]	Airframes (SIC 3721)	Engines & Parts (SIC 3724)	Other Parts & Equipment (SIC 3728)		
AVERAGE WEEKLY HOURS							
1983	41.2	41.2	40.8	41.0	42.2	41.4	41.7
1984	41.9	41.9	41.2	42.2	42.7	42.0	42.3
1985	42.3	42.3	41.5	42.2	43.4	42.4	42.6
1986	42.7	42.8	42.1	42.9	43.7	42.4	42.7
1987	42.4	42.4	42.1	42.5	42.8	42.5	42.5
1988	42.5	42.4	42.0	42.2	43.1	43.2	43.2
1989	42.1	41.9	41.4	42.7	42.3	43.0	43.0
1990	42.3	42.3	41.9	42.9	42.6	42.5	42.8
1991	41.8	41.7	41.5	42.5	41.5	42.4	42.7
1992	41.6	41.7	41.6	42.3	41.3	40.8	40.5
1993	41.6	41.6	41.0	42.8	41.8	41.4	41.7
1994	42.1	42.1	41.0	43.5	43.0	42.2	42.6
1995	42.1	42.0	40.5	44.4	42.5	43.1	43.7
1996	43.1	43.2	41.9	44.6	43.9	42.7	43.3
1997	44.6	44.7	44.2	45.1	45.1	43.1	43.2
AVERAGE WEEKLY OVERTIME HOURS							
1983	3.1	3.1	2.5	3.7	3.7	3.3	3.5
1984	3.9	4.0	3.0	5.1	4.6	3.3	3.4
1985	4.6	4.6	3.5	5.4	5.3	4.6	5.0
1986	4.8	4.9	4.2	5.5	5.5	4.4	4.7
1987	4.8	4.9	4.4	5.0	5.4	4.2	4.3
1988	4.6	4.6	4.3	4.6	5.1	4.5	4.6
1989	5.0	5.1	5.0	5.4	5.0	4.4	4.5
1990	4.5	4.6	4.3	5.3	4.5	3.8	4.1
1991	4.0	4.0	4.1	4.5	3.5	3.9	4.5
1992	3.6	3.7	3.6	4.4	3.3	2.8	3.1
1993	3.8	3.9	3.7	4.6	3.7	2.9	3.2
1994	4.5	4.6	4.1	5.3	4.8	3.7	3.8
1995	4.8	4.9	4.2	5.9	5.2	4.2	4.6
1996	5.7	5.9	5.3[r]	6.5	6.3	3.9	4.2
1997	6.9	7.2	7.2	6.8	7.3	4.3	4.3

Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly) and Aerospace Industries Association estimates.
a TOTAL columns are employment-based weighted averages.
r Revised.

EMPLOYMENT AND COST OF R&D SCIENTISTS AND ENGINEERS ALL INDUSTRIES AND AEROSPACE INDUSTRY

Calendar Years 1979–1997

Year	Employment[a]			Cost Per R&D Scientist and Engineer[d]	
	All Industries[b] (Thousands)	Aerospace[c] (Thousands)	Aerospace as a Percent of All Industries	All Industries[b]	Aerospace[c]
1979	423.9	86.5	20.4%	$ 87,400	$ 93,300
1980	450.6	85.9	19.1	94,900	101,600
1981	487.8	95.2	19.5	103,900	128,400
1982	509.8	91.1	17.9	111,600	148,800
1983	540.9	103.1	19.1	116,000	143,600
1984	584.1	111.5	19.1	124,000	156,000
1985	622.5	130.2	20.9	130,200	161,700
1986	671.0	144.8	21.6	128,500	149,800
1987	695.8	136.3	19.6	128,800	180,400
1988	708.6	136.4	19.2	132,300	193,300
1989	722.5	134.8	18.7	134,500	207,300
1990	743.6	115.3	15.5	141,300	213,700
1991	773.4	100.2	13.0	148,600	177,000
1992	779.3	92.9	11.9	157,912	180,552
1993	764.7	97.9	12.8	153,336	176,450
1994	768.5	72.8	9.5	157,601	217,219
1995	746.1	63.5	8.5	167,339	213,328
1996	832.8	95.5	11.5	168,362	170,733
1997	885.7	94.6	10.7	NA	NA

Source: National Science Foundation.

a Employment as of January. Scientists and engineers working less than full time have been included in terms of their full time equivalent number.

b All manufacturing industries and those non-manufacturing industries known to conduct or finance research and development.

c Standard Industrial Classification codes 372 and 376.

d The arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years, divided into the total R&D expenditures of each industry during the earlier year.

NA Not available.

EMPLOYMENT IN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION PROGRAMS

End of Fiscal Years 1961–1999

Year	TOTAL	NASA Employees	Contractor Employees [a]
1961	74,577	17,077	57,500
1962	137,656	22,156	115,500
1963	246,304	27,904	218,400
1964	379,084	31,984	347,100
1965	409,900	33,200	376,700
1966	393,924	33,924	360,000
1967	306,926	33,726	273,200
1968	267,871	32,471	235,400
1969	218,345	31,745	186,600
1970	160,850	31,350	129,500
1971	143,578	29,478	114,100
1972	138,800	27,500	111,300
1973	134,850	26,850	108,000
1974	125,220	25,020	100,200
1975	127,733	24,333	103,400
1976	130,739	24,039	108,000
1977	124,136	23,636	100,500
1978	124,637	23,237	101,400
1979	131,931	22,831	109,100
1980	135,613	22,613	113,000
1981	133,473	21,873	111,600
1982	128,730	22,430	106,300
1983	129,246	22,246	107,000
1984	162,080	22,080	140,000
1985	131,991	21,991	110,000
1986	154,660	21,660	133,000
1987	165,001	22,001	143,000
1988	172,326	22,326	150,000
1989	213,054	23,054	190,000
1990	221,829	23,829	198,000
1991	223,149	24,149	199,000
1992	230,513	24,513	206,000
1993	228,674	24,174	204,500
1994	217,910	23,873	194,037
1995	209,355	22,355	187,000
1996	198,113	21,113	177,000
1997	189,070	20,070	169,000
1998 [E]	185,600	19,600	166,000
1999 [E]	180,700	18,700	162,000

Source: Office of Management and Budget, "Budget of the United States Government" (Annually) and NASA Headquarters.

a Includes estimates of manpower for hardware and related contracts, as well as actual work-years for support service contracts. Increase in FY 1984 caused by change in estimating methodology to reflect more accurately the mix of support and development contractors.

