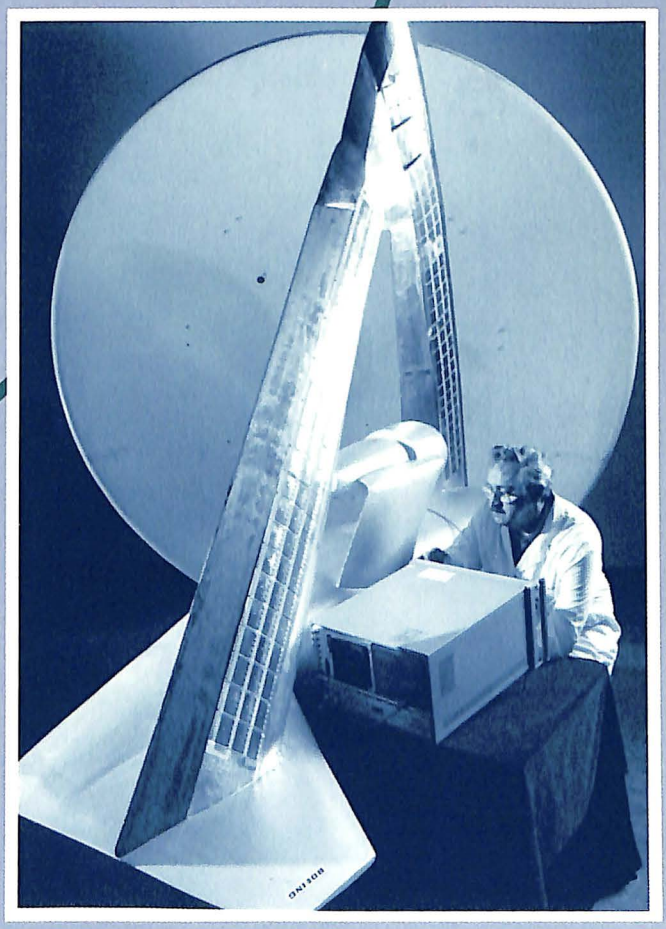
Aerospace



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AEROSPACE

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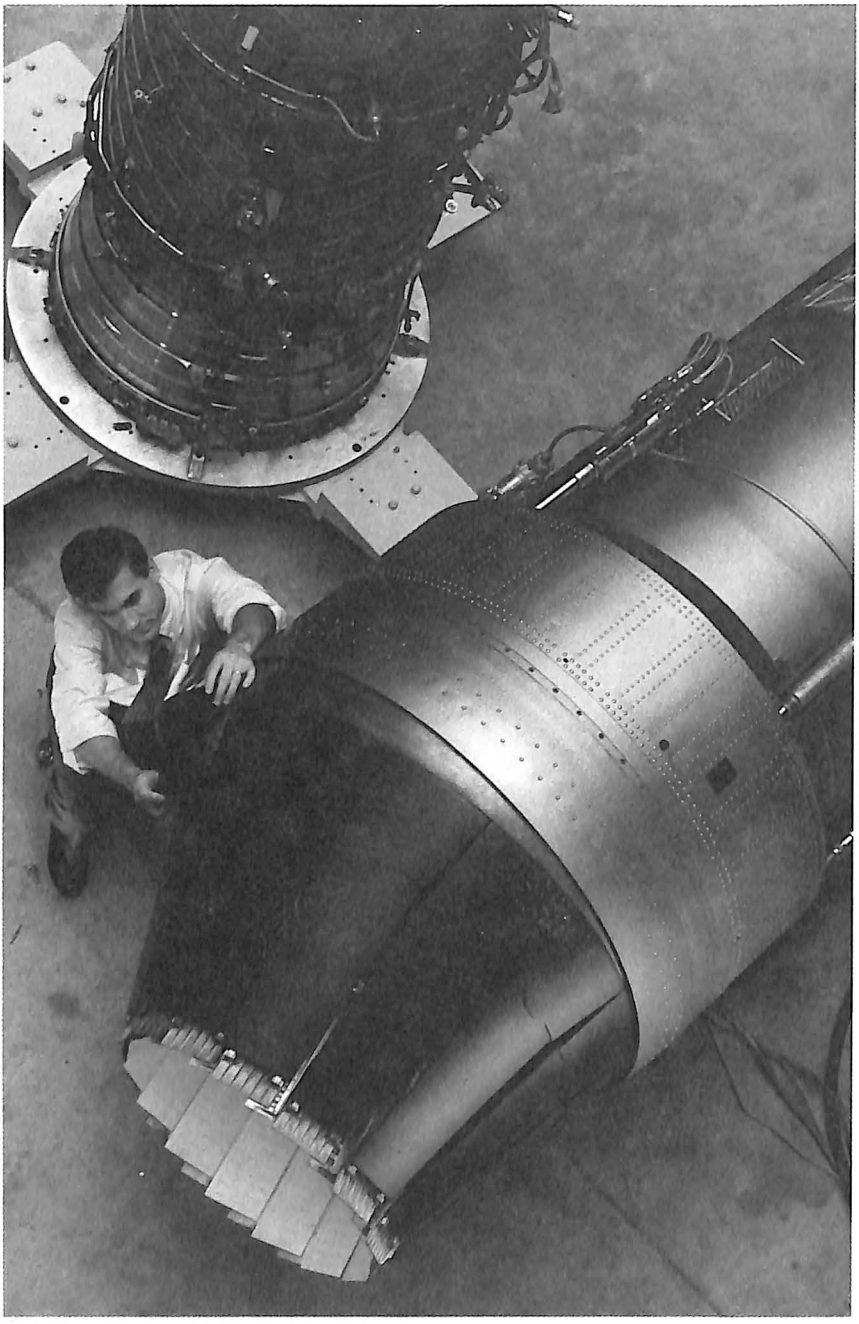

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Foreword

The year 1992 might be characterized as the year in which the long-expected decline in the aerospace industry's sales volume became statistical fact. Defense sales, of course, have been falling off every year since 1987, due to the restructuring and downsizing of the military establishment. But until 1992, rapidly increasing sales in the commercial sector had more than offset the loss of defense business and, as a result, the industry was able to set a new record for overall sales volume each year.

In 1992, however, total sales declined in both current and constant dollars. Commercial business continued to increase, but at a far lower rate; the gain was not sufficient to offset a big drop in defense sales.

The situation regarding new orders for aerospace products is even more ominous. The continuing financial troubles of the world's airlines have caused many carriers to postpone orders for needed new aircraft. This was reflected as a sharp reduction in new orders from non-U.S. government customers in 1992, accompanied by a very large drop (almost 15 percent) in U.S. government (largely military) orders. The industry's total backlog of orders at year-end 1992 was some eight percent below the level of the previous year-end.

The year 1992, therefore, was a year of decline in which the industry experienced reductions in many categories of sales, in orders, backlog and earnings. The export sales area, traditionally the brightest light in our annual statistical report, showed another gain, an eighth consecutive record. But even this bright spot dims on closer scrutiny: the export sales gain amounted to 2.8 percent, as compared with 12 to 22 percent over the preceding five years.

The aerospace industry faces a period of several years where we can expect depressed business in both principal segments of aerospace work load: production of defense systems and manufacture of commercial aircraft.

1993-94

Analysts tell us that the flow of new orders for commercial transports will take a new upturn about 1996. Market projections predict very high levels of jetliner sales in the next decade.

Our defense business, it appears from Administration statements, will decline at an even sharper rate over the next five fiscal years, after which — presumably — the level of industry's defense workload will stabilize.

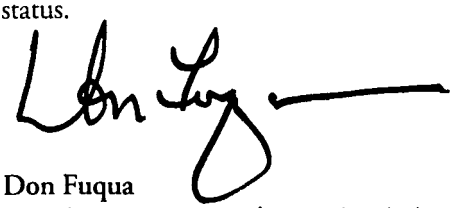
The industry's task, therefore, is to weather the period until the late years of the century when expanding commercial business, and perhaps increased space workload, will offset some of the lost military business.

But more is needed: if we are to maintain an industrial base adequate to the needs of defense expansion in an emergency, and U.S. competitiveness in the international sales arena, we must find alternative workload to take up more of the slack.

Our main hope is expansion of export sales in the reinvigorated global aerospace market we expect to see when the world economic environment approves. We hope, too, that we will find significant additional workload through government assignment to industry of a greater share of the depot maintenance work now performed largely by the Department of Defense. There is also potential for new workload in diversification, branching out into new non-defense product lines where our existing high technology capability can be effectively employed.

We are backing our efforts to expand our workload, and thereby to maintain "warm" production facilities staffed by an adequate labor force, with a dedicated program of cutting costs and effecting new efficiencies to improve the industry's competitive posture.

We face a difficult but not insurmountable period of adjustment. We are forced by circumstance to make a transition from a large defense-focused industry to a smaller, commercially-oriented industry. Our goal for the remaining years of this century is to manage the transition effectively and to aggressively redevelop the aerospace industry, retaining to the extent possible its unique capabilities and maintaining its world leadership status.



Don Fuqua
President, Aerospace Industries Association

Aerospace Summary

Aerospace industry sales to the Department of Defense (DoD) continued to decline in 1992. Non-U.S. government or commercial sales continued to increase, but at a far lower rate than the boomlike boosts of 1990/91. As a result, total industry sales declined by some $1.3 billion. Perhaps even more significant was the continuing decline in new orders. For the third consecutive year, orders dropped sharply. Both the U.S. government and non-U.S. government sectors received fewer orders, auguring further reduced production in future years in the industry's two principal areas of business: military systems and commercial aircraft. Thus, 1992 was a year of decline in terms of sales, earnings, orders and backlog. The industry did show positive results with its eighth straight export record, but even in that area growth was significantly less than in recent years.

Here is a breakdown of the industry's performance in 1992:

Sales: Total industry sales amounted to $137.9 billion, a decline from the previous year's $139.2 billion. The DoD continued to be the industry's major customer despite five years of declining sales; work for DoD accounted for $51.8 billion or 38 percent of the total. Sales to "other customers," principally commercial airlines, were $50.9 billion, just under 37 percent of the total.

Aircraft sector sales predominated as usual. Sales of aircraft, engines and parts, civil and military combined, totaled $73.6 billion, down from $75.9 billion in 1991. For the first time since 1980, sales of civil aircraft ($39.9 billion) topped sales of military aircraft ($33.7 billion). Overall aircraft sales represented 53 percent of total sales.

At $29.8 billion, sales of space systems were up only slightly over 1991's $29.2 billion and showed a decline after accounting for inflation. Military and civil space sales constituted more than 21 percent of the industry's total sales. Sales of missile systems increased to $11.6 billion from the previous year's $11 billion. Related products and services sales totaled $23 billion, down from $23.2 billion.

For 1992, aerospace industry sales amounted to 2.3 percent of the Gross Domestic Product (down from 2.5 percent) and 4.7 percent of total sales by all U.S. manufacturing industries (down from 4.9 percent).

Earnings: The aerospace industry posted a net loss after taxes of $1.8 billion in 1992. Many companies elected to write off large amounts necessary to comply with a new government standard for accounting for employees' post-retirement benefits. Industry-wide, these non-operating expenses totaled $8.7 billion. Reflected in the balance sheet as an increase in liabilities at the expense of stockholders' equity, these set-asides reduced the industry's $6.9 billion operating profit to a net loss of $1.8 billion. Because of the accounting change, that figure is not directly comparable with prior year earnings. The most valid comparison is the operating profit of $6.9 billion, which compares with $7.6 billion in 1991 (the latter figure was based on total sales $0.8 billion higher than the 1992 level).

The aerospace balance sheet, as reported by the Bureau of the Census, showed an increase in net working capital from $14.5 billion in 1991 to $15.2 billion in 1992. Total assets, however, declined from $131 billion in 1991 to $127.8 billion in 1992.

Orders and Backlog: For the third consecutive year, new orders for aerospace systems plunged sharply in nearly every segment of industry activity, including both U.S. and non-U.S. government business. Total new orders in 1992 amounted to $103.5 billion, a decline of more than 15 percent from the 1991 level of $122.5 billion. Orders from the U.S. government, at $56.8 billion (down from $66.4 billion), constituted almost 55 percent of the total. Non-U.S. government orders, primarily orders for civil transports, amounted to $46.8 billion, compared with $56.1 billion in the previous year.

The industry backlog at year-end amounted to $225.7 billion, approximately eight percent below the 1991 backlog. Non-U.S. government

orders, at $144.5 billion, constituted 64 percent of the total, compared with $158.7 billion a year earlier. Unfilled orders from the U.S. government totaled $81.2 billion, down from $88.6 billion.

Civil Aircraft Production: In 1992, U.S. manufacturers produced only 1,790 aircraft, the lowest number in post-World War II history; it compares with 2,181 in 1991. The 1992 figure included 567 transport aircraft (down from 589), 324 helicopters (down from 571), and 899 general aviation aircraft (down from 1,021). The latter figure was also a postwar low. In terms of sales value, the industry posted a moderate increase due to a higher dollar level in the transport category, which since the mid-1980s has accounted for more than 80 percent of the total value. Overall civil aircraft shipments were valued at $30.7 billion, compared with $29 billion in 1991.

Sales of transport aircraft amounted to $28.8 billion, up from $26.9 billion; transport sales constituted more than 93 percent of the total civil aircraft sales volume. Civil helicopter sales slumped sharply in dollar value as well as numbers. Shipments in 1992 are valued at $142 million, down from $211 million in the previous year. Sales of general aviation aircraft totaled $1.8 billion, down from $2 billion in 1991.

Total backlog for all aircraft, engines and parts, civil and military, dropped to $153.1 billion from 1991's $173.7 billion. The year-end backlog for commercial transport aircraft fell to $96.7 billion, compared with $108.8 billion at the end of 1991. Foreign orders worth $66.8 billion constituted 69 percent of the transport backlog.

Military Aircraft Production: The industry produced 780 military aircraft in 1992, down from 919 in 1991; it was the lowest number produced in any year since the pre-World War II year of 1935. Production included 401 aircraft delivered to U.S. military agencies and 379 exported under Foreign Military Sales programs or through direct sales by U.S. manufacturers to foreign governments. The comparable figures for the previous year were 556 delivered to U.S. military agencies, and 363 exported.

Foreign Trade: The industry recorded its eighth straight export record and its sixth straight record trade balance. Exports, however, increased at a much more moderate pace than in recent years.

Aerospace exports topped $45 billion, up from $43.8 billion in 1991, but a gain of only 2.8 percent compared with the previous year's 12 percent. Aerospace imports increased more than five percent to $13.7 billion. The trade balance came to $31.4 billion, up less than two percent from 1991's $30.8 billion. Civil exports continued to account for the bulk of all aerospace exports — more than 80 percent in 1992. The industry exported civil products valued at $36.9 billion, which compares with $35.5 billion in 1991. Roughly two-thirds of the civil export dollar value was in sales of complete aircraft, principally airline transports. Military exports, at $8.1 billion, were down slightly from $8.2 billion.

Space Systems: The steady rise in sales of space systems the industry had been experiencing for three decades faltered in 1992. AIA figures showed sales at $29.8 billion, technically a record high but a slight decline in constant dollars.

The Bureau of Census reported space system sales (excluding propulsion) of $10 billion, down from 1991's $10.5 billion. At $5.9 billion, military space sales constituted 59 percent of the total, compared with $6.8 billion in 1991. Sales of non-military space systems (NASA, other government agencies and commercial systems) increased 11 percent to $4.1 billion (up from $3.7 billion).

A big jump in military orders caused an increase in civil/military orders for space systems (again excluding propulsion). Census reported total orders at $12 billion, up from $11.2 billion in 1991. The military space component was $7.2 billion, up from $5.5 billion. Non-military orders fell from $5.8 billion in 1991 to $4.8 billion. At year-end 1992, the civil/military backlog for space systems was $13.5 billion, an all-time high that compares with $11.7 billion at the end of 1991. Military backlog was 57 percent of the total.

Missile Systems: For the first time since 1987, sales of missile systems and parts, excluding propulsion (reported separately in Bureau of the Census data), increased in 1992. Missile systems and parts rose by nearly $500 million to $9.5 billion compared to 1991's $9 billion. The industry also experienced an increase in new orders for missile systems. Census reported 1992 orders worth $9.5 billion, compared with $8.1 billion in 1991. The year-end 1992 missile system backlog (again excluding propulsion) was $12.8 billion, up from $12.6 billion.