E Estimate.

FEDERAL CIVILIAN EMPLOYMENT[a] IN THE DEPARTMENT OF DEFENSE

Fiscal Years 1967–1999

Year	TOTAL	Civil Functions[b]	Military Functions[c]
1967	1,225,637	31,980	1,193,657
1968	1,288,130	32,062	1,256,068
1969	1,257,091	31,214	1,225,877
1970	1,159,935	30,293	1,129,642
1971	1,092,804	30,063	1,062,741
1972	1,040,147	30,585	1,009,562
1973	987,281	29,971	957,310
1974	1,002,850	29,072	973,778
1975	983,790	29,069	954,721
1976	951,034	28,648	922,386
1977	940,549	28,912	911,637
1978	933,071	28,962	904,109
1979	914,582	28,592	885,990
1980	907,700	27,700	880,000
1981	981,400	34,400	947,000
1982	1,009,192	31,111	978,081
1983	1,015,622	30,816	984,806
1984	1,040,213	28,681	1,011,532
1985	1,065,624	28,754	1,036,870
1986	1,069,863	28,511	1,041,352
1987	1,059,669	28,352	1,031,317
1988	1,053,000	28,419	1,024,581
1989	1,051,166	28,081	1,023,085
1990	1,048,814	27,651	1,021,163
1991	1,001,183	27,385	973,798
1992	1,000,453	27,584	972,869
1993	958,855	27,055	931,800
1994	896,293	28,001	868,292
1995	849,529	27,790	821,739
1996	806,122	27,180	778,942
1997	771,914	26,164	745,750
1998[E]	757,200	26,200	731,000
1999[E]	734,200	25,700	708,500

Source: Office of Management and Budget, "The Budget of the United States Government" (Annually).

a Full-time equivalent civilian employment.

b Data are estimated for portions of Civil Functions.

c The Department of Defense is exempt from full-time equivalent controls. Data shown are estimated civilian employment for military functions and military assistance.

E Estimate.

OCCUPATIONAL INJURY AND ILLNESS INCIDENCE RATES[a] ALL MANUFACTURING AND AEROSPACE INDUSTRIES

Calendar Years 1992–1996

	1992	1993	1994	1995	1996
All Manufacturing:					
Total Cases	12.5	12.1	12.2	11.6	10.6
Lost Workday Cases	5.4	5.3	5.5	5.3	4.9
Nonfatal Cases without Lost Workdays	7.1	6.8	6.8	6.3	5.7
Aircraft and Parts (SIC 372):					
Total Cases	11.1	10.3	9.7	8.8	7.9
Lost Workday Cases	4.5	4.1	4.0	3.6	3.4
Nonfatal Cases without Lost Workdays	6.6	6.2	5.7	5.3	4.5
Aircraft (SIC 3721):					
Total Cases	10.7	10.2	9.4	8.7	7.3
Lost Workday Cases	4.4	4.0	3.8	3.4	3.0
Nonfatal Cases without Lost Workdays	6.3	6.2	5.7	5.3	4.3
Aircraft Engines and Parts (SIC 3724):					
Total Cases	9.7	9.7	10.0	8.3	7.9
Lost Workday Cases	3.9	4.1	3.8	3.4	3.6
Nonfatal Cases without Lost Workdays	5.7	5.6	6.2	4.9	4.3
Aircraft Parts (SIC 3728):					
Total Cases	13.1	11.1	10.0	9.5	9.1
Lost Workday Cases	5.0	4.3	4.6	4.1	3.9
Nonfatal Cases without Lost Workdays	8.1	6.7	5.5	5.4	5.2
Guided Missiles, Space Vehicles & Parts (SIC 376):					
Total Cases	4.0	4.5	4.5	4.0	3.4
Lost Workday Cases	1.8	1.9	1.8	1.8	1.3
Nonfatal Cases without Lost Workdays	2.3	2.6	2.7	2.2	2.0
Guided Missiles & Space Vehicles (SIC 3761):					
Total Cases	4.0	4.6	4.2	3.7	3.0
Lost Workday Cases	1.9	1.9	1.6	1.5	1.2
Nonfatal Cases without Lost Workdays	2.1	2.7	2.6	2.1	1.8
Space Propulsion Units & Parts (SIC 3764):					
Total Cases	3.6	NA	4.3	NA	NA
Lost Workday Cases	1.5	NA	1.7	NA	NA
Nonfatal Cases without Lost Workdays	2.2	NA	2.5	NA	NA
Other Space Vehicle Equipment (SIC 3769):					
Total Cases	5.1	4.8	6.5	5.8	NA
Lost Workday Cases	1.8	1.8	2.8	3.0	NA
Nonfatal Cases without Lost Workdays	3.3	3.0	3.7	2.8	NA

Source: Bureau of Labor Statistics, "Survey of Occupational Injuries and Illnesses" (Annually).
a Defined as the number of injuries and illnesses per 100 full-time workers. Separate incidence rates also available for occupational injuries only.
NA Not available.

AEROSPACE INDUSTRY WORK STOPPAGES[a]

Calendar Years 1979–1997

Year	Number of Strikes[b]	Number of Workers Involved	Work-Days Idle in Year
1979	12	6,600	103,400
1980	17	4,400	92,900
1981	12	6,100	188,900
1982[c]	4	11,900	45,200
1983	2	8,700	404,100
1984	4	14,600	188,200
1985	4	19,700	289,800
1986	—	—	—
1987	—	—	—
1988	3	10,600	415,800
1989	2	58,500	1,848,000
1990	1	2,300	56,700
1991	1	1,500	—
1992	1	3,800	11,400
1993	2	27,800	34,600
1994	—	—	—
1995	1	33,000	1,551,000
1996	2	7,800	90,100
1997	—	—	—

Source: Bureau of Labor Statistics, "Compensation and Working Conditions" (Monthly).

a Based on SIC 372 of the 1967 Code, which includes missile and space propulsion units and parts and missile and space vehicle equipment not elsewhere classified, but which excludes complete guided missiles and space vehicles.

b Strikes beginning during calendar year.

c Effective 1982, data not available for work stoppages involving fewer than 1,000 employees.

Finance

IN 1997, THE AEROSPACE industry reported net profits of $7.2 billion for the second year in a row, sustaining the substantial gain realized in 1996. Expressed as a percentage of sales, the industry's profit amounted to 5.2%. This was lower than the 6.2% average for all U.S. manufacturing industries. It also marked a drop from the 1996 aerospace profit-to-sales ratio of 5.6%. As a percentage of assets, the 1997 aerospace figure was 4.8%, down from 5.1% in the previous year. As a percentage of equity, aerospace earnings were 17.3%, up slightly from 17.1% in 1996.

The aerospace balance sheet for 1997 showed net working capital of $14.2 billion, down from $16 billion in 1996. Stockholders' equity dropped from $39.8 billion in 1996 to $39.3 billion in 1997, while total assets climbed substantially from $136 billion to $150 billion.

Lockheed Martin Corporation topped the list of DoD's prime contractors in FY 1997 with contracts totaling $11.6 billion. In second place was The Boeing Company with $9.6 billion. The Northrop Grumman Corporation, at $3.5 billion, ranked third. Rounding out the top 10 were: General Dynamics Corporation ($3 billion), Raytheon Company ($2.9 billion), General Motors Corporation ($2.8 billion), United Technologies Corporation ($1.8 billion), General Electric Company ($1.7 billion), Litton Industries, Inc. ($1.6 billion), and Textron, Inc. ($1.4 billion).

Geographically, the South Atlantic region pulled into first place on the list of DoD prime contract awards for aircraft production, moving ahead of both the West North Central region—last year's leader—and the Pacific region. The South Atlantic region received contracts valued at $5.1 billion, or 24% of the total. The Pacific region was second with $4.2 billion (19.7%), and the West North Central region was third with $4.1 billion (19.4%).

In DoD missile/space contract awards, the Pacific region remained far out in front with $4.5 billion (40%). In second place was the Mountain region with $1.5 billion (13.2%), and in third was the South Atlantic region with $1.4 billion (12.4%).

The South Atlantic region also led in DoD awards for electronics and communications equipment with $5.1 billion (36%); the Pacific region was second with $2.9 billion (20%); and the Middle Atlantic was third with $2 billion (14%).

The Boeing Company led the list of NASA co[illegible]actors with contracts in FY 1997 valued at $1.7 billion. The rest of the top 10 included:

United Space Alliance, a Boeing/Lockheed Martin partnership ($1.3 billion), Lockheed Martin Corporation ($1 billion), Thiokol Corporation ($424 million), Lockheed Martin Engineering and Science ($376 million), McDonnell Douglas Corporation ($354 million), AlliedSignal Technical Services ($333 million), TRW Inc. ($281 million), Boeing North America ($237 million), and Computer Sciences Corporation ($163 million).

INCOME STATEMENT AND OPERATING RATIOS FOR AEROSPACE COMPANIES[a]

Calendar Years 1994–1997
(Millions of Dollars)

INCOME STATEMENT	1994	1995	1996	1997
Net Sales, Receipts, Operating Revenues	$120,521	$122,993	$127,051	$139,287
Less: Depreciation, Depletion, & Amortization of Property, Plant, and Equipment	4,500	4,106	4,134	4,011
Less: All Other Operating Costs & Expenses, Including Selling Costs & General & Administrative Expenses	108,306	112,930	112,792	125,712
Income (or Loss) from Operations	$ 7,714	$ 5,957	$ 10,125	$ 9,564
Net Non-Operating Income (Expense)	372	308	8	400
Income (or Loss) before Income Taxes (= Total Income)	$ 8,086	$ 6,264	$ 10,132	$ 9,964
Less: Provision for Current & Deferred Domestic Income Taxes	2,432	1,631	2,982	2,743
Income (or Loss) after Income Taxes (= Net Profit)	$ 5,655	$ 4,633	$ 7,150	$ 7,221
Cash Dividends Charged to Retained Earnings	1,831	1,985	2,071	2,707
Net Income Retained in Business	$ 3,823	$ 2,649	$ 5,078	$ 4,512
Retained Earnings at Beginning of Year[b]	25,655	29,873	30,225	29,973
Adjustments to Retained Earnings[c]	(9)	89	(1,189)	(3,330)
Retained Earnings at End of Year[d]	$ 29,470	$ 32,610	$ 34,115	$ 31,157
OPERATING RATIOS				
Income before Taxes as Percent of Net Sales	6.7%	5.1%	8.0%	7.2%
Provision for Current & Deferred Domestic Income Taxes as Percent of Income before Taxes (Total Income)	30.1	26.0	29.4	27.5
Income after Taxes (Net Profit) as Percent of Net Sales	4.7	3.8	5.6	5.2
Income after Taxes (Net Profit) as Percent of Stockholders' Equity[e]	14.8	11.1	17.1	17.3
Income after Taxes (Net Profit) as Percent of Total Assets[e]	4.3	3.5	5.1	4.8

Source: Bureau of the Census, "Quarterly Financial Report for Manufacturing, Mining, and Trade Corporations" (Quarterly).
NOTE: Detail may not add to totals because of rounding.

a Based on sample of corporate entities classified in SIC codes 372 and 376, having as their principal activity the manufacture of aircraft, guided missiles, space vehicles, and their propulsion, and parts.

b Beginning-of-year retained earnings for any particular year do not equal end-of-year retained earnings for the previous year because of rotation of small companies in survey sample.

c Other direct credits (or charges) to retained earnings (net), including stock and other non-cash dividends, etc.

d Retained Earnings at End of Year CALCULATED AS Retained Earnings at Beginning of Year PLUS Income (Loss) after Income Taxes MINUS Cash Dividends Charged to Retained Earnings PLUS Adjustments to Retained Earnings.

e Average of four quarters.