Research and Development: Total U.S. funding for research and development (R&D) reached $154.5 billion in 1992, up from $145.4 billion in 1991, according to the National Science Foundation (NSF). Industry provided $81.1 billion, or 52 percent of the funding. Industry performed 70 percent of the R&D by dollar value. Federal government facilities performed 11 percent and colleges/universities 12 percent. For 1993, NSF estimated the national R&D total at $160.8 billion and projected that industry would again lead all funding sources with $83.6 billion. NSF predicted that industry would accomplish 70 percent of the R&D, colleges/universities 12.8 percent and federal facilities 10 percent.

The Office of Management and Budget (OMB) estimated federally-funded R&D for Fiscal Year 1993 at $68.6 billion, a six percent increase over the previous year's $64.7 billion. Estimates show that the DoD is providing 55 percent of all federally funded R&D with outlays of $38.1 billion. NASA funding, at $7.8 billion, represents 11 percent. Department of Energy funding is $6 billion.

Employment: Industry employment declined for the third straight year. Average annual employment dropped to 1,098,000 from the previous year's 1,214,000, a decline of 10 percent. The aerospace labor force represented six percent of the total employment in all U.S. manufacturing industries and 10.6 percent of the total employed by U.S. companies producing durable goods. At $33.2 billion, the industry's payroll was down 4.2 percent from 1991's $34.7 billion. Average weekly earnings came to $694, up from $657 in 1991; average hourly earnings were $16.69, up from $15.71.

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 define the industrial composition of the economy, facilitating comparability of statistics. It is revised periodically to reflect the changing industrial composition of the economy.
NEC: Not elsewhere classified.

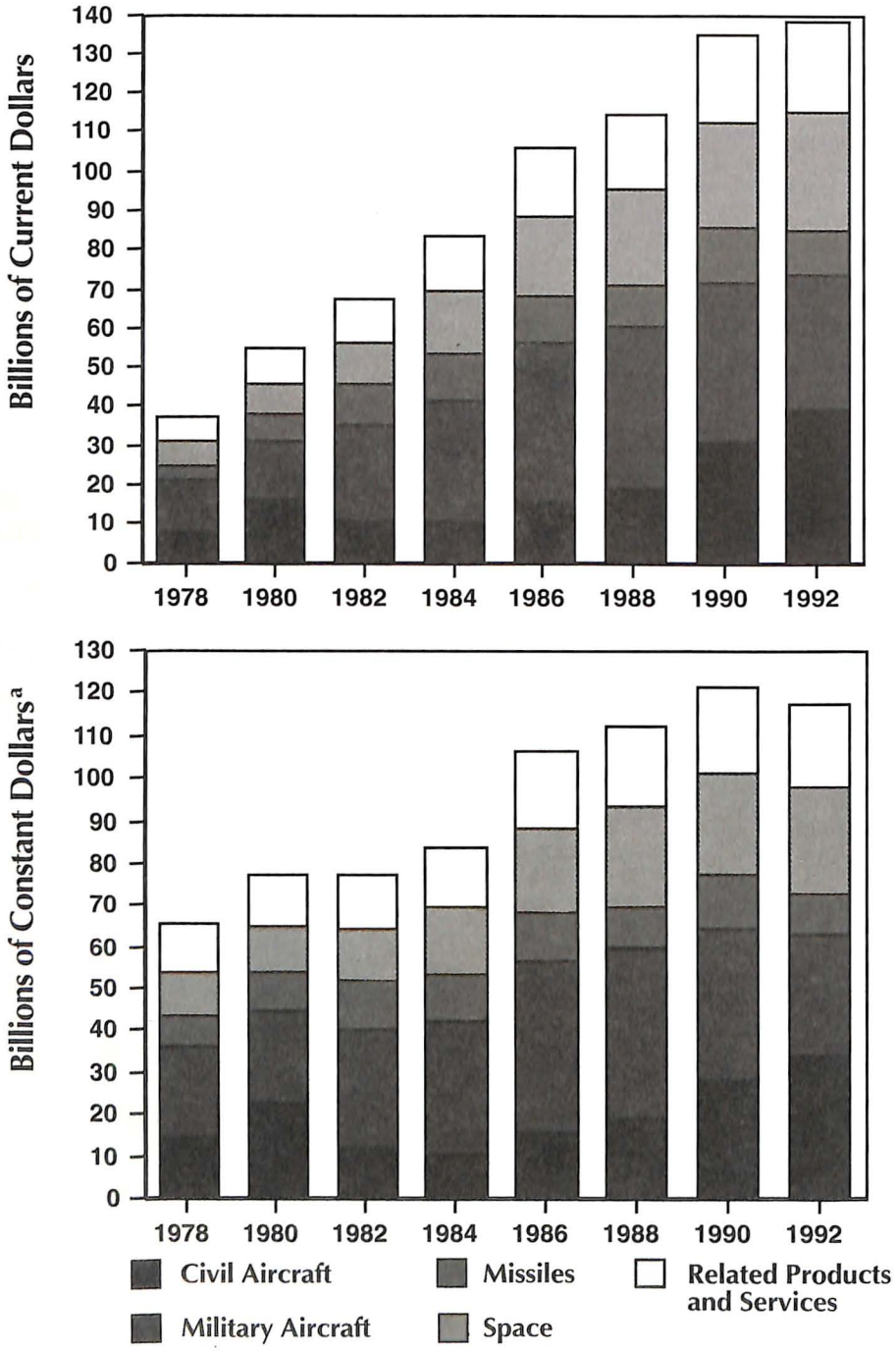
AEROSPACE INDUSTRY SALES BY CUSTOMER

Calendar Years 1978–1992
(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						
1978	$ 37,702	$ 30,889	$15,533	$ 3,151	$12,205	$ 6,813
1979	45,420	37,705	18,918	3,453	15,334	7,715
1980	54,697	45,878	22,795	4,106	18,977	8,819
1981	63,974	53,090	27,244	4,709	21,137	10,884
1982	67,756	56,366	34,016	4,899	17,451	11,390
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 [r]	139,248	116,040	56,619	11,739	48,379	23,208
1992	137,944	114,953	51,783	12,287	50,883	22,991
CONSTANT DOLLARS (1987 = 100)[a]						
1978	$ 65,569	$ 53,720	$27,014	$ 5,480	$21,226	$11,849
1979	71,528	59,378	29,792	5,438	24,148	12,150
1980	77,475	64,983	32,288	5,816	26,880	12,492
1981	80,470	66,780	34,269	5,923	26,587	13,691
1982	77,083	64,125	38,699	5,573	19,853	12,958
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 [r]	121,508	101,257	49,406	10,243	42,216	20,251
1992	117,499	97,916	44,108	10,466	43,342	19,583

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.
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 1978–1992
(Millions of Dollars)

Year	TOTAL SALES	Aircraft			Missiles	Space	Related Products & Services
		Total	Civil	Military			
CURRENT DOLLARS							
1978	$ 37,702	$21,074	$ 8,222	$12,852	$ 4,098	$ 5,717	$ 6,813
1979	45,420	26,382	13,227	13,155	4,778	6,545	7,715
1980	54,697	31,464	16,285	15,179	6,469	7,945	8,819
1981	63,974	36,062	16,427	19,635	7,640	9,388	10,884
1982	67,756	35,484	10,982	24,502	10,368	10,514	11,390
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	31,362	40,091	14,180	26,446	22,396
1991[r]	139,248	75,918	37,443	38,475	10,970	29,152	23,208
1992	137,944	73,647	39,898	33,749	11,550	29,757	22,991
CONSTANT DOLLARS (1987 = 100)[a]							
1978	$ 65,569	$36,650	$14,299	$22,351	$ 7,127	$ 9,943	$11,849
1979	71,528	41,546	20,830	20,717	7,524	10,307	12,150
1980	77,475	44,567	23,067	21,500	9,163	11,254	12,492
1981	80,470	45,361	20,663	24,698	9,610	11,809	13,691
1982	77,083	40,369	12,494	27,875	11,795	11,961	12,958
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	28,382	36,281	12,833	23,933	20,268
1991[r]	121,508	66,246	32,673	33,573	9,572	25,438	20,251
1992	117,499	62,732	33,985	28,747	9,838	25,347	19,583

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.
r Revised.

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

Calendar Years 1978–1992
(Millions of Dollars)

Year	GRAND TOTAL	TOTAL		Aircraft, Engines, & Parts		Missiles, Space, & Rocket Propulsion	Other Aerospace		Non-Aerospace
		U.S. Gov't	Other	U.S. Gov't	Other		U.S. Gov't	Other	
CURRENT DOLLARS									
1978	$ 37,968	$21,888	$16,080	$ 8,724	$10,581	$ 6,380[a]	$ 3,363	$2,107[a]	$ 6,813
1979	46,173	23,299	22,944	8,649	16,023	7,197	3,930	2,659	7,715
1980	58,440	26,674	31,766	9,427	20,097	8,393	6,869	2,609	11,045
1981	69,944	33,039	36,905	12,047	21,527	9,722	8,155	3,384	15,109
1982	75,487	42,239	33,248	15,120	16,766	11,980	9,909	4,953	16,759
1983	83,453	49,056	34,397	17,074	18,805	12,745	12,685	2,804	19,340
1984	88,941	55,777	33,164	20,216	17,069	13,624	12,734	2,768	22,530
1985	100,522	63,532	36,990	21,899	22,041	16,741	15,228	2,938	21,675
1986	105,577	65,326	40,251	22,755	25,002	17,535	16,243	3,564	20,478
1987	110,301	68,632	41,669	23,769	25,293	20,715	15,413	3,802	21,309
1988	113,548	68,104	45,444	21,316	29,426	21,514	16,103	3,225	21,964
1989	122,148	72,184	49,964	21,371	32,454	22,643	16,661	3,852	25,167
1990	136,646	73,552	63,094	24,614	41,675	22,040	15,862	4,253	28,202
1991[r]	123,862	67,180	56,682	21,724	46,816	23,311	13,735	4,018	14,258
1992	121,852	62,888	58,964	20,314	47,575	22,563	12,990	4,055	14,355
CONSTANT DOLLARS (1987 = 100)[b]									
1978	$ 66,031	$38,066	$27,965	$15,172	$18,402	$11,096	$ 5,849	$3,664	$11,849
1979	72,713	36,691	36,132	13,620	25,233	11,334	6,189	4,187	12,150
1980	82,776	37,782	44,994	13,353	28,466	11,888	9,729	3,695	15,644
1981	87,980	41,558	46,421	15,153	27,078	12,229	10,258	4,257	19,005
1982	85,878	48,053	37,825	17,201	19,074	13,629	11,273	5,635	19,066
1983	90,513	53,206	37,307	18,518	20,396	13,823	13,758	3,041	20,976
1984	89,119	55,889	33,230	20,257	17,103	13,651	12,760	2,774	22,575
1985	101,846	64,369	37,477	22,187	22,331	16,961	15,429	2,977	21,960
1986	105,789	65,457	40,332	22,801	25,052	17,570	16,276	3,571	20,519
1987	110,301	68,632	41,669	23,769	25,293	20,715	15,413	3,802	21,309
1988	111,431	66,834	44,597	20,919	28,877	21,113	15,803	3,165	21,554
1989	115,125	68,034	47,091	20,142	30,588	21,341	15,703	3,631	23,720
1990	123,662	66,563	57,099	22,275	37,715	19,946	14,355	3,849	25,522
1991[r]	108,082	58,621	49,461	18,956	40,852	20,341	11,985	3,506	12,442
1992	103,792	53,567	50,225	17,303	40,524	19,219	11,065	3,454	12,227

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)," Series MA37D (Annually).
a AIA estimate based on M37D data.
b Based on AIA's aerospace composite price deflator.
r Revised.

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

Calendar Years 1978–1992
(Millions of Dollars)

Year	GRAND TOTAL	TOTAL		Aircraft, Engines, & Parts		Missiles, Space, & Rocket Propulsion	Other Aerospace		Non-Aerospace
		U.S. Gov't	Other	U.S. Gov't	Other		U.S. Gov't	Other	
NET NEW ORDERS									
1978	$ 49,819	$ 25,992	$ 23,827	$11,150	$ 16,961	$ 7,072[b]	$ 4,631	$2,450[b]	$ 7,555
1979[a]	67,561[a]	28,107	37,101	8,762	30,695	7,609	5,184	4,487	8,471
1980	69,624	33,496	36,128	16,555	18,123	9,818	8,528	4,081	12,519
1981	74,922	42,431	32,491	16,946	17,911	12,376	9,350	3,250	15,089
1982[a]	89,168[a]	58,849[a]	30,319[a]	20,547	13,591	13,988	13,643	4,762	20,369
1983	91,647	60,290	31,357	22,171	16,428	14,248	15,209	2,641	20,950
1984	104,863	66,968	37,895	25,829	21,273	16,485	14,050	3,461	23,765
1985	110,968	70,240	40,728	23,751	26,191	20,328	14,730	2,800	23,168
1986	110,836	68,001	42,835	21,642	26,315	20,445	16,439	3,907	22,088
1987	121,224	66,264	54,960	17,019	35,328	26,272	13,899	4,658	24,048
1988	147,128	67,850	79,278	19,611	62,537	20,240	18,174	3,293	23,273
1989	173,635	80,633	93,002	25,421	71,170	26,820	17,713	4,046	28,465
1990	145,965	56,264	89,701	15,541	66,845	20,207	13,014	3,487	26,871
1991[r]	122,485	66,410	56,075	22,674	44,816	23,311	10,953	4,736	14,351
1992	103,547	56,764	46,783	16,039	33,726	22,563	11,729	4,000	13,444
BACKLOG AS OF DECEMBER 31									
1978	$ 57,160	$ 30,223	$ 26,937	$14,897	$ 18,972	$ 7,557	$ 4,029	$3,668	$ 8,037
1979[a]	78,548[a]	36,136	42,123	17,316	33,168	7,388	5,613	5,112	9,662
1980	89,732	37,199	52,533	17,435	39,800	8,941	8,421	5,127	10,008
1981	94,710	46,591	48,119	21,292	35,022	11,255	9,052	4,940	13,149
1982[a]	108,391[a]	63,201[a]	45,190[a]	26,644	31,920	13,262	13,268	4,269	16,760
1983	116,585	74,435	42,150	30,688	29,684	14,962	18,489	3,684	19,078
1984	132,507	85,626	46,881	36,312	33,877	17,823	19,684	4,498	20,313
1985	142,953	92,334	50,619	38,150	38,041	21,410	18,937	4,609	21,806
1986	148,212	95,009	53,203	37,041	38,350	24,320	19,133	4,952	23,416
1987	158,650	92,439	66,211	30,323	49,692	30,544	17,888	5,653	24,550
1988	191,518	92,394	99,124	28,412	82,868	29,078	19,822	5,496	25,842
1989	252,401	107,797	144,604	36,320	122,830	33,771	23,558	8,280	27,642
1990	250,079	82,017	168,062	26,911	146,029	31,648	17,865	5,635	21,991
1991[r]	245,241	86,566	158,675	31,176	142,500	32,657	16,365	5,755	16,788
1992	225,719	81,241	144,478	26,845	126,299	35,301	15,084	6,756	15,434

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)" Series MA37D (Annually).
a 1979 and 1982 Orders and Backlog Totals are final revisions for which product group detail is not available.
b AIA estimate based on M37D data.
r Revised.