BALANCE SHEET FOR AEROSPACE COMPANIES[a]

December 31, 1994–1997
(Millions of Dollars)

	1994	1995	1996	1997
Assets:				
Current Assets:				
Cash	$ 2,766	$ 2,540	$ 4,051	$ 3,017
Securities, Commercial Paper, & Other Short-term Financial Investments	3,576	5,271	5,025	4,466
Total Cash and U.S. Government and Other Securities	$ 6,341	$ 7,811	$ 9,076	$ 7,484
Receivables (Total)	16,809	17,303	18,130	18,970
Inventories (Gross)	39,123	38,590	30,873	43,411
Other Current Assets	4,341	5,053	5,531	7,312
Total Current Assets	$ 66,615	$ 68,757	$ 63,611	$ 77,176
Net Plant, Property, & Equipment	26,406	26,285	24,272	24,819
Other Non-Current Assets	39,245	37,275	48,054	48,243
Total Assets	$132,266	$132,318	$135,937	$150,238
Liabilities:				
Current Liabilities:				
Short Term Loans	$ 1,787	$ 1,561	$ 1,951	$ 1,866
Trade Accounts & Notes Payable	10,871	11,592	10,688	11,330
Income Taxes Accrued	1,929	1,479	2,410	2,160
Installments Due on Long Term Debts	1,137	2,014	918	2,567
Other Current Liabilities	35,159	33,318	31,683	45,094
Total Current Liabilities	$ 50,882	$ 49,965	$ 47,650	$ 63,019
Long Term Debt	19,832	19,155	28,091	26,545
Other Non-Current Liabilities	21,270	20,770	20,370	21,349
Total Liabilities	$ 91,984	$ 89,889	$ 96,110	$110,914
Stockholders' Equity:				
Capital Stock	$ 9,706	$ 9,804	$ 10,004	$ 9,438
Retained Earnings	30,557	32,624	29,824	29,886
Total Stockholders' Equity	$ 40,282	$ 42,428	$ 39,828	$ 39,324
Total Liabilities & Stockholders' Equity	$132,266	$132,318	$135,937	$150,238
Net Working Capital	$ 15,733	$ 18,793	$ 15,961	$ 14,157

Source: Bureau of the Census, "Quarterly Financial Report for Manufacturing, Mining, and Trade Corporations" (Quarterly).
NOTE: Detail may not add to totals because of rounding.
a Based on sample of corporate entities classified in SIC codes 372 and 376, having as their principal activity the manufacture of aircraft, guided missiles, space vehicles, their propulsion, and parts.

NET PROFIT AFTER TAXES AS A PERCENT OF SALES, ASSETS, AND EQUITY FOR ALL MANUFACTURING CORPORATIONS AND THE AEROSPACE INDUSTRY

Calendar Years 1983–1997

PERCENT OF SALES

Year	All Manufacturing Corporations	Non-Durable Goods	Durable Goods	Aerospace[a] Industry
1983	4.1%	4.9%	3.1%	3.5%
1984	4.6	4.8	4.4	4.1
1985	3.8	4.1	3.4	3.1
1986	3.7	4.6	2.9	2.8
1987	4.9	5.2	4.5	4.1
1988	6.0	6.7	5.2	4.3
1989	5.0	5.8	4.1	3.3
1990	4.0	4.9	3.0	3.4
1991	2.5	4.2	0.6	1.8[b]
1992	1.0	3.2	(1.4)	(1.4)[b]
1993	2.8	3.7	1.9	3.6
1994	5.4	5.5	5.2	4.7
1995	5.7	6.1	5.3	3.8
1996	6.0	6.6	5.5	5.6
1997	6.2	6.6	5.8	5.2

Year	Percent of Assets[c]		Percent of Equity[c]	
	All Manufacturing	Aerospace[a] Industry	All Manufacturing	Aerospace[a] Industry
1983	5.1%	4.1%	10.5%	12.1%
1984	6.0	4.7	12.5	14.1
1985	4.6	3.6	10.1	11.1
1986	4.2	3.1	9.5	9.4
1987	5.6	4.4	12.8	14.6
1988	6.9	4.4	16.2	14.9
1989	5.6	3.3	13.7	10.7
1990	4.3	3.4	10.7	11.5
1991	2.6	1.9[b]	6.4	6.1[b]
1992	1.0	(1.2)[b]	2.6	(5.2)[b]
1993	2.9	3.5	8.1	13.2
1994	5.8	4.3	15.6	14.8
1995	6.2	3.5	16.2	11.1
1996	6.5	5.1	16.8	17.1
1997	6.6	4.8	16.6	17.3

Source: Bureau of the Census, "Quarterly Financial Report for Manufacturing, Mining, and Trade Corporations" (Quarterly).

a Based on a sample of corporate entities classified in SIC codes 372 and 376, having their principal activity the manufacture of aircraft, guided missiles, space vehicles, their propulsion, and parts.

b Reflects unusually large non-operating expenses totalling $3.4 and $8.7 billion in 1991 and 1992, respectively, due to restructuring changes and the implementation of a change in accounting for future retirement benefit costs.

c Average of four quarters

( ) Net loss after taxes.

NEW CAPITAL EQUIPMENT EXPENDITURES

Calendar Years 1967–1996
(Millions of Dollars)

Year	All Manufacturing Industries	Aerospace Industry[a]	Aircraft, Engines, & Parts	Missiles, Space Vehicles, & Parts
1967	$ 21,503	$ 520	$ 408	$ 111
1968	20,613	399	282	117
1969	22,291	429	340	89
1970	22,164	244	181	62
1971	20,941	115	59	56
1972	24,073	261	169	92
1973	26,979	362	258	104
1974	35,696	407	283	124
1975	37,262	478	369	109
1976	40,545	557	431	126
1977	47,459	673	508	164
1978	55,209	948	775	174
1979	61,533	1,551	1,301	250
1980	70,113	1,923	1,618	306
1981	78,632	2,006	1,637	369
1982	74,562	2,142	1,680	462
1983	61,931	2,159	1,530	629
1984	75,186	3,050	2,091	960
1985	83,058	3,784	2,429	1,356
1986	76,355	4,145	2,818	1,327
1987	78,650	3,612	2,536	1,075
1988	81,593	3,388	2,362	1,026
1989	98,738	3,921	2,800	1,121
1990	105,018	3,490	2,621	869
1991	103,003	3,407	2,823	584
1992	103,188	3,860	3,384	476
1993	103,133	2,725	2,307	418
1994	112,784	2,363	1,969	395
1995[r]	128,473	2,114	1,734	380
1996	139,323	2,513	2,023	490

Source: Bureau of the Census, "Statistics for Industry Groups and Industries" Series M96(AS)-1 (Annually) and "Aerospace Equipment, Including Parts" Series MC92-I-37B.
a Combined total for establishments in SICs 372 or 376.
r Revised.

DEPARTMENT OF DEFENSE
PRIME CONTRACT AWARDS OVER $25,000
FOR SELECTED MAJOR MILITARY HARD GOODS

By Geographic Region
Fiscal Years 1995, 1996, and 1997

Program and Region	Millions of Dollars			Percent of Program Total		
	1995	1996	1997	1995	1996	1997
AIRCRAFT—TOTAL	$23,647	$25,943	$21,066	100.0%	100.0%	100.0%
New England	$ 2,110	$ 1,557	$ 1,749	8.9%	6.0%	8.3%
Middle Atlantic	1,703	1,497	1,272	7.2	5.8	6.0
East North Central	1,367	1,306	1,376	5.8	5.0	6.5
West North Central	5,067	6,419	4,093	21.4	24.7	19.4
South Atlantic.....	4,337	4,802	5,085	18.3	18.5	24.1
East South Central	340	274	380	1.4	1.1	1.8
West South Central	3,856	3,922	2,529	16.3	15.1	12.0
Mountain.....	713	1,131	432	3.0	4.4	2.1
Pacific[a]	4,154	5,036	4,150	17.6	19.4	19.7
MISSILE & SPACE SYSTEMS—TOTAL.....	$11,437	$11,554	$11,180	100.0%	100.0%	100.0%
New England	$ 1,144	$ 1,283	$ 1,066	10.0%	11.1%	9.5%
Middle Atlantic	715	577	802	6.3	5.0	7.2
East North Central	94	106	82	0.8	0.9	0.7
West North Central	473	346	243	4.1	3.0	2.2
South Atlantic.....	1,135	1,460	1,382	9.9	12.6	12.4
East South Central	588	648	665	5.1	5.6	5.9
West South Central	1,177	1,114	989	10.3	9.6	8.8
Mountain.....	1,991	2,079	1,479	17.4	18.0	13.2
Pacific[a]	4,120	3,940	4,471	36.0	34.1	40.0
ELECTRONICS & COMMUNICATIONS EQUIPMENT—TOTAL ...	$14,483	$13,499	$14,230	100.0%	100.0%	100.0%
New England	$ 1,227	$ 1,274	$ 1,194	8.5%	9.4%	8.5%
Middle Atlantic	1,810	1,769	1,983	12.5	13.1	14.1
East North Central	1,105	844	960	7.6	6.3	6.8
West North Central	686	464	401	4.7	3.4	2.9
South Atlantic.....	5,086	4,577	5,083	35.1	33.9	36.2
East South Central	266	252	162	1.8	1.9	1.2
West South Central	851	799	744	5.9	5.9	5.3
Mountain.....	671	606	631	4.6	4.5	4.5
Pacific[a]	2,781	2,914	2,865	19.2	21.6	20.4

Source: Department of Defense, "Prime Contract Awards by Region and State" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Includes Alaska and Hawaii.

DEPARTMENT OF DEFENSE MAJOR CONTRACTORS

Fiscal Years 1993–1997
Listed by rank according to net value of prime contracts awarded during last fiscal year
(Millions of Dollars)

Company	1993	1994	1995	1996	1997
TOTAL CONTRACTS	$123,713	$118,114	$117,552	$119,556	$116,680
Lockheed Martin Corp.[b]	$ 13,367	$ 11,333	$ 12,450	$ 11,998	$ 11,638
The Boeing Co.[c]	10,521	11,523	11,011	12,951	9,645
Northrop Grumman Corp.[d]	4,709	5,202	2,913	2,605	3,476
General Dynamics Corp.[e]	3,144	3,599	2,258	2,670	3,012
Raytheon Co.[f]	3,987	3,507	2,890	3,012	2,863
General Motors Corp.	4,076	3,041	2,993	3,240	2,830
United Technologies Corp.	3,083	2,677	1,775	2,258	1,810
General Electric Co.	1,606	2,705	2,104	1,530	1,677
Litton Industries Inc.	1,555	1,576	1,237	1,709	1,603
Textron Inc.	955	1,236	1,069	1,194	1,445
Science Applications Int'l Corp.	786	868	931	1,065	1,095
GTE Corp.	714	788	633	599	890
ITT Industries Inc.	614	609	648	671	790
TRW Inc.	1,160	848	867	787	782
Westinghouse Electric Corp.	1,569	1,357	1,225	1,441	777[g]
Newport News Shipbuilding Inc.	906	(a)	3,710	(a)	720
Computer Sciences Corp.	422	589	656	712	704
Foundation Health Systems Inc.	818	351	(a)	(a)	656
Avondale Industries Inc.	587	902	(a)	328	622
Humana Inc.	(a)	(a)	(a)	188	621
FMC Corporation	508	582	486	877[h]	611[h]
Tracor Inc.	493	465	510	581	555
AlliedSignal Inc.	454	453	503	512	547
Exxon Corp.	419	530	472	447	539
Dyncorp	492	489	448	380	535
Texas Instruments Inc.	968	690	554	529	529
Standard Missile Co.	(a)	(a)	(a)	372	472
Rockwell International Inc.	(a)	(a)	(a)	(a)	454
BDM International Inc.	312	528	387	407	381
Alliant Techsystems Inc.	612	422	473	457	378