AEROSPACE SALES AND THE NATIONAL ECONOMY

Calendar Years 1978–1992
(Billions of Dollars)

Year	Gross Domestic Product	Industry Sales			Aerospace Sales As Percent of		
		Manufacturing[a]	Durable Goods[a]	Aerospace	GDP	Manufacturing	Durable Goods
CURRENT DOLLARS							
1978	$2,232.7	$1,522.9	$ 812.8	$ 37.7	1.7	2.5	4.6
1979	2,488.6	1,727.2	911.1	45.4	1.8	2.6	5.0
1980	2,708.0	1,852.7	929.0	54.7	2.0	3.0	5.9
1981	3,030.6	2,017.5	1,004.7	64.0	2.1	3.2	6.4
1982	3,149.6	1,960.2	950.5	67.8	2.2	3.5	7.1
1983	3,405.0[r]	2,070.6	1,025.8	80.0	2.3	3.9	7.8
1984	3,777.2	2,288.2	1,175.3	83.5	2.2	3.6	7.1
1985	4,038.7	2,334.5	1,215.4	96.6	2.4	4.1	7.9
1986	4,268.6	2,335.9	1,238.9	106.2	2.5	4.5	8.6
1987	4,539.9	2,475.9	1,297.5	110.0	2.4	4.4	8.5
1988	4,900.4	2,682.5	1,415.9	114.6	2.3	4.3	8.1
1989	5,250.8[r]	2,792.7	1,460.4	120.5	2.3	4.3	8.3
1990	5,522.2[r]	2,873.5	1,468.6	134.4	2.4	4.7	9.1
1991	5,677.5[r]	2,821.7	1,422.6	139.2[r]	2.5	4.9	9.8
1992	5,943.1	2,926.0	1,496.6	137.9	2.3	4.7	9.2

CONSTANT DOLLARS (1987 = 100)[a]					Real Annual Growth[b]			
					GDP	Mfg.	Durs.	Aero.
1978	$3,703.3	$2,525.9	$1,348.1	$ 65.6	4.8%	3.9%	6.1%	11.2%
1979	3,796.5	2,635.0	1,390.0	71.5	2.5	4.3	3.1	9.1
1980	3,776.3	2,583.6	1,295.5	77.5	(0.5)	(2.0)	(6.8)	8.3
1981	3,843.0	2,558.4	1,274.1	80.5	1.8	(1.0)	(1.7)	3.9
1982	3,760.3	2,340.3	1,134.8	77.1	(2.2)	(8.5)	(10.9)	(4.2)
1983	3,906.6[r]	2,375.6	1,176.9	86.7	3.9	1.5	3.7	12.5
1984	4,148.5	2,513.1	1,290.8	83.7	6.2	5.8	9.7	(3.6)
1985	4,279.6	2,473.7	1,287.9	97.8	3.2	(1.6)	(0.2)	17.0
1986	4,404.3	2,410.1	1,278.2	106.4	2.9	(2.6)	(0.7)	8.7
1987	4,539.9	2,475.9	1,297.5	110.0	3.1	2.7	1.5	3.4
1988	4,718.7	2,583.0	1,363.4	112.4	3.9	4.3	5.1	2.2
1989[r]	4,839.4	2,573.9	1,346.0	113.6	2.6	(0.4)	(1.3)	1.0
1990[r]	4,878.3	2,538.4	1,297.4	121.6	0.8	(1.4)	(3.6)	7.0
1991[r]	4,819.6	2,395.3	1,207.6	121.5	(1.2)	(5.6)	(6.9)	(0.1)
1992	4,915.7	2,420.2	1,237.9	117.5	2.0	1.0	2.5	(3.3)

Source: Bureau of Economic Analysis, "Business Statistics" and "Survey of Current Business" (Monthly); and Aerospace Industries Association.

a Aerospace industry constant dollar sales based on AIA's aerospace composite price deflator. Others based on GDP implicit price deflator.

b Parentheses indicate negative real annual growth.

r Revised.

GROSS DOMESTIC PRODUCT, FEDERAL BUDGET, AND DEFENSE BUDGET

Fiscal Years 1962–1994
(Billions of Dollars)

Year	Fiscal Year GDP	Federal Budget Outlays		Defense Outlays as percent of	
		Net Total[a]	National Defense[b]	GDP	Federal Budget
1962	$ 554.3	$ 106.8	$ 52.3	9.4%	49.0%
1963	585.0	111.3	53.4	9.1	48.0
1964	626.5	118.5	54.8	8.7	46.2
1965	671.4	118.2	50.6	7.5	42.8
1966	738.6	134.5	58.1	7.9	43.2
1967	791.3	157.5	71.4	9.0	45.4
1968	849.8	178.1	81.9	9.6	46.0
1969	926.6	183.6	82.5	8.9	44.9
1970	985.6	195.6	81.7	8.3	41.8
1971	1,051.6	210.2	78.9	7.5	37.5
1972	1,145.8	230.7	79.2	6.9	34.3
1973	1,278.0	245.7	76.7	6.0	31.2
1974	1,403.3	269.4	79.3	5.7	29.5
1975	1,511.0	332.3	86.5	5.7	26.0
1976	1,685.1	371.8	89.6	5.3	24.1
Tr.Qtr.	444.9	96.0	22.3	5.0	23.2
1977	1,919.7	409.2	97.2	5.1	23.8
1978	2,156.4	458.7	104.5	4.8	22.8
1979	2,431.9	503.5	116.3	4.8	23.1
1980	2,644.5	590.9	134.0	5.1	22.7
1981	2,964.7	678.2	157.5	5.3	23.2
1982	3,124.9	745.8	185.3	5.9	24.8
1983	3,317.0	808.4	209.9	6.3	26.0
1984	3,696.7	851.8	227.4	6.2	26.7
1985	3,970.9	946.4	252.7	6.4	26.7
1986	4,219.6	990.3	273.4	6.5	27.6
1987	4,453.3	1,003.9	282.0	6.3	28.1
1988	4,810.0	1,064.1	290.4	6.0	27.3
1989	5,170.1	1,144.2	303.6	5.9	26.5
1990	5,459.5	1,251.8	299.3	5.5	23.9
1991	5,626.6	1,323.0	273.3	4.9	20.7
1992	5,869.6	1,380.9	298.4	5.1	21.6
1993[E]	6,172.5	1,467.6	290.6	4.7	19.8
1994[E]	6,506.9	1,515.3	276.9	4.3	18.3

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 FY 1985, the Federal Budget reflects establishment of a military retirement trust fund. Data for prior years adjusted for comparable treatment of military retired pay.
E Estimate.
Tr.Qtr. See Glossary.

FEDERAL OUTLAYS
DEFENSE, NASA, AND AEROSPACE PRODUCTS & SERVICES

Fiscal Years 1966–1994
(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	
1966	$ 58,111	$ 5,933	$14,065	$ 8,704	$ 5,361	22.0%
1967	71,417	5,426	15,478	10,341	5,137	20.1
1968	81,926	4,724	16,279	11,681	4,598	18.8
1969	82,497	4,252	15,872	11,686	4,186	18.3
1970	81,692	3,753	14,559	10,860	3,699	17.0
1971	78,872	3,382	12,918	9,580	3,338	15.7
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	11,052	52,933	42,072	10,861	16.8
1990	299,331	12,429	53,202	40,992	12,210	17.1
1991	273,292	13,878	53,640	40,098	13,551	18.7
1992	298,350	13,961	50,647	37,085	13,562	16.2
1993[E]	290,617	14,079	45,711	32,213	13,498	15.0
1994[E]	276,869	14,625	42,872	28,787	14,085	14.7

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.

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

Tr.Qtr. See Glossary.

FEDERAL OUTLAYS FOR AEROSPACE PRODUCTS AND SERVICES

Fiscal Years 1966–1994
(Millions of Dollars)

Year	TOTAL	Department of Defense[a]			NASA[b]
		TOTAL	Aircraft	Missiles[c]	
1966	$14,065	$ 8,704	$ 6,635	$ 2,069	$ 5,361
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	58,808	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	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	53,202	40,992	26,142	14,851	12,210
1991	53,640	40,089	25,689	14,400	13,551
1992	50,647	37,085	23,581	13,504	13,562
1993[E]	45,711	32,213	20,107	12,106	13,498
1994[E]	42,872	28,787	19,276	9,511	14,085

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 1978 and subsequent years revised by AIA from previously published data to include Navy Weapons Procurement in Missiles Procurement. Beginning 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 1985–1994
(Millions of Dollars)

	1985	1986	1987
TOTAL	$245,154	$265,480	$273,966
Procurement—TOTAL	$ 70,381	$ 76,517	$ 80,744
Aircraft	26,586	30,828	32,956
Missiles[b]	10,749	11,730	11,473
Ships	9,145	9,501	9,316
Weapons[b]	3,801	4,343	4,962
Ammunition	2,080	1,933	2,111
Other[c]	18,020	18,182	19,926
Military Personnel—TOTAL	67,842	71,511	72,020
Active Forces	60,344	63,139	63,810
Reserve Forces	7,498	8,373	8,210
Research, Development, Test, & Evaluation	27,103	32,283	33,596
Operations & Maintenance	72,371	75,288	76,205
Military Construction	4,260	5,067	5,853
Family Housing	2,642	2,819	2,908
Other	553	1,995	2,640

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.

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

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

Fiscal Years 1985–1994
(Millions of Dollars)

1988	1989	1990	1991	1992	1993[E]	1994[E]
$281,935	$294,880	$289,755	$306,806	$286,633	$277,304	$264,225
$ 77,166	$ 81,620	$ 80,972	$ 82,028	$ 74,882	$ 68,511	$ 62,173
28,246	27,569	26,142	25,689	23,581	20,107	19,276
11,676	14,503	14,851	14,400	13,504	12,106	9,511
8,878	10,587	11,016	11,512	11,035	9,638	8,785
4,727	4,384	3,873	3,716	3,324	2,829	2,183
2,250	1,993	2,003	2,103	1,996	1,327	1,202
21,389	22,585	23,088	24,609	21,442	22,504	21,216
76,337	80,676	75,622	83,439	81,171	75,965	70,155
67,642	71,571	66,541	74,571	71,433	66,839	61,032
8,694	9,104	9,081	8,868	9,738	9,126	9,123
34,792	37,002	37,458	34,589	34,632	37,328	38,215
84,475	87,001	88,340	101,769	92,042	91,100	89,093
5,874	5,275	5,080	3,497	4,262	5,283	5,321
3,082	3,257	3,501	3,296	3,271	3,504	3,666
210	50	(1,218)	(1,812)	(3,626)	(4,387)	(4,397)

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

(1964–1994)

Year	GDP		Federal Government Defense Purchases		PPI, Capital Equipment	CPI, (Urban) All items
	FY GDP (FY 1987 =100)	CY GDP (CY 1987 =100)	Durable Goods (FY 1987 =100)	Goods & Services (CY 1987 =100)	(CY 1982 =100)	(CY 82-84 =100)
1964	27.64	27.7	NA	NA	33.4	31.0
1965	28.27	28.4	NA	NA	33.8	31.5
1966	29.07	29.4	NA	NA	34.6	32.4
1967	30.06	30.3	NA	NA	35.8	33.4
1968	31.20	31.8[r]	NA	NA	37.0	34.8
1969	32.79	33.3	NA	NA	38.3	36.7
1970	34.57	35.1	NA	NA	40.1	38.8
1971	36.34	37.0	NA	NA	41.7	40.5
1972	38.23	38.8	46.7	36.9	42.8	41.8
1973	40.22	41.3	47.5	40.5	44.2	44.4
1974	43.27	44.9	49.7	44.5	50.5	49.3
1975	47.58	49.2	53.9	48.5	58.2	53.8
1976	51.22	52.3	57.4	51.9	62.1	56.9
1977	55.38	55.9	61.5	55.6	66.1	60.6
1978	59.57	60.3	64.8	59.8	71.3	65.2
1979	64.74	65.6[r]	70.5	65.8	77.5	72.6
1980	70.58	71.7	78.1	73.5	85.8	82.4
1981	77.76	78.9	87.4	81.1	94.6	90.9
1982	83.55	83.8	96.3	87.6	100.0	96.5
1983	87.02	87.2	100.4	91.6	102.8	99.6
1984	90.85	91.0	104.3	94.8	105.2	103.9
1985	94.32	94.4	103.9	97.3	107.5	107.6
1986	97.12	96.9	104.7	98.6	109.7	109.6
1987	100.00	100.0	100.0	100.0	111.7	113.6
1988	103.63	103.9	101.4	103.0	114.3	118.3
1989	108.23	108.5[r]	104.5[r]	106.6	118.8	124.0
1990	112.67	113.2[r]	109.0[r]	110.8	122.9	130.7
1991	116.80[r]	117.8[r]	111.4[r]	114.5	126.7	136.2
1992	120.10[r]	120.9[r]	114.0	119.1	129.1	140.3
1993[E]	123.00	123.8	NA	NA	NA	NA
1994[E]	126.00	126.7	NA	NA	NA	NA

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: CY = Calendar Year.
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 1972–1992

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[r]	117.0	113.6	94.4	94.6
1992	117.4	125.2	122.7	118.0	93.6	83.7

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

a The Commerce Department 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.

r Revised.

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.

Aircraft Production

For the first time in a decade, sales of aircraft engines and parts (in current dollar terms) fell below the level of the previous year in 1992. The drop was due to continuing decline in U.S. government (largely military) aircraft sales, which suffered a large reduction that could not be offset by the moderate gain in non-U.S. government (largely commercial) aircraft sales.

Current dollar value sales figures, however, told an incomplete story. Actually, the gain in non-U.S. government sales proved to be a slight reduction when adjusted for inflation, and the overall sales figure, converted to constant dollars, was more than three percent below the 1991 level.

The real-term dip in non-military sales was a harbinger of things to come, a reflection of airline carriers' financial difficulties and actions in 1991/92 that resulted in deferments or cancellations of transport aircraft orders already on the books. The greatest impact of these cuts will be felt in the middle years of the decade, so the industry faces a situation where it must expect depressed sales of both its main product lines — military and civil aircraft — for a period that analysts predict will last until 1996, when a resumption of jetliner orders is anticipated.

Total sales of aircraft engines and parts in 1992 came to $67.9 billion, down from $68.5 billion in 1991, according to Bureau of the Census data. Sales to the U.S. government amounted to $20.3 billion, down from $21.7 billion; non-U.S. government aircraft sector sales increased to $47.6 billion from the previous year's $46.8 billion.

The industry delivered 2,570 aircraft, down from 3,100 in 1991. The 1992 figure was compounded of 1,790 civil aircraft and 780 military aircraft. The latter figure, which includes military aircraft exported to foreign nations, was 139 units below the previous year's. The civil aircraft number compares with 2,181 produced in 1991.

Orders for new aircraft engines and parts fell dramatically in 1992, from 1991's $67.5 billion to $49.8 billion, a drop of more than 26 percent. The major portion of the drop was in non-U.S. government orders, which declined by

1993-94

more than $11 billion from $44.8 billion in 1991 to $33.7 billion. U.S. government orders declined from $22.7 billion in 1991 to $16 billion in 1992.

The backlog of aircraft, engines and parts orders at year-end 1992 fell more than $20 billion below the previous year's level, to $153.1 billion from 1991's $173.7 billion. The 1992 backlog was composed of $126.3 billion in non-U.S. government orders (82 percent of the total) and $26.8 in U.S. government orders. The comparable figures for 1991 were $142.5 billion in non-U.S. government orders (82 percent) and $31.2 billion in U.S. government orders.

A breakdown of civil aircraft production shows that commercial transport aircraft accounted for $28.8 billion or more than 93 percent of the $30.7 billion total shipments of complete civil aircraft. The industry delivered 567 transports, 22 fewer than in 1991, but the total dollar value was up by almost $2 billion. Of the 567 deliveries, 387 or 68 percent went to foreign customers and 180 to domestic operators.

Sales of civil helicopters, which had declined in the previous year, slumped dramatically in 1992 in terms of units — from 571 in 1991 to 324. In dollar value terms, helicopter shipments amounted to $142 million, a 20-year low that compares with $211 million in 1991.

The general aviation industry produced only 899 aircraft, the lowest in post-World War II history, down from 1,021. Dollar value was $1.8 billion, down from $2 billion.

The industry produced only 780 military aircraft in 1992, the lowest number built in any year since 1935. The total included 401 aircraft delivered to U.S. military agencies and 379 exported under Foreign Military Sales (FMS) programs (122 units), or through direct sales by U.S. manufacturers to foreign governments (257 units). The comparable figures for 1991 were: total production, 919 aircraft; U.S. military agencies, 556; exports, 363 (94 under FMS, 269 by direct sale).