Source: Department of Defense, "100 Companies Receiving the Largest Dollar Volume of Prime Contract Awards" (Annually).
a Not in top 100 companies for indicated year(s).
b Includes awards previously reported separately as Martin Marietta Corp., Lockheed Corp., and Loral Corp.
c Includes awards previously reported separately as McDonnell Douglas Corp. and Rockwell International Corp.
d Includes awards previously reported as Grumman Corporation.
e Includes awards previously reported as Bath Holding Corp.
f Includes awards previously reported as E-Systems Inc.
g Listed as CBS Corp.
h Listed as United Defense Limited Partnership.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MAJOR CONTRACTORS

Fiscal Years 1994–1997
By rank according to net value of NASA prime contracts awarded during last fiscal year
(Millions of Dollars)

Company	1994	1995	1996	1997
TOTAL PROCUREMENTS	$12,913	$13,341	$12,699	$12,790
Awards to Business Firms	9,966	10,311	9,801	9,817
% of TOTAL PROCUREMENTS	77%	77%	77%	77%
The Boeing Co.	$ 1,142	$ 1,442	$ 1,608	$ 1,662
United Space Alliance LLC[b]	910	864	870	1,314
Lockheed Martin Corp.[c]	720	830	833	1,049
Thiokol Corp.	431	440	396	424
Lockheed Martin Engrg. & Science	216	164	166	376
McDonnell Douglas Corp.	565	468	389	354
AlliedSignal Technical Services	247	231	285	333
TRW Inc.	235	288	287	281
Boeing North America[d]	1,069	1,022	756	237
Computer Sciences Corp.	255	311	214	163
EG&G Florida Inc.	200	183	175	156
Hughes Aircraft Co.	13	44	153	153
USBI Booster Production Co.	156	172	157	147
United Technologies Corp.	119	159	162	140
Hughes Information Tech. Corp.	(a)	87	133	117
Boeing Commercial Airplane Group	25	89	83	90
Lockheed Martin Aerospace Corp.[f]	119	164	161	72
General Electric Co.	32	51	58	69
Swales & Associates	30	33	33	68
Johnson Controls World Serv. Inc.	70	65	69	62
Science Applications International Corp.	28	43	30	58
BAMSI Inc.	58	65	59	55
Ball Aerospace & Tech. Corp.	47	47	47	52
Silicon Graphics	18	27	31	51
Grumman Aerospace Corp.	111	66	58	47
Cortez III Service Corp.	29	38	46	44
Hughes Training Inc.	(a)	(a)	44	43
Hughes STX Corp.	54	48	47	43
Santa Barbara Research Center	82	94	54	41
Aerojet General Corp.	28	40	35	39

Source: National Aeronautics and Space Administration, "Annual Procurement Report" (Annually).
a Not in list of major contractors for indicated year(s).
b Includes awards previously reported separately as Lockheed Space Operations Co and Rockwell Space Operations Inc.
c Includes awards previously reported separately as General Electric Co., Marti Marietta Corp., and Lockheed Missiles & Space Co.
d Previously reported as Rockwell International Corp.
f Includes awards previously reported as Loral Aerospace Corp.

Glossary

Aeronautics: the science that treats of the operation of aircraft, also, the art or science of operating aircraft.

Aerospace Employment: annual average calculated as one-twelfth of sum of monthly estimates of total number of persons employed during a designated pay period by the aircraft, missile, and space industries (SICs 372 and 376) plus estimated aerospace-related employment in the communications equipment (SIC 3662), instruments (SICs 381 and 382), and in certain other industries (SICs 28, 35, 73, 89, etc.)

Aerospace Industry: the industry engaged in research, development, and manufacture of aerospace systems including: manned and unmanned aircraft; missiles; spacecraft; space launch vehicles; propulsion, guidance, and control units for all of the foregoing; and a variety of airborne and ground-based equipment essential to the test, operation, and maintenance of flight vehicles.

Aerospace Payroll: estimated on the basis of average weekly *earnings* for a given calendar year for *production workers* plus an estimated annual salary for other employees.

Aerospace Sales: the *AIA* estimate of aerospace industry sales, developed by summing: *DoD* expenditures for aircraft, missiles, and space-related *procurement* and *RDT&E*; *NASA* expenditures for *research and development* and space flight control and data communications; *outlays* for space activities by other U.S. government departments and agencies; commercial sales of space-related products; net domestic and export sales of civil aircraft, engines, and parts; *Foreign Military Sales* and commercial exports of military aircraft, missiles, propulsion, and related parts; sales of *related products and services* including: electronics, software, and ground support equipment; and sales of *non-aerospace products* which are produced in aerospace-manufacturing *establishments* and which use technology, processes, and materials derived from the *aerospace industry*.

AIA: Aerospace Industries Association of America, Inc., formerly Aircraft Industries Association.

Air Carriers: the commercial system of air transportation, consisting of domestic and international scheduled and charter service.

Aircraft: all airborne vehicles supported either by buoyancy or by dynamic action. Used in this volume in a restricted sense to mean an airplane—any winged aircraft including helicopters, but excluding gliders and guided missiles.

Aircraft Agreement (Agreement on Trade in Civil Aircraft): negotiated the Tokyo Round of the *Multilateral Trade Negotiations* and implemented January 1, 1980, providing for elimination of tariff and non-tariff trade barriers in the civil aircraft sector.

Aircraft Industry: the industry primarily engaged in the manufacture of aircraft, aircraft engines, and parts including propellers and auxiliary equipment. A sector of the *Aerospace Industry*.

Airframe: the structural components of an airplane, such as: fuselage,

empennage, wings, landing gear, and engine mounts, but excluding such items as: engines, accessories, electronics, and other parts that may be replaced from time to time.

Airlines: see *Air Carriers*.

Appropriation (Federal Budget): an act of Congress authorizing an agency to incur *obligations* and make payments out of funds held by the Department of the Treasury.

Assets, Net: the sum of all recorded assets after reducing such amount by allowance of reserve for bad debts, *depreciation*, and amortization, but before deducting any liabilities, mortgages, or other indebtedness.

Astronautics: the art and science of designing, building, and operating manned or unmanned space objects.

Average Weekly Hours: average hours for which pay was received; different from standard or scheduled hours.

Avionics: communications, navigation, flight controls, and displays.

Backlog: the sales value of orders accepted (supported by legal documents) that have not yet passed through the sales account.

Budget Authority: authority provided by the Congress; mainly in the form of *Appropriations*, which allows Federal agencies to incur *obligations* to spend or lend money.

Bureau of Economic Analysis (BEA): an agency of the Department of Commerce.

Bureau of Labor Statistics (BLS): an agency of the Department of Labor.

Bureau of the Census: an agency of the Department of Commerce.

Constant Dollars: calculated by dividing current ("then-year") dollars by appropriate price *deflator* and multiplying the result by 100.

Deflator: index used to convert a price level to one comparable with the price level at a different time, offsetting the effect of inflation. The base period, which equals 100, is usually specified as either a given fiscal or calendar year.

Depreciation: the general conversion of the depreciable cost of a fixed asset into expense, spread over its remaining life. There are a number of methods, all based on a periodic charge to an expense account and a corresponding credit to a reserve account.

Development: the process or activity of working out a basic design, idea, or piece of equipment. See also *Research and Development*.

DoD: Department of Defense.

DoE: Department of Energy.

DoT: Department of Transportation.

Durable Goods Industry: comprised of major manufacturing industry groups with SIC Codes 24, 25, and 32–39. All major manufacturing industry groups in SIC Codes 20–23 and 26–31 are considered nondurable goods manufacturing industry groups.

Earnings: the actual return to the worker for a stated period of time. Irregular bonuses, retroactive items, payments of various welfare benefits, and payroll taxes paid by employers are excluded.

Average Hourly Earnings: on a "gross" basis, reflecting not only changes in basic hourly and incentive wage rates, but also such variable factors as: premium pay for overtime,

late shift work, and changes in output of workers paid for an incentive plan.

Average Weekly Earnings: derived by multiplying *average weekly hours* by *average hourly earnings.*

Establishment: the basis for reporting to the Census of Manufacturers; an operating facility in a single location.

Evaluation (Department of Defense): determination of technical suitability of material, equipment, or a system. See *RDT&E.*

Expenditures (Federal Budget): see *Outlays.*

Export-Import Bank of the United States (Eximbank): created in 1934 and established as an independent U.S. government agency in 1945, Eximbank is designed " . . . to aid in financing and to facilitate *exports* . . . " Eximbank receives no *appropriations* from the U.S. Congress. It is directed by statute to: (1) offer financing that is competitive with that offered exporters of other countries by their official export credit institutions, (2) determine that the transactions supported provide for a reasonable assurance of repayment, (3) supplement, but not compete with private sources of export financing, and (4) take into account the effect of its activities on small business, the domestic economy, and U.S. employment.

Exports: domestic merchandise including commodities which are grown, produced, or manufactured in the United States and commodities of foreign origin which have been changed in the United States from the form in which they were imported or which have been enhanced in value by further manufacture in the United States and which are traded or sold to other nations.

FAA: Federal Aviation Administration (formerly the Federal Aviation Agency), an agency of the Department of Transportation.

Facility: a physical plant or installation including: real property, building, structures, improvements, and plant equipment.

Fiscal Year (Federal Budget): beginning October 1, 1976, the fiscal years run from October 1 through September 30 and are designated by the year in which they end.

Flyaway Value: includes the cost of the airframe, engines, electronics, communications, armament, and other installed equipment.

Foreign Military Sales (FMS): export sales to foreign governments arranged through the Department of Defense, whereby DoD recovers full purchase price and administrative costs; often mistakenly used to include foreign military aid and foreign commercial sales as well.

FY: see *Fiscal Year.*

GDP (Gross Domestic Product): the market value of goods and services produced by labor and property located in the United States.

General Agreement on Tariffs and Trade (GATT): A multilateral treaty among over 100 governments whose primary mission is the reduction of trade barriers. The World Trade Organization was established January 1, 1995 to implement the agreement and provide a forum to discuss trade issues.

General Aviation: all civil flying except that of *air carriers.*

Helicopter: a rotary-wing *aircraft* which depends principally for its support and motion in the air upon the lift generated

by one or more power-driven rotors, rotating on substantially vertical axes. A helicopter is a *V/STOL*.

Heliport: an area, either at ground level or elevated on a structure, that is used for the landing and take-off of helicopters and includes some or all of the various facilities useful to helicopter operations such as: helicopter parking, hangar, waiting room, fueling, and maintenance equipment.

Helistop: a minimum facility *heliport*, either at ground level or elevated on a structure for the landing and takeoff of helicopters, but without such auxiliary facilities as: waiting room, hangar parking, etc.

ICBM: InterContinental Ballistic Missile, with a range of more than 5,000 miles.

Imports: classified as "general imports" or "imports for consumption." This volume refers generally to "imports for consumption," which are entries for immediate consumption plus merchandise withdrawn from bonded storage warehouses for consumption. Data are compiled from Import Entries filed with U.S. Customs officials and are in general based on the market value or price in the foreign country at the time of exportation of such merchandise, including the cost of containers and coverings, as well as other charges and expenses incidental to placing the merchandise in condition, packed and ready for shipment to the United States, but excluding import duties, insurance, freight, and other charges incidental to arrival of the goods in the United States. The foreign values of imported merchandise are converted into U.S. currency at the rate of exchange prevailing on the day the merchandise is shipped to the United States.

Income:

Net Operating Income: total *sales* less total operating costs.

Other Income and Expenses: includes interest income, royalty income, capital gains and losses, interest expense, cash discounts, etc.

Net Income (Before Income Taxes): *Net Operating Income* plus or minus *Other Income and Expenses*.

Net Income (After Income Taxes): *Net Income (Before Income Taxes)* less federal income taxes.

Lump-Sum Wage Payment: a one-time payment given in lieu of general wage increases and/or cost of living adjustments in labor settlements.

Manufacturing Industries: those *establishments* engaged in the mechanical or chemical transformation of inorganic or organic substances into new products, and usually described as plants, factories, or mills, which characteristically use power-driven machines and materials-handling equipment; also *establishments* engaged in assembling component parts of manufactured products if the new product is neither a structure nor other fixed improvement.