SALES OF AIRCRAFT, ENGINES, AND PARTS

Calendar Years 1978–1992
(Millions of Dollars)

Year	GRAND TOTAL	TOTAL		Complete Aircraft & Parts		Aircraft Engines & Parts	
		U.S. Gov't	Other	U.S. Gov't	Other	U.S. Gov't	Other
CURRENT DOLLARS							
1978	$19,305	$ 8,724	$10,581	$ 6,853	$ 7,873	$1,871	$ 2,708
1979	24,672	8,649	16,023	6,378	12,701	2,271	3,322
1980	29,524	9,427	20,097	6,724	15,901	2,703	4,196
1981	33,574	12,047	21,527	8,197	16,877	3,850	4,650
1982	31,886	15,120	16,766	10,903	12,316	4,217	4,450
1983	35,879	17,074	18,805	12,898	14,419	4,176	4,386
1984	37,285	20,216	17,069	15,136	13,121	5,080	3,948
1985	43,940	21,899	22,041	17,783	16,466	4,116	5,575
1986	47,757	22,755	25,002	18,788	19,177	3,967	5,825
1987	49,062	23,769	25,293	18,131	18,899	5,638	6,394
1988	50,742	21,316	29,426	15,278	20,433	6,038	8,993
1989	53,825	21,371	32,454	15,340	23,056	6,031	9,398
1990	66,289	24,614	41,675	18,970	30,925	5,644	10,750
1991[r]	68,540	21,724	46,816	16,049	36,876	5,675	9,940
1992	67,889	20,314	47,575	15,009	39,010	5,305	8,565
CONSTANT DOLLARS (1987 = 100)[a]							
1978	$33,574	$15,172	$18,402	$11,918	$13,692	$3,254	$ 4,710
1979	38,854	13,620	25,233	10,044	20,002	3,576	5,231
1980	41,819	13,353	28,466	9,524	22,523	3,829	5,943
1981	42,231	15,153	27,078	10,311	21,229	4,843	5,849
1982	36,275	17,201	19,074	12,404	14,011	4,797	5,063
1983	38,914	18,518	20,396	13,989	15,639	4,529	4,757
1984	37,360	20,257	17,103	15,166	13,147	5,090	3,956
1985	44,519	22,187	22,331	18,017	16,683	4,170	5,648
1986	47,853	22,801	25,052	18,826	19,215	3,975	5,837
1987	49,062	23,769	25,293	18,131	18,899	5,638	6,394
1988	49,796	20,919	28,877	14,993	20,052	5,925	8,825
1989	50,730	20,142	30,588	14,458	21,730	5,684	8,858
1990	59,990	22,275	37,715	17,167	27,986	5,108	9,729
1991[r]	59,808	18,956	40,852	14,004	32,178	4,952	8,674
1992	57,827	17,303	40,524	12,784	33,228	4,519	7,296

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

ORDERS AND BACKLOG OF AIRCRAFT, ENGINES, AND PARTS

Calendar Years 1978–1992
(Millions of Current Dollars)

Year	GRAND TOTAL	TOTAL		Complete Aircraft & Parts		Aircraft Engines & Parts	
		U.S. Gov't	Other	U.S. Gov't	Other	U.S. Gov't	Other
NET NEW ORDERS							
1978	$ 28,111	$11,150	$ 16,961	$ 9,055	$ 14,229	$2,095	$ 2,732
1979	39,457	8,762	30,695	8,762	25,084[a]	2,348	5,611[a]
1980	34,678	16,555	18,123	11,606	14,427	4,949	3,696
1981	34,857	16,946	17,911	11,760	12,621	5,186	5,290
1982	34,138	20,547	13,591	15,978	10,540	4,569	3,051
1983	38,599	22,171	16,428	17,402	11,688	4,769	4,740
1984	47,102	25,829	21,273	19,228	18,148	6,601	3,125
1985	49,942	23,751	26,191	20,062	20,153	3,689	6,038
1986	47,957	21,642	26,315	17,361	20,083	4,281	6,232
1987	52,347	17,019	35,328	12,742	26,411	4,277	8,917
1988	82,148	19,611	62,537	12,862	46,393	6,749	16,144
1989	96,591	25,421	71,170	20,172	56,016	5,249	15,154
1990	82,386	15,541	66,845	10,572	54,565	4,969	12,280
1991[r]	67,490	22,674	44,816	18,139	34,746	4,535	10,070
1992	49,765	16,039	33,726	12,799	24,164	3,240	9,562
BACKLOG AS OF DECEMBER 31							
1978	$ 33,869	$14,897	$ 18,972	$11,759	$ 16,508	$3,138	$ 2,464
1979	50,484	17,316	33,168	13,331	27,955	3,985	5,213
1980	57,235	17,435	39,800	12,702	33,258	4,733	6,542
1981	56,314	21,292	35,022	15,626	27,683	5,666	7,339
1982	58,564	26,644	31,920	20,626	25,980	6,018	5,940
1983	60,372	30,688	29,684	24,091	23,377	6,597	6,307
1984	70,189	36,312	33,877	28,183	28,404	8,129	5,473
1985	76,191	38,150	38,041	30,462	32,091	7,688	5,950
1986	76,391	37,041	39,350	29,035	32,997	8,006	6,353
1987	80,015	30,323	49,692	23,645	40,849	6,678	8,843
1988	111,280	28,412	82,868	21,083	66,782	7,329	16,086
1989	159,150	36,320	122,830	29,182	102,814	7,138	20,016
1990	172,940	26,911	146,029	20,382	126,000	6,529	20,029
1991[r]	173,676	31,176	142,500	24,822	124,112	6,354	18,388
1992	153,144	26,845	126,299	22,312	108,556	4,533	17,743

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)" Series MA37D (Annually).
a AIA estimate, based on MQ37D data.
r Revised.

U.S. AIRCRAFT PRODUCTION—CIVIL

Calendar Years 1969–1992

Year	TOTAL	Domestic Shipments			Export Shipments		
		Trans-ports[a]	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	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

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 1969–1992

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	1,052	664	388	99	289
1991[r]	919	556	363	94	269
1992	780	401	379	122	257

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.

NA Not available.

r Revised.

CIVIL AIRCRAFT SHIPMENTS

Calendar Years 1978–1992

Year	TOTAL	Transport Aircraft[a]	Helicopters	General Aviation
NUMBER OF AIRCRAFT SHIPPED				
1978	18,962	241	904	17,817
1979	18,460	376	1,029	17,055
1980	13,634	387	1,366	11,881
1981	10,916	387	1,072	9,457
1982	5,085	232	587	4,266
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
VALUE—Millions of Dollars				
1978	$ 6,458	$ 4,308	$328	$1,822
1979	10,644	8,030	403	2,211
1980	13,058	9,895	656	2,507
1981	13,223	9,706	597	2,920
1982	8,610	6,246	365	1,999
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

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.

CIVIL TRANSPORT AIRCRAFT BACKLOG[a]

As of December 31, 1988–1992

Company and Model	1988	1989	1990	1991	1992
TOTAL AIRCRAFT ON ORDER					
(Domestic and Foreign Orders)	1,373	1,989	2,138	1,829	1,493
Value (Millions of Dollars)	$58,474	$89,069	$112,339	$108,833	$96,724
Boeing—TOTAL	937	1,440	1,563	1,456	1,210
B-737	488	739	754	615	488
B-747	153	165	250	234	214
B-757	205	344	333	333	241
B-767	91	192	192	188	145
B-777	—	—	34	86	122
Lockheed—TOTAL	1	—	—	—	—
L-100	1	—	—	—	—
McDonnell Douglas—TOTAL .	435	549	575	373	283
DC-10	1	—	—	—	—
MD-11	88	126	175	138	97
MD-80	346	423	400	235	186
TOTAL FOREIGN ORDERS ..	840	1,092	1,205	1,073	884
Value (Millions of Dollars)	$39,504	$54,956	$ 71,213	$ 72,733	$66,795
Boeing—TOTAL	547	750	872	844	687
B-737	263	359	412	329	228
B-747	124	141	211	205	192
B-757	91	119	125	144	91
B-767	69	131	124	114	88
B-777	—	—	—	52	88
Lockheed—TOTAL	—	—	—	—	—
L-100	—	—	—	—	—
McDonnell Douglas—TOTAL .	293	342	333	229	197
DC-10	1	—	—	—	—
MD-11	75	96	131	101	76
MD-80	217	246	202	128	121

Source: Aerospace Industries Association, based on company reports.

a Unfilled firm orders for U.S.-manufactured transport aircraft over 33,000 pounds (including the turboprop-powered Lockheed L-100) excluding options, but including new transports contracted for lease from the manufacturer.

SHIPMENTS OF CIVIL TRANSPORT AIRCRAFT[a]

Calendar Years 1988–1992

Company and Model	1988	1989	1990	1991	1992
TOTAL					
Number of Aircraft Shipped	423	398	521	589	567
Value (Millions of Dollars)	$13,690	$15,074	$22,215	$26,856	$28,750
Boeing—TOTAL	289	279	379	420	441
B-737	165	146	174	214	218
B-747	24	45	68	64	61
B-757	48	51	77	80	99
B-767	52	37	60	62	63
Lockheed—TOTAL	5	—	—	—	—
L-100	5	—	—	—	—
McDonnell Douglas—TOTAL	129	119	142	169	126
DC-10	8	1	—	—	—
MD-11	—	—	3	31	42
MD-80/90	121	118	139	138	84

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

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

On Order or in Production as of 1992

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 3						
747-400*	1988	412-509	390	870	8,380	GE CF6-80C2
THREE ENGINES/CREW OF 3						
MD-11*	1989	293-410	288	618	7,980	GE CF6-80C2-DF1, or P&W PW4360
MD-11ER*	1989	277	265	603	8,525	GE CF6-80C2-DF1 or P&W PW4360
TWO ENGINES/CREW OF 2						
737-300	1984	141	70-71	125-139	1,840 -2,950	CFMI CFM56-3-B1 or B2
737-400	1988	159	73-74	139-151	2,250 -2,800	CFMI CFM56-3-B2 or CFM56-3C
737-500	1990	108-132	68	116	2,500	CFMI CFM56-3-B1 or CFM56-3C-1
757	1982	186-200	126	240	4,550	RR RB211-535E or P&W PW2037
767-200ER*	1984	174-290	180	351	5,942	P&W JT9D-7R4 or GE CF6-80A
767-300*	1986	204-290	190	351	4,650	P&W JT9D-7R4 or GE CF6-80A
767-300ER*	1987	204-290	196	400	6,650	P&W PW4000 or GE CF6-80C2
777*	1995	360-390	295	506	4,200	RR Trent-871, GE GE90-B1, or P&W PW4073
MD-80 series:						
MD-81	1980	155	78	140	1,630	P&W JT8D-209 or P&W JT8D-217A
MD-82	1981	155	79	150	2,176	P&W JT8D-217C
MD-83	1985	155	80	160	2,618	P&W JT8D-219
MD-87	1987	130	74	140	2,405	P&W JT8D-217C
MD-88	1987	155	79	150	2,176	P&W JT8D-219C or P&W JT8D-217C
MD-90	1994	172	87	156	2,260	IAE V2500-D5

Source: Aerospace Industries Association, based on company reports and Aviation Week & Space Technology, "Aerospace Forecast & Inventory" (Annually).

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 McDonnell Douglas Corporation manufacturers models: MD-11, MD-80, and MD-90.

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.

* Wide-body aircraft.

SPECIFICATIONS OF U.S. CIVIL HELICOPTERS

In Production as of 1992

Company	Commercial Model	Number of Places	Useful Load (Lbs.)	Range with Useful Load (N.Miles)	External Cargo Payload (Lbs.)
Bell Helicopter Textron	212	15	5,228	231	5,000
	214 Series	20	7,889	457	7,900
	412	15	5,285[r]	402	4,500[r]
Enstrom Helicopter	F-28 Series	3	1,030	228	1,000
	280 Series	3	1,015	260	1,000
McDonnell Douglas Helicopter	500 Series	5	1,559	367	2,000
	520 Series	5	1,806	239	2,306
	530 Series	5	1,536	275	2,000
Robinson Helicopter	R22	2	546	209	—
Schweizer Aircraft	300C	3	950	201	1,050
Sikorsky Aircraft	S-76B	14	5,091	357	3,300

Source: Helicopter Association International, "1993 Helicopter Annual" (Annually).
r Revised.

CIVIL HELICOPTER SHIPMENTS[a]

Calendar Years 1988–1992

Company and Model	1988	1989	1990	1991	1992
CIVIL SHIPMENTS	383	515	603	571	324
Value (Millions of Dollars)	$334	$251	$254	$211	$142
Bell—TOTAL	62	22	16	4	1
212	13	3	1	—	—
214 series	18	2	1	—	1
222	11	—	—	—	—
412	20	17	14	4	—
Enstrom—TOTAL	17	24	27	17	6
F-28 series	7	6	12	8	3
280 series	10	18	15	9	3
McDonnell Douglas—TOTAL	44	73	77	50	51
500 series	39	64	65	42	23
520N series	—	—	—	3	17
530 series	5	9	12	5	11
Robinson—TOTAL	204	310	384	402	212
R22	204	310	384	402	212
Rogerson—TOTAL	—	—	—	2	3
UH12E	—	—	—	2	3
Schweizer—TOTAL	45	69	83	78	39
300C	45	69	83	78	39
Sikorsky—TOTAL	11	17	16	18	12
S-76	11	17	16	18	12

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.

DIRECT EXPORT SHIPMENTS OF MILITARY HELICOPTERS[a]

Calendar Years 1988–1992

Manufacturer and Model	1988	1989	1990	1991	1992
DIRECT MILITARY EXPORT SHIPMENTS	66	46	48	45	51
Value (Millions of Dollars)	$352	$278	$337	$489	$460
Bell AH-1S	24	26	—	—	—
Boeing Vertol CH-47/414/352	1	—	11	9	6
McDonnell Douglas 500MD (TOW)/ 500 Scout	19	—	—	—	—
Robinson R22	—	—	—	—	10
Sikorsky S-70C	13	17	35	36	24
Sikorsky S-80M	—	3	2	—	11
Sikorsky MH-53	9	—	—	—	—

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 1988–1992

	1988	1989	1990	1991	1992
NUMBER OF AIRCRAFT SHIPPED	1,143	1,535	1,144	1,021	899
Single-Engine, Piston	628	1,023	608	564	510
Multi-Engine, Piston	67	87	87	49	41
Turboprop	291	268	281	222	177
Turbojet	157	157	168	186	171
VALUE OF SHIPMENTS[a] (Millions of Dollars)	$1,918	$1,804	$2,008	$1,968	$1,836
Single-Engine, Piston	$ 66	$ 104	$ 68	$ 93[b]	$ 92[b]
Multi-Engine, Piston	12	24	24	(b)	(b)
Turboprop	596	524	644	527	460
Turbojet	1,242	1,149	1,272	1,348	1,284
Number of Aircraft By Selected Manufacturer					
American General	NA	NA	10	82	51
Aviat	NA	NA	NA	71	63
Beech	372	371	433	402	348
Bellanca	NA	7	4	1	3
Cessna	161	183	171	176	140
Christen	NA	75	68	—	—
Classic	NA	NA	8	8	9
Commander	NA	NA	NA	NA	25
Fairchild	29	12	14	10	14
Gates Learjet	23	25	25	25	23
Gulfstream	51	40	34	29	25
Lake	28	23	17	11	9
Maule	55	35	28	66	33
Mooney	142	143	147	88	69
Piper	282	621	178	41	85
Taylorcraft	NA	NA	7	11	2

Source: General Aviation Manufacturers' Association.
a Manufacturers' net billing price.
b "Multi-Engine, Piston" combined with "Single-Engine, Piston."
NA Not available.

MILITARY AIRCRAFT ACCEPTED BY U.S. MILITARY AGENCIES

Number and Flyaway Value
Calendar Years 1978–1992

Year	TOTAL	Bomber/ Patrol/ Command/ Control	Fighter/ Attack	Transport/ Tanker	Trainer	Helicopter	Other
NUMBER							
1978	723	30	478	28	—	166	21
1979	734	17	529	16	—	158	14
1980	819	16	551	15	18	189	30
1981	918	19	649	17	60	158	15
1982	758	26	478	14	60	172	8
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[r]	17[r]	395[r]	23	—	215[r]	—
1992	523	12	288	30	37	156	—
FLYAWAY VALUE—Millions of Dollars							
1978	$ 4,664	$ 689	$3,496	$ 237	$ —	$ 225	$17
1979	5,470	442	4,660	136	—	219	13
1980	6,514	475	5,282	178	32	516	31
1981	8,446	526	6,518	509	32	825	19
1982	8,605	886	6,383	410	42	872	12
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[r]	1,023[r]	8,517[r]	437	—	1,777[r]	—
1992	10,212	508	6,465	1,346	275	1,618	—

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 1991–1992
(Costs in Millions of Dollars)

Type and Model	Number		Flyaway Cost[b]		Weapon System Cost[c]	
	1991[r]	1992	1991[r]	1992	1991[r]	1992
AIR FORCE—TOTAL	209	145	$4,043	$2,788	NA	$3,292
Fighter/Attack—TOTAL	171	77	$3,597	$1,369	$4,907	$1,607
F-15	30	23	1,504	545	2,210	662
F-16	141	54	2,093	824	2,697	945
Transports/Tankers—TOTAL	19	25	349	1,222	NA	1,451
C-17	—	4	—	1,076	—	1,276
C-26	—	14	—	48	—	48
C-27A	4	1	62	16	62	16
C-130H	11	—	232	—	NA	—
MC-130H	4	6	55	82	74	111
Trainer—TOTAL	—	28	—	109	—	126
T-1A	—	28	—	109	—	126
Helicopters—TOTAL	19	15	97	88	122	108
MH-60G	19	15	97	88	122	108

Source: Department of the Air Force.
NOTE: Costs shown are approximate. Calendar year acceptances may derive from procurement quantities funded in more than one fiscal year.
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.
NA Not available.
r Revised.

MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES ARMY[a]

Calendar Years 1991–1992
(Costs in Millions of Dollars)

Type and Model	Number		Flyaway Cost[b]		Weapon System Cost[c]	
	1991	1992	1991	1992	1991	1992
ARMY—TOTAL	137	91	$1,000	$856	NA	$914
Helicopters—TOTAL	137	91	$1,000	$856	NA	$914
UH-60A	72	30	353	178	NA	181
AH-64	65	61	647	678	NA	733

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.
NA Not available.

MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES NAVY[a]

Calendar Years 1991–1992
(Costs in Millions of Dollars)

Type and Model	Number		Flyaway Cost[b]		Weapon System Cost[c]	
	1991	1992	1991[r]	1992	1991[r]	1992
NAVY—TOTAL	210[r]	165	$5,197	$4,029	$6,748	$5,182
Patrol—TOTAL	17	10	$1,023	$ 407	$1,221	$ 536
E-2C	6	8	317	221	380	309
E-6	5	2	465	186	569	227
EA-6B	6	—	241	—	272	—
Fighter/Attack—TOTAL	130	99	3,406	2,733	4,532	3,405
F-14A	16	16	768	716	1,116	955
F/A-18	80	64	1,978	1,687	2,316	1,966
AV-8B	22	17	382	284	556	393
A-6E	12	2	278	46	544	91
Transports/Tankers—TOTAL	4	5	88	124	98	145
C-130T	2	5	41	124	48	145
KC-130	2	—	47	—	50	—
Trainer—TOTAL	—	9	—	166	—	302
T-45A	—	9	—	166	—	302
Helicopters—TOTAL	59[r]	42	680	599	897	794
AH-1W	22	11	180	111	180	111
CH/MH-53E	6	8	128	173	152	204
HH-60H	7[r]	—	73	—	82	—
SH-60B	6	6	71	94	140	193
SH-60F	18	17	228	221	343	286

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 includes flyaway cost, initial spares, ground equipment, training equipment, and other support items.
r Revised.

MILITARY AIRCRAFT ACCEPTANCES FOR REIMBURSABLE PROGRAMS[a]

Calendar Years 1991–1992
(Millions of Dollars)

Accepting Agency, Type, and Model	Number of Aircraft Accepted		Flyaway Cost[b]	
	1991	1992	1991	1992
TOTAL ACCEPTANCES FOR REIMBURSABLE PROGRAMS	94[r]	122	$1,462[r]	$2,539
AIR FORCE—TOTAL	87	93	$1,329	$1,863
Fighter Attack—TOTAL	87	93	1,329	1,863
F-15	7	10	258	278
F-16 C/D	80	83	1,071	1,585
NAVY—TOTAL	7[r]	21	$ 185[r]	$ 601
Patrol—TOTAL	—	2	—	101
E-2	—	2	—	101
Fighter/Attack—TOTAL	7[r]	19	185[r]	500
F/A-18	7[r]	19	185[r]	500
ARMY—TOTAL	—	8	$ —	$ 75
Helicopters—TOTAL	—	8	—	75
UH-60	—	8	—	75

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.
r Revised.

MILITARY AIRCRAFT PROGRAM PROCUREMENT[a]

Fiscal Years 1992, 1993, and 1994
(Millions of Dollars)

Agency and Model	1992		1993[E]		1994[E]	
	No.	Cost	No.	Cost	No.	Cost
AIR FORCE						
AC-130U Spectre Gunship	1	$ 77.9	—	$ —	—	$ 27.8
B-2 Stealth Bomber	1	2,298.2	4	2,660.1	—	604.3
C-17 Globemaster III	4	1,696.3	6	2,041.2	6	2,318.3
C-130H Hercules	9	381.4	9	396.4	—	53.8
Civil Air Patrol Aircraft	27	1.9	27	2.6	27	2.6
E-8A JSTARS	—	125.4	2	585.1	1	405.5
EFS	38	14.0	42	12.1	33	9.9
F-15E Eagle	3	694.6	—	11.3	—	28.6
F-16 Falcon	48	1,150.8	24	676.5	24	795.5
KC-135 Re-engining	26	534.1	14	326.3	—	—
MC-130H Combat Talon II	—	113.0	—	53.5	—	24.0
MH-60G Pave Hawk	6	23.5	10	29.8	—	—
T-1A Jayhawk	36	156.1	36	157.0	35	147.4
ARMY						
AH-64 Apache	—	$ 204.0	—	$ 146.6	—	$ 17.6
CH-47 Modernization	—	282.9	—	14.9	—	15.4
OH-58D AHIP Modification	—	350.4	—	319.6	—	145.5
UH-60L Black Hawk[b]	60	507.4	60	405.0	60	408.3
NAVY						
AH-1W Sea Cobra	20	$ 211.3	12	$ 122.2	12	$ 143.3
AV-8B Harrier	6	270.0	—	24.8	4	144.6
CH/MH-53E Super Stallion	18	494.0	20	494.6	12	296.9
E-2C Hawkeye	6	499.2	—	94.8	—	27.9
EA-6B Prowler	—	115.1	3	482.8	—	77.6
F-14D Tomcat	—	175.5	—	141.1	—	—
F/A-18 Hornet	48	2,036.8	36	1,253.5	36	1,745.3
HH-60H[b]	—	—	7	116.5	9	144.1
SH-60B Seahawk LAMPS MK-111	13	266.7	12	234.5	7	216.4
SH-60F CV ASW	12	242.0	9	172.1	8	186.5
T-45 Goshawk	12	340.7	12	262.6	12	290.0
SPECIAL OPERATIONS						
MH-47E Chinook	13	$ 188.9	—	$ 5.0	—	$ 4.1
MH-60K Black Hawk	5	128.3	6	5.0	—	3.7

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

ACTIVE U.S. MILITARY AIRCRAFT IN CONTINENTAL U.S.[a]

Fiscal Years 1980–1994

Year	Total	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[r]	12,481	9,954	2,222	305	8,529
1989	19,223	11,893[r]	9,501	2,131	261	7,330
1990	20,017[r]	12,817	10,360	2,199	258	7,200[r]
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[E]	17,660	10,524	8,399	1,917	208	7,136
1994[E]	16,947	10,154	8,111	1,874	169	6,793

Source: Office of the Secretary of Defense, as reported in "FAA Aviation Forecasts" (Annually).
a Includes Army, Air Force, Navy, and Marine regular service aircraft, as well as Reserve and National Guard Aircraft.
E Estimate.
r Revised.

DEPARTMENT OF DEFENSE
OUTLAYS FOR AIRCRAFT PROCUREMENT

By Agency
Fiscal Years 1962–1994
(Millions of Dollars)

Year	TOTAL AIRCRAFT PROCUREMENT	Air Force	Navy	Army
1962	$ 6,659	$ 4,387	$ 2,102	$ 170
1963	6,309	3,747	2,328	234
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 E	20,107	10,811	7,506	1,790
1994 E	19,276	10,881	6,716	1,679

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 1992

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							
A-6E Intruder	Grumman	USN/USMC	2	30	2xP&W J52	Mach 0.8 at sea level	Also EA-6A/B & KA-6D
AV-8B Harrier 2	MDC/BAe	USMC	1	13	1xRR F402	Mach 0.91	Graphite/epoxy super-critical wing
BOMBERS							
B-2 Stealth Bomber	Northrop	USAF	2	100-110	4xGE F118	7,600 miles	Radar eluding tactical bomber
FIGHTERS							
F14D	Grumman	USN	2	42	2xGE F110	Mach 2.3 class	Missile, gun fleet defense
F-15E Eagle	MDC	USAF	2	37	2xP&W F100	Mach 2.5 class	Dual role fighter/long range interdiction
F-16 A/B Fighting Falcon	Lockheed	USAF	1-2	16	1xP&W F100	Mach 2+ class	Multirole fighter; fully fly-by-wire; missiles, guns.
F-16 C/D Fighting Falcon	Lockheed	USAF	1-2	18	1xP&W F100/ 1xGE F110	Mach 2+ class	Provisions for AMRAAM, LANTIRN, and new EW Nav. Comm. Systems
F/A-18 Hornet	MDC/Northrop	USN/USMC	1-2	23	2xGE F404	Mach 1.7 class	Missiles, guns; also export
F-22 A/B Superstar	Lockheed/ Boeing	USAF	1-2	30	2xPW F119	Mach 1.7 class	B version is tandem-seat version
COMMAND/CONTROL AND PATROL							
E-2C Hawkeye	Grumman	USN	5	38	2xAll T56	6 hr. mission duration	AEW command & control; passive detection
E-6A Tacamo	Boeing	USN	18	167	4xCFM56	Long endurance	AEW command & control
CARGO-TRANSPORT							
C/HC-130 Hercules	Lockheed	USAF/USN	4	74-78	4xAll T56	363 mph; 2,038 n.m.	92-128 troops or 39-43,000 lbs.
C-17A	MDC	USAF	3	267	4xP&W F117	Mach 0.77; 3,000 n.m.	102 troops or 172,000 lbs.
C-20G	Gulfstream	USN	2	43	2xRR Tay	391 mph; 3,694 n.m.	USN verison of Gulfstream IV
C-26B	Fairchild	USAF/USA	2	9	2xGA TPE 331	285 mph; 2,000 mi.	US version of SA227-DC Metro 23
C-27 Spartan	Chrysler	USAF	2	36	2xGE T64	288 mph; 1,500 n.m.	USAF version of Alenia G-222
C-29A	BAe	USAF	2-3	15	2xGA TFE 731	Mach 0.87; 2,870 n.m.	USAF version of BAe 125
KC-130T	Lockheed	USN/USMC	5-7	80	4xAll T56	Max 10,769 gals.	Tanker
MC-130H Combat Talon II	Lockheed	USAF	5	76	4xAll T56	345 mph; 2,046 n.m.	Support requirements of SOF
TRAINING							
T-45A Goshawk	MDC/BAe	USN	2	9	1xRR F405	Mach 1.04 at 25,000 ft.	Next generation trainer
T-1A Jayhawk	Beech	USAF	3	10	2xP&W JT-15D	Max 538 mph	Tanker/Transport Trainer
HELICOPTERS							
AH-1W Super Cobra	Bell-Textron	USN	2	10	2xGE T700	Max 218 mph; 395 mi.	TOW, hellfire, sidewinder
AH-64 Apache	MDC	Army	2	11	2xGE T700	Max 197 mph; 445 mi.	Attack helicopter
CH/MH-53E	Sikorsky	USN	3-8	33-36	3xGE T64	Max 196 mph; 710 mi.	55 passengers, aux. tanks/ minesweeping
HH-60H	Sikorsky	USN	4-12	14	2xGE T700	Max 135 mph; 500 mi.	Strike and rescue
MH-60G Pave Hawk	Sikorksy	USAF/Army	3	12	2xGE T700	Max 184 mph; 1,380 mi.	11 troops; combat; search; rescue
SH-2G	Kaman	USN	3	8	2xGE T700	Max 159 mph; 500 mi.	LAMPS Mk.1 helicopter
SH-60B Seahawk	Sikorsky	USN	3	15	2xGE T700	Max 171 mph; 640 mi.	ASW
SH-60F	Sikorsky	USN	4	14	2xGE T700	Max 177 mph; 789 mi.	ASW
UH-60 Black Hawk	Sikorsky	Army/USAF	3	11	2xGE T700	Max 184 mph; 373 mi.	UTTAS
V-22 Osprey	Bell/Boeing	USMC	3	32	2xAll T406	Max 316 mph; 1,382 mi.	24 troops, rotors tilt into airplane mode

Source: Aviation Week & Space Technology, "Aerospace Forecast & Inventory" (Annually).
KEY: All = Allison Gas Turbine; BAe = British Aerospace; CFM = CFM International; GA = Garrett Engine; GE = General Electric; Lyc = Textron Lycoming; MDC = McDonnell Douglas; P&W = Pratt & Whitney; PWC = P&W of Canada; RR = Rolls Royce.

Missile Programs

For the first time since 1987, the industry's sales of missile systems and parts went up instead of down in 1992. Similarly, the general decline in the flow of new orders in evidence for several years was interrupted by a significant increase.

The gains, however, do not indicate a reversal of the downward trend in missile production activity. They reflect for the most part certain post-Desert Storm shipments and orders to non-U.S. customers, notably sales of Patriot and Hellfire missiles to Saudi Arabia, Kuwait and Israel (some of these transactions are reflected in sales data, others are included under new orders).

Data compiled by the Bureau of the Census shows 1992 sales of missile systems and parts (excluding propulsion units) at $9.5 billion, up from $9 billion in the previous year. The detailed data indicates that about $400 million of the $500 million gain was in sales to non-U.S. customers.

Census reported new orders for missiles and parts totaling $9.5 billion, which compares with $8.1 billion in 1991. The backlog for missile systems (again excluding propulsion) at year-end 1992 was $12.8 billion, up slightly from $12.6 billion at the end of the previous year.

Sales of missile propulsion systems were reported by Census as part of a grouping that also includes engines and propulsion units for civil and military space vehicles. For 1992, total sales in that grouping amounted to $3.1 billion, down from $3.8 billion in 1991. In the military segment of this category, which includes missile propulsion units, sales declined from $1.9 billion in 1991 to $1.6 billion in 1992.

Net new orders for missile/space propulsion systems amounted to $3.1 billion, a very significant drop from the previous year's $5.7 billion The decline was entirely in the non-military (presumably civil space) segment. New orders in that segment totaled $1 billion, down from 1991's $4.6 billion. New orders in the military segment amounted to $2.1 billion, up from $1.1 billion.

1993-94

The year-end 1992 backlog for missile/space propulsion systems was $9 billion, up from $8.4 billion in 1991. More than 62 percent of the backlog ($5.6 billion) was in non-military orders. The military backlog ($3.4 billion) compares with 1991's $2.3 billion.

The Fiscal Year (FY) 1994 budget plan for the Department of Defense (DoD) contemplated procurement outlays totaling $9.5 billion for missile systems, which compares with a FY 1993 estimate of $12.1 billion. The FY 1994 plan included $5 billion for Air Force procurement (down from $6 billion); $3.2 billion for Navy systems (down from $4.1 billion); and $1.4 billion for Army missiles (down from $2.1 billion).

Missile programs in production or operational service during 1992/93 and planned for funding under FY 1994 appropriations include: Air Force: The AMRAAM (Advanced Medium Range Air-to-Air Missile), $561 million; the AGM-130 air-to-surface weapon, $74 million; and the Advanced Cruise Missile, $59 million.

Navy: The Trident II Fleet Ballistic Missile, $1.1 billion, the largest of all DoD missile programs in terms of procurement authorizations; the Tomahawk cruise missile, $248 million; the Standard air defense missile, $215 million; the Harpoon cruise missile, $98 million; and the RAM (Rolling Airframe Missile), a system for defense against anti-ship missiles, $59 million.