Merchandise Trade Balance: the difference between the value of U.S. goods exported to other countries and foreign goods imported into this country. The trade balance is generally regarded as "favorable" when *exports* exceed *imports*—a trade surplus—and "unfavorable" when *imports* exceed *exports*—a trade deficit.

Missile: sometimes applied to space launch vehicles, but more properly connotes automated weapons of warfare, i.e., a weapon which has an integral

system of guidance, as opposed to the unguided rocket.

Multilateral Trade Negotiations (MTN): a forum within the *GATT* in which countries negotiate to overcome their trade problems. Awaiting ratification by each of the 112 nations involved in the MTN, the "Uruguay Round" seeks to strengthen the *GATT* and expand its disciplines to new areas such as: services, agriculture, and trade-related intellectual property rights.

NASA: National Aeronautics and Space Administration.

NATO: North Atlantic Treaty Organization.

New Obligational Authority (Federal Budget): see *Budget Authority*.

Non-Aerospace Products and Services: products and services other than aircraft, missiles, space vehicles, and related propulsion and parts, produced or performed by *establishments* whose principal business is the development and/or manufacture of aerospace products.

OASD: Office of the Assistant Secretary of Defense.

Obligations (Federal Budget): commitments made by Federal agencies to pay out money for products, services, or other purposes—as distinct from the actual payments. Obligations incurred may not be larger than *budget authority*.

Orders, Net New: the sales value of new orders (supported by legal documents) minus cancellations during the period.

Other Aerospace Products and Services: all conversions, modifications, site activation, other aerospace products (including drones), services, plus *research and development* under contract, defined as: basic and applied research in the sciences and in engineering and design and development of prototype products and processes.

Other Customers: all customers other than the U.S. government to include but not limited to: *air carriers*, private citizens and corporations, and state, local, and foreign governments.

Outlays: checks issued, interest accrued on the public debt, or other payments made, net of refunds and reimbursements.

Overtime Hours: that portion of the gross *average weekly hours* which was in excess of regular hours and for which premium payments were made.

Passenger-Mile: one passenger moved one mile.

Payroll, All Manufacturing: includes the gross *earnings* paid in the calendar year to all employees on the payroll of operating manufacturing *establishments*. Includes all forms of compensation paid directly to workers such as: salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind; prior to such deductions as: employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. Does not include employers' Social Security contributions or other non-payroll labor costs such as: employees' pension plans, group insurance premiums, and workmen's compensation.

Procurement: the process whereby the executive agencies of the Federal Government acquire goods and services from enterprises other than the Federal Government.

Production Workers: includes working

foremen and all non-supervisory workers (including lead-men and trainees) engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, janitorial services, product development, auxiliary production for plant's own use, and recordkeeping and services closely associated with the above production operations.

RDT&E (Department of Defense): Research, Development, Test, and Evaluation.

Related Products and Services: sales of electronics, software, and ground equipment in support of aerospace products, plus sales by aerospace manufacturing *establishments* of systems and equipment which are generally derived from the industry's aerospace technological expertise in design, materials, and processes, but which are intended for applications other than flight.

Research: see *Research and Development.*

Research and Development:

Research: systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research is classified as either basic or applied according to the objectives of the sponsoring agency.

Applied Research: with the objective of gaining knowledge or understanding necessary for determining the means by which a recognized and specific need may be met.

Basic Research: with the objective of gaining fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind.

Development: the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems, or methods including design and development of prototypes and processes.

Independent Research and Development (IR&D): a term devised by the Department of Defense and used by Federal agencies to differentiate between a contractor's research and development technical effort performed under a contract, grant, or other arrangement (R&D) and that which is self-initiated and self-funded (IR&D).

Industrial Research and Development: research and development work performed within company facilities, funded by company or Federal funds, and excluding company-financed research and development contracted to outside organizations such as: research institutions, universities and colleges, or other non-profit organizations.

Rotorcraft: an *aircraft* which, in all its usual flight attitudes, is supported in the air wholly or in part by a rotor or rotors (i.e. airfoils rotating or revolving about an axis). See *Helicopter.*

Sales: net of returns, allowances, and discounts, the dollar value of shipments, including dealer's commissions, if any, which have passed through the sales account.

Satellite: a body that revolves around a larger body such as the Moon revolving around the Earth, or a man-made object revolving about any body such as the Sun, Earth, or Moon.

SIC (Standard Industrial Classification): a system developed by the U.S. government to define the industrial composition of the economy, facilitating comparability of statistics. See *Aerospace Industry* for explanation of SIC codes applicable to the aerospace industry.

Space Vehicle: an artificial body operating in outer space (beyond the Earth's atmosphere).

Stockholder's Equity: *assets* minus all obligations of the corporation, except those to stockholders. Annual data are average equity for the year (using four end-of-quarter figures). For details, see "Quarterly Financial Report for Manufacturing, Mining and Trade Corporations," compiled by the *Bureau of the Census*.

STOL: short take-off and landing aircraft.

Test (Department of Defense): an experiment designed to assess progress in attainment or accomplishment of *development* objectives (see *RDT&E*).

Thrust: the driving force exerted by an engine, particularly an aircraft or missile engine, in propelling the vehicle to which it is attached.

Ton-Mile: one ton moved one mile.

Total Obligational Authority: the sum of *budget authority* granted or requested from the Congress in a given year, plus unused *budget authority* from prior years.

Trade Balance: see *Merchandise Trade Balance*.

Transition Quarter (Tr. Qtr.): the three-month interval from July 1, 1976 to September 30, 1976 belonging to neither Fiscal Year 1976 nor Fiscal Year 1977. See *Fiscal Year*.

Turbine, Turbo: a mechanical device or engine that spins in reaction to a fluid flow that passes through or over it. Frequently used in "turboprop" or "turbojet."

UK: United Kingdom.

US: United States of America.

USA: United States Army, an agency of the U.S. Department of Defense.

USAF: United States Air Force, an agency of the U.S. Department of Defense.

USN: United States Navy, an agency of the U.S. Department of Defense.

USSR: Union of Soviet Socialist Republics. Statistics continue to exclude this region until official data from the now independent republics become available.

Utility Aircraft: an aircraft designed for general purpose flying.

V/STOL: vertical short take-off and/or landing aircraft.

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