Army: The AAWS-M (Advanced Anti-tank Weapon System - Medium), $207 million; the Laser Hellfire helicopter-launched anti-armor missile, $176 million; the Avenger mobile anti-aircraft weapon system, $154 million; the ATACMS (Army Tactical Missile System), $153 million; the Patriot long-range air defense missile, $41 million; the TOW 2 Army/Marine Corps anti-tank weapon, $25 million, and the MLRS (Multiple Launch Rocket System), $9.8 million.

MISSILE PROGRAM PROCUREMENT[a]

Fiscal Years 1992, 1993, and 1994
(Millions of Dollars)

Agency and Model	1992		1993[E]		1994[E]	
	No.	Cost	No.	Cost	No.	Cost
AIR FORCE						
ACM	57	$ 192.0	—	$ 99.0	—	$ 59.4
AGM-130	120	71.2	102	74.9	130	73.9
AMRAAM[b]	821	723.8	1,040	744.5	793	560.7
HARM[b]	1,214	320.6	846	246.4	—	—
HAVE NAP	32	34.5	—	23.6	—	—
Peacekeeper	—	120.4	—	27.1	—	—
NAVY						
Harpoon	110	$ 167.0	70	$ 89.5	75	$ 98.4
Penguin	42	44.4	—	—	—	—
RAM	—	9.1	—	8.2	240	58.5
Standard	330	256.5	330	254.0	220	215.0
Tomahawk	176	411.2	200	402.0	216	248.3
Trident II	28	1,095.4	21	981.3	24	1,128.6
ARMY						
AAWS-M	—	$ —	—	$ 18.2	1,000	$ 207.3
ATACMS	300	172.4	351	190.6	255	152.6
Avenger[c]	149	196.6	170	175.0	168	154.4
Laser Hellfire[d]	89	11.7	2,781	132.8	3,716	176.4
MLRS	9,306	59.7	24,000	109.8	—	9.8
Patriot	97	163.0	97	24.9	—	40.6
TOW 2[c]	11,718	230.6	8,900	182.0	—	25.3

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

MAJOR MISSILE PROGRAMS
RESEARCH, DEVELOPMENT, PRODUCTION, OPERATION

Program	Agency	Status	Systems Contractor	Propulsion Manufacturer	Guidance Manufacturer
AIR-TO-AIR					
AMRAAM-120A	USAF/USN	D,P	Hughes/Ray	Hercules	Hughes/Ray
Phoenix-54A	USN	O	Hughes/Ray	Hercules	Hughes
Phoenix-54C	USN	P,O	Hughes/Ray	Hercules	Hughes/Ray
Sidewinder-9J	USAF	O	Loral	Hercules/ Aerojet	Loral
Sidewinder-9L	USN/USAF	O	NASC	Bermite/ Hercules	Raytheon/ Loral
Sidewinder-9M	USN/USAF	P	NASC	MTI/Hercules	Ray/Loral
Sidewinder-9N	USAF	O	Loral/Ray	–	Loral
Sidewinder-9P	USAF	P,O	Loral/Ray	Hercules/ Aerojet	Loral
Sidewinder-9R	USN	P	Loral/Ray	MTI/Hercules	Ray/Loral
Sparrow-7F	USN/USAF	O	NASC	Hercules	Ray/Hughes
Sparrow-7M	USN/USAF	P	Ray/Hughes	Hercules	Ray/Hughes
Sparrow-7P	USN	D	NASC	–	Raytheon
Sparrow-7R	USN	D	NASC	–	Ray/Hughes
AIR-TO-SURFACE					
ALCM-86B	USAF	P	Boeing	WI	Honeywell/ Litton
HARM-88A/B	USN/USAF	P	TI	MTI/Hercules	TI
Harpoon-84A/C/D	USN	P,O	MDC	Teledyne CAE	TI/IBM/LSI/ Northrop
GBU-15	USAF	P	RI	Hughes	–
Maverick-65A/B	USAF	P,O	Hughes	MTI/Aerojet	Hughes
Maverick-65D	USAF	P,O	Hughes/Ray	MTI/Aerojet	Hughes/Ray
Maverick-65E	USMC	P	Hughes	MTI/Aerojet	Hughes
Maverick-65F	USN	P	Hughes/Ray	MTI/Aerojet	Hughes/Ray
Maverick-65G	USAF	D	Hughes/Ray	MTI/Aerojet	Hughes/Ray
Shrike-45A/B	USN/USAF	O	NWC/PMTC	Aerojet/ Hercules	Texas Instruments
Sidearm 1-122A	USMC	P	Motorola	MTI/Hercules	Motorola
SLAM-84E	USN	P	MDC	Teledyne CAE	MDC/Hughes/RI
SRAM-69A	USAF	O	Boeing	Lockheed	Kearfott
Standard ARM-78D	USN/USAF	O	Hughes	NOSIH	Hughes
Walleye 1-62	USN	O	MM	–	MM/Hughes
Walleye 1ER-62	USN	R,D	NAC	–	NAC
Walleye 2-62	USN	O	NAC	–	NAC
Walleye 2 (ER/DL)-62	USN	O	NAC	–	NAC

* Also Surface-to-Surface

(Continued on next page)

MAJOR MISSILE PROGRAMS (Continued)

Program	Agency	Status	Systems Contractor	Propulsion Manufacturer	Guidance Manufacturer
AIR-TO-SURFACE (Cont'd.)					
ACM-129	USAF	P	Hughes/MDC	WI	Kearfott
AGM-130A	USAF	D	RI	Hercules	RI
AGM-130B	USAF	D	RI	Hercules	RI
ANTI-SUBMARINE					
VLA-44A	USN	O	Loral	MTI	Kearfott
SURFACE-TO-AIR					
ADATS LOS-F-H	Army	P	MM	–	MM
Chaparral-72A	Army	O	Loral	Hercules/ Bermite	MM/Raytheon
Chaparral-72E/H	Army	P,O	Loral	AR	Loral
Hawk-23B	Army	P,O	Raytheon	Aerojet	Raytheon
Patriot-104	Army	P	Raytheon	MTI	Raytheon
RAM-116A	USN	D	Hughes	Bermite/MTI/ Hercules	Hughes
Redeye-43A	Army/USMC	O	Hughes	AR	Hughes
Roland-115	Army	O	Hughes/ Boeing	Hercules	Hughes/ Boeing
Sea Sparrow-7M	USN	P,O	Ray/Hughes	Aerojet/ Hercules	Ray/Hughes
Standard 1 MR	USN	P,O	Hughes	Aerojet/NOSIH	Hughes
Standard 2 MR	USN	P,O	Hughes	AR/Aerojet/MTI	Hughes
Standard 1 ER	USN	O	Hughes	AR/NOSIH	Hughes
Standard 2 ER	USN	P,O	Hughes/Ray	AR/NOSIH/MTI	Hughes/Ray
Stinger-92A	Army/USMC	P,O	Hughes/Ray	AR	Hughes/Ray
SURFACE-TO-SURFACE					
*Harpoon-84A/C/D	USN	P,O	MDC	Teledyne CAE/ MTI	TI/IBM/LSI/ Northrop
Minuteman 2-30F	USAF	O	AFLC	MTI/Aerojet/ Hercules	Rockwell Autonetics
Minuteman 3-30G	USAF	O	AFLC	MTI/Aerojet	Rockwell Autonetics

* Also Air-to-Surface

(Continued on next page)

MAJOR MISSILE PROGRAMS (Continued)

Program	Agency	Status	Systems Contractor	Propulsion Manufacturer	Guidance Manufacturer
SURFACE-TO-SURFACE (Cont'd.)					
Peacekeeper (MX)-118A	USAF	P,O	BMO	MTI/Avco/RI Aerojet/MM/ Hercules	RI/Northrop/ Honeywell/ Litton
Poseidon C3-73A	USN	O	Lockheed	MTI/Hercules	MM/MIT/Ray/ Hughes
Tomahawk (SLCM)	USN	P	Hughes/MDC	WI/ARC/CSD	MDC/Hughes
Trident 1 (C-4)	USN	P,O	Lockheed	Hercules/MTI	MM/Draper/ Ray/Hughes/ Kearfott
Trident 2 (D-5)	USN	D,P	Lockheed	Hercules/MTI/ UTC	MM/Draper/ Ray/Hughes/ Kearfott/RI
BATTLEFIELD SUPPORT AND ANTIARMOR					
ATACMS	Army	P	Loral	ARC	–
Dragon-47	Army	P,O	MDC	MDC	MDC
Hellfire-114A	Army/USMC	P	RI	Hercules/MTI	MM
HOMS-114K	Army/USMC	D	MM	Hercules/MTI	–
Javelin (AAWS-M)	Army/USMC	D	TI/MM	ARC	–
Lance-52C	Army	O	Loral	RI/Rocketdyne	E-Systems/ Sys-Donner/ Arma
MLRS-26,-270	Army	P,O	Loral	AR	–
Shillelagh-51C	Army	O	Loral	Hercules	Loral
SMAW	USMC	P,O	MDC	MDC	–
TOW-71A	Army	O	Hughes	Hercules	Emerson El.
ITOW-71C	Army	P,O	Hughes	Hercules	Emerson El.
TOW2-71D	Army	P,O	Hughes	Hercules/MTI	Emerson El./TI
TOW2A-71E	Army	P,O	Hughes	Hercules/MTI	Emerson El./TI
TOW2B-71F	Army	P	Hughes	Aerojet/Thorn	Emerson El./TI

Source: Aerospace Industries Association, based on information from "Aviation Week & Space Technology" Magazine.
Status: R-Research; D-Development; P-Production; O-Operational.
NOTE: Status not updated since AW&ST 1992 Forecast issue. However, participants updated to reflect merger and acquisition activity.

Abb:
AFLC – Air Force Logistics Cmd.
AR – Atlantic Research
BMO – Ballistic Missile Office
LSI – Lear Siegler
MM – Martin Marietta
MDC – McDonnell Douglas
MIT – Massachusetts Institute of Technology
MTI – Thiokol
NAC – Naval Avionics Center
NASC – Naval Air Systems Command
NOSIH – Naval Ordnance Station, Indian Head
NWC – Naval Weapons Center
PMTC – Pacific Missile Test Center
Ray – Raytheon
RI – Rockwell International
TI – Texas Instruments
USAF – United States Air Force
USMC – United States Marine Corps
USN – United States Navy
WI – Williams International

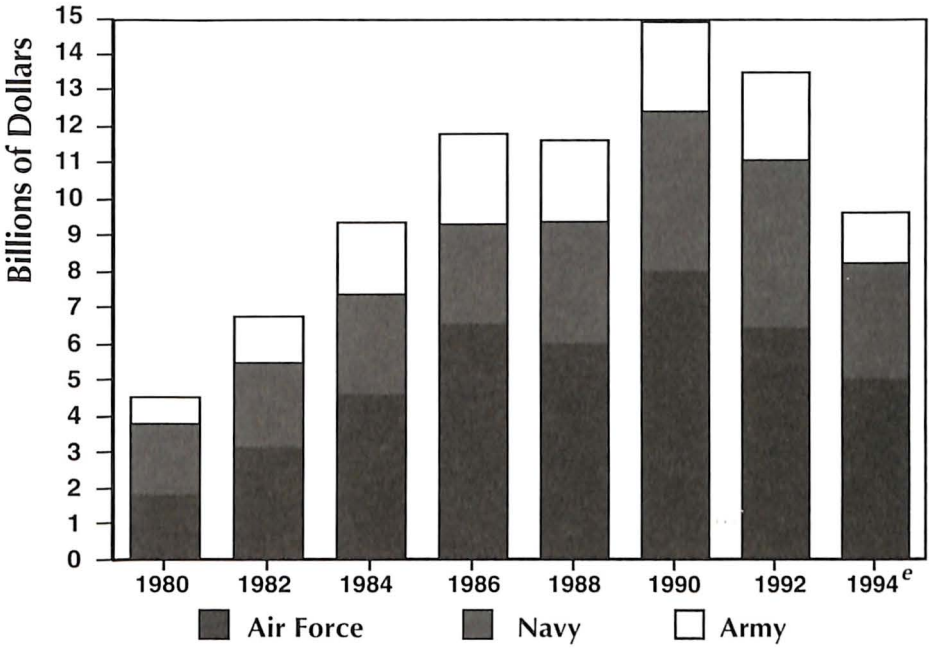
DEPARTMENT OF DEFENSE
OUTLAYS FOR MISSILE PROCUREMENT[a]

By Agency
Fiscal Years 1962–1994
(Millions of Dollars)

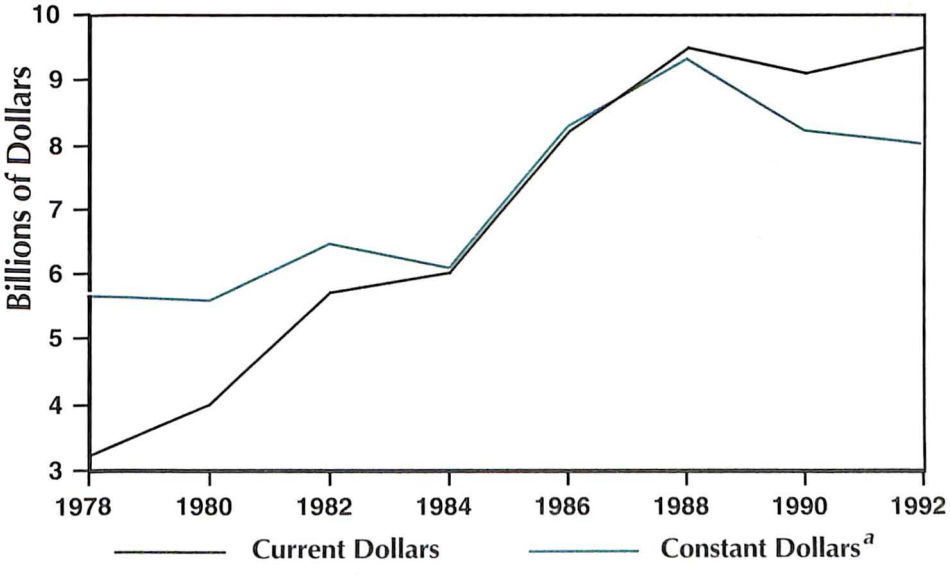
Year	TOTAL MISSILE PROCUREMENT[a]	Air Force	Navy[a]	Army
1962	$ 3,442	$2,385	$ 593	$ 464
1963	3,817	2,676	718	423
1964	3,577	2,100	981	496
1965	2,096	1,320	522	254
1966	2,069	1,313	512	244
1967	1,930	1,278	432	220
1968	2,219	1,388	436	395
1969	2,509	1,382	534	593
1970	2,912	1,467	702	743
1971	3,140	1,497	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	1,376	1,302	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[E]	12,106	5,970	4,064	2,072
1994[E]	9,511	4,990	3,170	1,351

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.

DoD Outlays for Missile Procurement



Sales of Missile Systems and Parts



a *Based on AIA's aerospace composite price deflator (1987 = 100)*
e *Estimate. Latest year reflects Administration's budget proposal*

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

Calendar Years 1975–1992
(Millions of Dollars)

Year	SALES—Current Dollars	SALES—Constant Dollars[b]
1975	$ 3,548	$ 6,694
1976	3,237	6,347
1977	3,118	5,711
1978	3,264[c]	5,677
1979	3,706	5,836
1980	3,971	5,625
1981	4,662	5,864
1982	5,676	6,457
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	9,483	8,078

Year	NET NEW ORDERS	BACKLOG AS OF DECEMBER 31
1975	$ 3,655	$ 4,580
1976	3,036	4,379
1977	3,280	4,541
1978	2,948	4,581
1979	3,724	4,916
1980	4,961	5,558
1981	6,030	6,749
1982	6,034	7,107
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[r]
1992	9,522	12,826

Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)," Series MA37D (Annually).
a Prior to 1980, includes space vehicle systems and parts sold to other than U.S. Government customers.
b Based on AIA's composite price deflator (1987=100).
c AIA estimate based on MQ37D.
r Revised.

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

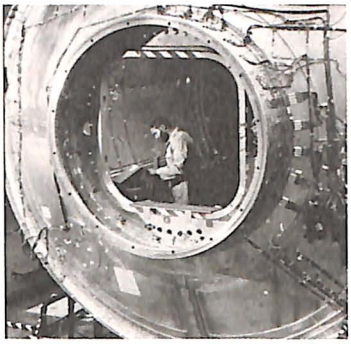
Calendar Years 1978–1992
(Millions of Dollars)

Year	SALES—Current Dollars			SALES—Constant Dollars[c]		
	TOTAL	Military[b]	Non-Military	TOTAL	Military[b]	Non-Military
1978	$ 792	$ 760	$ 32	$1,377	$1,322	$ 56
1979	952	915	37	1,499	1,441	58
1980	939	661	278	1,330	936	394
1981	1,204	786	418	1,514	989	526
1982	1,555	899	656	1,769	1,023	746
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[r]	3,807	1,869	1,938	3,322	1,631	1,691
1992	3,051	1,577	1,474	2,599	1,343	1,256

Year	NET NEW ORDERS			BACKLOG AS OF DECEMBER 31		
	TOTAL	Military[b]	Non-Military	TOTAL	Military[b]	Non-Military
1978	$ 967	$ 919	$ 48	$ 788	$ 754	$ 34
1979	1,187	1,141	46	1,024	980	44
1980	1,221	653	568	1,284	871	413
1981	1,284	746	538	1,343	828	515
1982	2,112	1,134	978	1,901	1,063	838
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[r]	5,661	1,087	4,574	8,422	2,327	6,095
1992	3,124	2,097	1,027	8,992	3,376	5,616

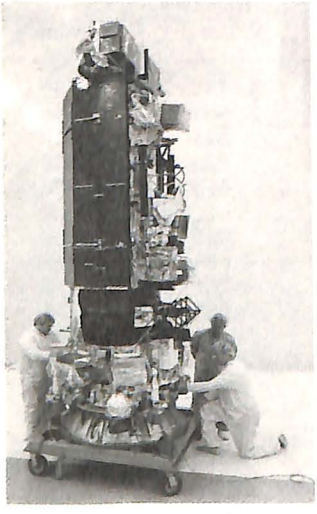
Source: Bureau of the Census, "Aerospace Industry (Orders, Sales, and Backlog)," Series MA37D (Annually).
a See table in Space Programs Chapter for Orders, Sales, and Backlog, Space Vehicle Systems.
b Prior to 1980 includes figures for non-military U.S. Government customers.
c Based on AIA's aerospace composite price deflator (1987=100).
r Revised.

Space Programs



Despite declining defense appropriations and flat civil space budgets, industry sales of space systems continued their steady rise in 1992. According to data compiled by AIA's space-related sales amounted to $29.8 billion, which represents a slight increase in current dollars over the $29.2 billion recorded for the previous year.

The Bureau of the Census, whose figures do not include space vehicle engines and propulsion units, reported space system sales of $10 billion, down from 1991's $10.5 billion. Military space system sales, which had not been as seriously affected by reduced appropriations as other areas of defense procurement, experienced the first current dollar decline in nearly a decade. They fell from $6.8 billion to $5.9 billion, but nonetheless topped non-military sales by a significant margin and accounted for almost 60 percent of the industry's space systems sales. Non-military sales increased by 11 percent to $4.1 billion (up from $3.7 billion).



Combined military/civil net new orders for space systems amounted to $12 billion in 1992, up from $11.2 billion in 1991. The gain was attributable to a big jump in orders for military space systems to $7.2 billion (up from $5.5 billion). Non-military orders dipped to $4.8 billion (down from $5.8 billion).

At year-end 1992, the combined civil/military backlog of orders for space vehicle systems was $13.5 billion, an all-time high that compares with $11.7 billion at the end of 1991. The military backlog was $7.7 billion or 57 percent of the total; the figure compares with $6.2 billion (53 percent) in 1991.

1993-94

The upward trend of government investment in space that had been in evidence for almost two decades was interrupted as federal space outlays dipped for the first time since 1974. Outlays for Fiscal Year (FY) 1992 were estimated at $27.7 billion, down from $28.2 billion in the previous year.

The Department of Defense (DoD) again led all government agencies in space outlays with $14.4 billion, or 52 percent of the total. NASA was second with $12.8 billion in space outlays, down from $13.4 billion. Department of Commerce outlays for FY 1992 were $298 million; the Department of Energy invested $97 million and other agencies combined spent $60 million.

A DoD budget plan for FY 1994 provides information about the major areas of defense-related space activity. The Ballistic Missile Defense program (formerly the Strategic Defense Initiative) continues as DoD's principal space program despite dramatic funding reductions in recent years; for FY 1994, DoD planned funding of $2 billion for research, development, test and evaluation (RDT&E).

Other major space programs include the Air Force-directed Defense Support Program, $459 million for procurement plus $67 million RDT&E; Space Boosters, USAF, $471 million procurement, $331 million RDT&E; the Navstar Global Positioning System, USAF, $174 million procurement, $31 million RDT&E; the Landsat remote sensing system, USAF, $170 million procurement, $35 million RDT&E; and the Fleet Satellite Communications program, Navy, $160 million for procurement.

The NASA plan for FY 1994 sought $14.7 billion in budget outlays, compared with $14.1 billion in FY 1993. A breakdown of the four major budget categories contemplated $7.3 billion for research and development (down from $6.9 billion); $5.2 billion for space flight control and data communications (up from $5 billion); $1.7 billion for research and program management (up from $1.6 billion); and $540 million for facilities construction (up from $517 million). A further breakdown showed projected authorizations for the redesigned space station at $2.3 billion, compared with $2.1 billion in 1991. Projected budget authority for other NASA R&D programs includes $1.6 billion for space science (up $54 million); $1.4 billion for aeronautics and space technology (up from $1.1 billion); and $1 billion for Mission to Planet Earth (down from $73 million).

U.S. SPACECRAFT RECORD[a]

Calendar Years 1957–1992

Year	Earth Orbit[b]		Earth Escape[b]		Year	Earth Orbit[b]		Earth Escape[b]	
	Success	Failure	Success	Failure		Success	Failure	Success	Failure
1957	—	1	—	—	1975	30	4	4	—
1958	5	8	—	4	1976	33	—	1	—
1959	9	9	1	2	1977	27	2	2	—
1960	16	12	1	2	1978	34	2	7	—
1961	35	12	—	2	1979	18	—	—	—
1962	55	12	4	1	1980	16	4	—	—
1963	62	11	—	—	1981	20	1	—	—
1964	69	8	4	—	1982	21	—	—	—
1965	93	7	4	1	1983	31	—	—	—
1966	94	12	7	1[c]	1984	35	3	—	—
1967	78	4	10	—	1985	37	1	—	—
1968	61	15	3	—	1986	11	4	—	—
1969	58	1	8	1	1987	9	1	—	—
1970	36	1	3	—	1988	16	1	—	—
1971	45	2	8	1	1989	24	—	2	—
1972	33	2	8	—	1990	40	—	1	—
1973	23	2	3	—	1991	36[r]	—	—	1[r]
1974	27	2	1	—	1992	33	—	—	1
					TOTAL	1,276	144	82	17

Source: NASA, "Aeronautics and Space Report of the President" (Annually) and TRW Space & Defense Sector, "Space Log" (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.

r Revised.

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

Calendar Years 1957–1992

Country	Total 1957–1992	1988	1989	1990	1991	1992
TOTAL	3,492	116	100	116	89	95
U.S.S.R.	2,369	90	74	75	59	54
United States	969	12	17	27	18	28
Japan	44	2	2	3	2	1
People's Republic of China	33	4	—	5	1	4
European Space Agency	50	7	7	5	8	7
Israel	2	1	—	1	—	—
Other[b]	25	—	—	—	1	1

Source: NASA, "Aeronautics and Space Report of the President" (Annually) and TRW Space & Defense Sector, "Space Log" (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), 5 by India, 1 by Australia, and 1 by the United Kingdom.

U.S. SPACE LAUNCH VEHICLES

As of 1992

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
Scout (1960; 1979)	1. Algol IIIA* 2. Castor IIA* 3. Antares IIIA* 4. Altair IIIA*	431.1 285.2 83.1 25.6	255 205[b]	—	155[b]
Delta 3900 Series (Thor-Delta)[d] (1960; 1982)	1. Thor plus 9 TX 526-2* 2. Delta	912.0 375.0[c] 44.2	3,045 2,180[b]	1,275	2,135[b]
Delta II (1989)	1. Thor plus 9 TX 526-2* 2. Delta	920.8 432.0[c] 43.0	—	1,819	—
Atlas E (1959; 1972)	1. Atlas booster & sustainer	1,722.0	2,090[b,e]	—	1,500[b]
Atlas-Centaur (1972; 1984)	1. Atlas booster & sustainer 2. Centaur	1,913.0 146.0	6,100	2,360	—
Titan IV (1989)	1. Two 7-segment, 3.05-m. dia* 2. LR-87 3. LR-91 4. IUS 1st stage* 5. IUS 2nd stage*	12,402.0 2,452.0 472.0 185.0 76.0	17,690	2,404	—

(Continued on next page)

U.S. SPACE LAUNCH VEHICLES

As of 1992 (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	Sun-Synch. Transfer Orbit
Titan II (1962; 1988)	1. LR-87[2] 2. LR-91	2,108.4 444.8	2,200 1,905[b]	—	—
Titan IIIB-Agena (1966)	1. LR-87 2. LR-91 3. Agena	2,341.0 455.1 71.2	3,600[b]	—	3,060[b]
Titan III(34)D/ IUS (1982)	1. Two 5 1/2-segment, 3.05-m. dia* 2. LR-87 3. LR-91 4. IUS 1st stage* 5. IUS 2nd stage*	11,564.8 2,366.3 449.3 275.8 115.7	14,920	1,850[b]	—
Titan III(34)D/ Transtage (1984)	1. Two 5 1/2-segment, 3.05-m. dia* 2. LR-87 3. LR-91 4. Transtage	11,564.8 2,366.3 449.3 69.8	14,920	1,855[b]	—
Space Shuttle (reusable) (1981)	1. Orbiter; 3 main engines (SSMEs) fire in parallel with SRBs 2. Two solid-fueled rocket boosters (SRBs) mounted on external tank (ET) fire in parallel with SSMEs	1,670[c] 11,790[c]	24,900[f]	—	—

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 Each.
d Maximum performance based on 3920 and 3920 PAM (payload assist module) configurations.
e With dual TE 364-4.
f In full performance configuration (280–420 km orbit).

ORDERS, SALES, AND BACKLOG
SPACE VEHICLE SYSTEMS
(Excluding Engines and Propulsion Units)[a]
Calendar Years 1978–1992
(Millions of Dollars)

Year	SALES—Current Dollars			SALES—Constant Dollars[c]		
	TOTAL	Military[b]	Non-Military	TOTAL	Military[b]	Non-Military
1978	$ 2,324	$1,006	$1,318	$ 4,042	$1,750	$2,292
1979	2,539	1,105	1,434	3,998	1,740	2,258
1980	3,483	1,461	2,022	4,933	2,069	2,864
1981	3,856	1,736	2,120	4,850	2,184	2,667
1982	4,749	2,606	2,143	5,403	2,965	2,438
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[r]	10,515	6,770	3,745	9,175	5,908	3,268
1992	10,029	5,887	4,142	8,543	5,014	3,528

Year	NET NEW ORDERS			BACKLOG AS OF DECEMBER 31		
	TOTAL	Military[b]	Non-Military	TOTAL	Military[b]	Non-Military
1978	$ 3,157	$1,436	$1,721[d]	$ 2,188	$1,693	$ 495
1979	2,698	1,018	1,680	1,448	909	539
1980	3,636	1,625	2,011	2,099	1,218	881
1981	5,062	2,878	2,184	3,163	2,166	997
1982	5,842	2,718	3,124	4,254	2,277	1,977
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[r]	11,222	5,468	5,754	11,664	6,221	5,443
1992	11,963	7,194	4,769	13,483	7,726	5,757

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

a See table in Missile Programs Chapter for Orders, Sales, and Backlog, Engine and Propulsion Units for Missiles and Space Vehicles.

b Space vehicle systems and parts sold to other than U.S. Government customers included as of 1980; previously, this product group combined with missile systems and parts.

c Based on AIA's aerospace composite price deflator (1987 = 100).

d AIA estimate based on MQ37D data.

r Revised.

FEDERAL SPACE ACTIVITIES OUTLAYS

Fiscal Years 1961–1992
(Millions of 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	7,668	4,340	3,162	49	89	28
1981	9,166	4,877	4,131	47	81	30
1982	10,466	5,463	4,772	60	142	30
1983	12,590	6,101	6,247	40	178	25
1984	14,726	6,461	8,000	33	209	22
1985	17,255	6,607	10,441	34	155	17
1986	18,581	6,756	11,449	35	317	25
1987	21,844	7,254	14,264	37	262	26
1988	23,414	8,451	14,397	199	334	33
1989	25,143	10,195	14,504	97	306	41
1990	25,671[r]	12,292	12,962	79	279[r]	60[r]
1991	28,224[r]	13,351	14,432	108	266[r]	67[r]
1992[E]	27,730	12,838	14,437	97	298	60

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 and Agriculture, and the National Science Foundation. NSF funding transferred to NASA after 1982.
E Estimated.
r Revised.
Tr.Qtr. See Glossary.

FEDERAL SPACE ACTIVITIES OUTLAYS IN CONSTANT DOLLARS[a]

Fiscal Years 1961–1992
(Millions of Constant Dollars, 1987 = 100)

Year	TOTAL	NASA[b]	DOD	Energy	Commerce	Other[c]
1961	$ 5,584	$ 2,640	$ 2,701	$243	$ —	$ —
1962	8,910[r]	4,576	3,840	485	4	3
1963	14,973	9,239	5,020	664	45	4
1964	21,454	14,947	5,657	796	45	9
1965	24,358	17,810	5,631	821	85	11
1966	26,551	20,151	5,633	648	97	23
1967	24,076	17,753	5,566	611	128	18
1968	21,369[r]	14,729	6,058	470	93	18
1969	19,293	12,437	6,389	358	95	14
1970	15,774	10,313	5,080	297	69	15
1971	13,756	8,726	4,659	268	82	22
1972	12,482	8,357	3,845	156	98	26
1973	11,734	7,632	3,871	127	73	31
1974	11,218	6,842	4,107	90	148	32
1975	10,279	6,202	3,848	72	134	23
1976	10,375	6,514	3,640	50	139	32
Tr.Qtr.	2,553[r]	1,630[r]	859[r]	15[r]	43	8[r]
1977	10,038	6,500	3,309	40	157	32
1978	10,388	6,014	4,125	48	169	33
1979	10,516	5,783	4,467	84	150	32
1980	10,864	6,149	4,480	69	126	39
1981	11,787	6,272	5,312	60	104	39
1982	12,527	6,539	5,711	71	170	35
1983	14,468	7,011	7,178	46	205	29
1984	16,209	7,112	8,806	37	230	25
1985	18,294	7,005	11,070	36	165	18
1986	19,132	6,956	11,788	36	326	26
1987	21,844	7,254	14,264	37	262	26
1988	22,594	8,154	13,893	192	322	32
1989	23,231	9,420	13,401	90	283	38
1990[r]	22,784	10,910	11,504	70	248	53
1991[r]	24,164	11,431	12,356	92	228	57
1992[E]	23,089	10,689	12,021	81	248	50

Source: AIA, derived from NASA, "Aeronautics and Space Report of the President" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Based on fiscal year GDP implicit price deflator.
b Excludes amounts for air transportation.
c Departments of Interior and Agriculture, and the National Science Foundation. NSF funding transferred to NASA after 1982.
E Estimated.
r Revised.
Tr.Qtr. See Glossary.

FEDERAL SPACE ACTIVITIES BUDGET AUTHORITY

Fiscal Years 1961–1992
(Millions of Current Dollars)

Year	TOTAL	NASA[a]	DOD	Energy	Commerce	Other[b]
1961	$ 1,808	$ 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	6,970	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	5,341	3,547	1,678	103	8	4
1971	4,741	3,101	1,512	95	27	5
1972	4,575	3,071	1,407	55	31	10
1973	4,825	3,093	1,623	54	40	15
1974	4,640	2,759	1,766	42	60	14
1975	4,914	2,915	1,892	30	64	13
1976	5,320	3,225	1,983	23	72	16
Tr.Qtr.	1,341	849	460	5	22	4
1977	5,983	3,440	2,412	22	91	18
1978	6,518	3,623	2,738	34	103	20
1979	7,244	4,030	3,036	59	98	21
1980	8,689	4,680	3,848	40	93	28
1981	9,978	4,992	4,828	41	87	30
1982	12,441	5,528	6,679	61	145	29
1983	15,589	6,328	9,019	39	178	25
1984	17,136	6,648	10,195	34	236	22
1985	20,167	6,925	12,768	34	423	17
1986	21,659	7,165	14,126	35	309	25
1987	26,448	9,809	16,287	48	278	27
1988	26,607	8,302	17,679	241	352	33
1989	28,443	10,098	17,906	97	301	42
1990	28,140[r]	12,142	15,616	79	243[r]	61[r]
1991	27,643[r]	13,036	14,181	108	251[r]	67[r]
1992[E]	28,804	13,199	15,119	97	327	62

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 and Agriculture, and the National Science Foundation. NSF funding transferred to NASA after 1982.
E Estimated.
r Revised.
Tr.Qtr. See Glossary.

FEDERAL SPACE ACTIVITIES BUDGET AUTHORITY IN CONSTANT DOLLARS[a]

Fiscal Years 1961–1992
(Millions of Constant Dollars, 1987 = 100)

Year	TOTAL	NASA[b]	DOD	Energy	Commerce	Other[c]
1961	$ 6,877	$ 3,522	$ 3,096	$259	$ —	$ 4
1962	12,299	6,708	4,845	552	190	4
1963	19,952	13,311	5,690	786	158	7
1964	24,714	18,148	5,785	760	11	11
1965	24,606	18,175	5,568	810	42	11
1966	23,977	17,423	5,810	643	93	10
1967	22,322	16,068	5,536	612	96	10
1968	20,926	14,199	6,160	465	90	13
1969	18,225	11,656	6,139	360	61	9
1970	15,450	10,260	4,854	298	23	12
1971	13,046	8,533	4,161	261	74	14
1972	11,967	8,033	3,680	144	81	26
1973	11,997	7,690	4,035	134	99	37
1974	10,723	6,376	4,081	97	139	32
1975	10,328	6,127	3,976	63	135	27
1976	10,387	6,296	3,872	45	141	31
Tr.Qtr.	2,516[r]	1,593[r]	863[r]	9	41	8[r]
1977	10,804	6,212	4,355	40	164	33
1978	10,942	6,082	4,596	57	173	34
1979	11,189	6,225	4,690	91	151	32
1980	12,311	6,631	5,452	57	132	40
1981	12,832	6,420	6,209	53	112	39
1982	14,890	6,616	7,994	73	174	35
1983	17,914	7,272	10,364	45	205	29
1984	18,862	7,318	11,222	37	260	24
1985	21,381	7,342	13,537	36	448	18
1986	22,301	7,377	14,545	36	318	26
1987	26,448	9,809	16,287	48	278	27
1988	25,675	8,011	17,060	233	340	32
1989	26,280	9,330	16,544	90	278	39
1990[r]	24,976	10,777	13,860	70	216	54
1991[r]	23,667	11,161	12,141	92	215	57
1992[E]	23,983	10,990	12,589	81	272	52

Source: AIA, derived from NASA, "Aeronautics and Space Report of the President" (Annually).
a Based on fiscal year GDP implicit price deflator.
b Excludes amounts for air transportation.
c Departments of Interior and Agriculture, and the National Science Foundation. NSF funding transferred to NASA after 1982.
E Estimated.
r Revised.
Tr.Qtr. See Glossary.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION BUDGET AUTHORITY

Fiscal Years 1963–1994
(Millions of Current Dollars)

Year	TOTAL	Research and Development	Space Flight Control and Data Communications[a]	Construction of Facilities	Research & Program Management
1963	$ 3,673	$2,929	$ —	$744	$ (b)
1964	5,099	3,890	—	713	496
1965	5,250	4,360	—	267	623
1966	5,175	4,502	—	61	602
1967	4,968	4,235	—	85	648
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[E]	14,322	7,080	5,086	525	1,615
1994[E]	15,266	7,712	5,317	545	1,675

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 FY 84; funds formerly included under Research and Development.
b Included in Research and Development for one year.
E Estimate. Latest year reflects Administration's budget proposal.
Tr.Qtr. See Glossary.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION BUDGET AUTHORITY IN CONSTANT DOLLARS[a]

Fiscal Years 1963–1994
(Millions of Constant Dollars, 1987 = 100)

Year	TOTAL	Research and Development	Space Flight Control and Data Communications[b]	Construction of Facilities	Research & Program Management
1963	$13,484	$10,753	$ —	$2,731	$ (c)
1964	18,448	14,074	—	2,580	1,795
1965	18,571	15,423	—	944	2,204
1966	17,802	15,487	—	210	2,071
1967	16,527	14,088	—	283	2,156
1968	14,708	12,538	—	122	2,048
1969	12,184	10,107	—	101	1,976
1970	10,845	8,658	—	153	2,034
1971	9,114	7,034	—	72	2,009
1972	8,653	6,600	—	139	1,915
1973	8,473	6,462	—	196	1,815
1974	7,026	5,070	—	233	1,722
1975	6,791	4,882	—	301	1,608
1976	6,935	5,228	—	160	1,546
Tr.Qtr.	1,749[r]	1,313[r]	–	21[r]	415[r]
1977	6,896	5,157	—	213	1,526
1978	6,822	5,056	—	272	1,494
1979	7,042	5,371	—	229	1,443
1980	7,428	5,792	—	225	1,411
1981	7,101	5,574	—	150	1,377
1982	7,205	5,712	—	136	1,357
1983	7,900	6,365	—	160	1,376
1984	8,053	2,272[b]	4,152	245	1,382
1985	8,029	2,617	3,810	189	1,412
1986	8,039[r]	2,697	3,779	181	1,382
1987	10,923	3,154	6,100	217	1,453
1988	8,745	3,165	3,673	206	1,701
1989	10,135	3,893	4,209	254	1,780
1990	10,938	4,637	4,123	193	1,796
1991[r]	12,000	5,158	4,513	426	1,894
1992	11,921	5,702	4,456	437	1,312
1993[E]	11,644	5,756	4,135	427	1,313
1994[E]	12,116	6,121	4,220	433	1,329

Source: AIA, derived from Office of Management and Budget, "Budget of the United States Government" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Based on fiscal year GDP implicit price deflator.
b Separate budget category beginning in FY 84; funds formerly included under Research and Development.
c Included in Research and Development for one year.
E Estimate. Latest year reflects Administration's budget proposal.
r Revised.
Tr.Qtr. See Glossary.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION OUTLAYS

Fiscal Years 1963–1994
(Millions of Current Dollars)

Year	TOTAL	Research and Development	Space Flight Control and Data Communications[a]	Construction of Facilities	Research & Program Management
1963	$ 2,552	$1,912	$ —	$225	$ 416
1964	4,171	3,317	—	438	416
1965	5,093	3,984	—	531	578
1966	5,933	4,741	—	573	619
1967	5,426	4,487	—	289	650
1968	4,724	3,946	—	126	652
1969	4,251	3,530	—	65	656
1970	3,753	2,992	—	54	707
1971	3,382	2,630	—	44	708
1972	3,422	2,623	—	50	749
1973	3,315	2,541	—	45	729
1974	3,256	2,421	—	75	760
1975	3,266	2,420	—	85	761
1976	3,669	2,749	—	121	799
Tr.Qtr.	952	731	—	26	195
1977	3,945	2,980	—	105	860
1978	3,983	2,989	—	124	870
1979	4,196	3,139	—	133	925
1980	4,852	3,702	—	140	1,010
1981	5,426	4,228	—	147	1,050
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	7,251	2,118	3,707	170	1,322
1986	7,403	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	11,051	3,922	5,030	190	1,908
1990	12,429	5,094	5,117	218	1,991
1991	13,878	5,765	5,590	326	2,185
1992	13,961	6,579	5,118	463	1,788
1993[E]	14,082	6,912	5,031	517	1,606
1994[E]	14,673	7,259	5,187	540	1,670

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 FY 84; funds formerly included under Research and Development.
E Estimate. Latest year reflects Administration's budget proposal.
Tr.Qtr. See Glossary.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION OUTLAYS IN CONSTANT DOLLARS[a]

Fiscal Years 1963–1994
(Millions of Constant Dollars, 1987 = 100)

Year	TOTAL	Research and Development	Space Flight Control and Data Communications[b]	Construction of Facilities	Research & Program Management
1963	$ 9,369	$ 7,019	$ —	$ 826	$1,527
1964	15,090	12,001	—	1,585	1,505
1965	18,016	14,093	—	1,878	2,045
1966	20,409	16,309	—	1,971	2,129
1967	18,051	14,927	—	961	2,162
1968	15,141	12,647	—	404	2,090
1969	12,964	10,765	—	198	2,001
1970	10,856	8,655	—	156	2,045
1971	9,307	7,237	—	121	1,948
1972	8,951	6,861	—	131	1,959
1973	8,242	6,318	—	112	1,813
1974	7,525	5,595	—	173	1,756
1975	6,864	5,086	—	179	1,599
1976	7,163	5,367	—	236	1,560
Tr.Qtr.	1,786[r]	1,371[r]	–	49[r]	366[r]
1977	7,124	5,381	—	190	1,553
1978	6,686	5,018	—	208	1,460
1979	6,481	4,849	—	205	1,429
1980	6,874	5,245	—	198	1,431
1981	6,978	5,437	—	189	1,350
1982	7,223	5,740	—	130	1,352
1983	7,658	6,109	—	124	1,425
1984	7,758	3,073[b]	3,209	120	1,356
1985	7,688	2,246	3,930	180	1,402
1986	7,623	2,693	3,364	195	1,371
1987	7,591	2,436	3,597	149	1,409
1988	8,774	2,814	4,209	160	1,590
1989	10,211	3,624	4,648	176	1,763
1990	11,031	4,521	4,542	193	1,767
1991[r]	11,882	4,936	4,786	279	1,871
1992	11,624	5,478	4,261	386	1,489
1993[E]	11,449	5,620	4,090	420	1,306
1994[E]	11,645	5,761	4,117	429	1,325

Source: AIA, derived from Office of Management and Budget, "Budget of the United States Government" (Annually).
NOTE: Detail may not add to totals because of rounding.
a Based on fiscal year GNP implicit price deflator.
b Separate budget category beginning in FY 84; funds formerly included under Research and Development.
E Estimate. Latest year reflects Administration's budget proposal.
r Revised.
Tr.Qtr. See Glossary.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION BUDGET AUTHORITY FOR RESEARCH AND DEVELOPMENT AND SPACE FLIGHT, CONTROL, & DATA COMMUNICATIONS

Fiscal Years 1993–1994
(Millions of Dollars)

	1993[E]	1994[E]
RESEARCH AND DEVELOPMENT	$7,089	$7,712
Space Station & New Technology Investment	$2,123	$2,300
Space Transport Capability Development	649	649
Space Science—Total	1,578	1,632
Physics and Astronomy	1,104	1,075
Planetary Exploration	474	557
Life & Microgravity Sciences & Applications	141	351
Mission To Planet Earth	1,148	1,075
Commercial Use of Space	164	172
Aeronautics & Space Technology—Total	1,139	1,399
Aeronautical Research & Technology	866	1,021
Space Research & Technology	273	298
Transatmospheric Research & Technology	—	80
Safety, Reliability, & Quality Assurance	33	35
Academic Programs	93	75
Tracking & Data Advanced Systems	23	25
SPACE FLIGHT, CONTROL, AND DATA COMMUNICATIONS	$5,086	$5,317
Space Shuttle Production & Operational Capability Development—Total	$1,053	$1,190
Orbiter	297	297
Launch & Mission Support	178	174
Propulsion Systems	293	298
Advanced Solid Rocket Motor	195	280
Safety & Obsolescence Upgrades	90	140
Space Shuttle Operations—Total	3,016	3,007
Flight Operations	752	768
Flight Hardware	1,398	1,365
Launch & Landing Operations	691	696
Research Operations Support	175	178
Launch Services	181	300
Space and Ground Networks, Communications, & Data Systems	836	821

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[a]
PROCUREMENT (INCLUDING INITIAL SPARES) AND RDT&E
Fiscal Years 1992, 1993, and 1994
(Millions of Dollars)

Agency and Program	1992		1993[E]		1994[E]	
	Procurement	RDT&E	Procurement	RDT&E	Procurement	RDT&E
AIR FORCE						
DMSP	$106.1	$ 28.2	$ 30.9	$ 21.9	$ 29.4	$ 32.0
DSCS	55.5	13.8	25.1	12.9	32.4	25.5
Defense Support Program	64.3	51.5	286.7	49.9	459.1	66.8
LANDSAT	—	—	78.5	5.8	170.3	34.5
Medium Launch Vehicle	221.3	40.4	223.7	49.7	145.4	58.5
Milstar	—	1,042.4	—	1,138.6	—	973.2
Navstar GPS	301.8	51.3	191.5	39.0	174.2	31.1
Space Boosters	287.5	140.7	369.4	120.8	470.6	330.7
NAVY						
FSC	$283.1	$ —	$262.4	$ —	$159.8	$ —
JOINT PROGRAMS						
SDI	$ —	$3,122	$ —	$2,668	$ —	$1,950

Source: Department of Defense, "Program Acquisition Costs by Weapon System" (Annually).
a Total Obligational Authority.
E Estimate. Latest year reflects Administration's budget proposal.
KEY: DMSP = Defense Meteorological Satellite Program
DSCS = Defense Satellite Communications System
FSC = Fleet Satellite Communications
GPS = Global Positioning System
LANDSAT = Land Remote Sensing Satellite System
SDI = Strategic Defense Initiative

STRATEGIC DEFENSE INITIATIVE ORGANIZATION FUNDING BY PROJECT NUMBER

Fiscal Years 1990–1994
(Millions of Dollars)

Project Number and Title		1990	1991	1992	1993[E]	1994[E]
1101	Passive Sensors	$ 57	$ 35	$ 35	$ 22	$ 44
1102	Microwave Radar	—	5	12	10	13
1103	Laser Radar Technology	59	30	14	—	13
1104	Signal Processing	67	45	31	19	32
1105	Discrimination	134	122	86	74	105
1106	Sensor Studies & Experiments	182	159	168	142	168
1110	Sensors/Integration	—	—	21	49	49
1201	Interceptor Component Technology	86	100	36	17	16
1202	Interceptor Integration Technology	95	129	125	185	65
1203	Hypervelocity Technology	20	15	—	—	—
1204	Interceptor Studies & Analysis	13	53	11	8	10
1206	Advanced TMD Weapons	85	31	—	—	—
1208	Discriminating Interceptor	—	—	—	1	50
1209	Endoatmospheric Interceptor Technology	—	—	50	19	65
1212	D-2 Program	—	—	6	10	10
1301	Free Electron Laser	130	29	22	14	—
1302	Chemical Laser Technology	117	91	99	69	43
1303	Neutral Particle Beam Technology	116	105	75	38	20
1304	Nuclear Directed Energy Technology	13	10	—	—	—
1305	Acquisition, Tracking, Pointing & Fire Control Technology	274	80	60	19	20
1307	Directed Energy Demonstration	—	—	—	22	15
1405	Communications Engineering	6	6	10	11	22
1501	Survivability Technology	107	57	66	25	68
1502	Lethality and Target Hardening	39	27	48	10	4
1503	Power & Power Conditioning	84	49	24	45	70
1504	Materials & Structures	36	27	28	24	20
1505	Launch Planning, Development, and Demonstration	32	16	—	—	—
1601	Innovative Science & Technology	113	66	62	83	86
1602,3	New Concepts Development	—	25	37	44	54
1701	Launch Services	—	24	58	30	128
1702	Special Test Activities	—	23	31	32	5
1703	Techsat	—	—	—	—	25
2101	Boost Surveillance and Tracking System	300	—	—	—	—
2102	Brilliant Eyes	78	48	74	241	170
2103	Ground-Based Surveillance & Tracking System	40	47	118	11	—
2104	Ground-Based Radar	89	39	65	91	379
2106	Advanced Contingency Theater Sensor	—	—	32	32	—
2201	Space-Based Interceptor	73	35	—	—	—
2202	Ground-Based Exoatmospheric Interceptor Development	128	85	213	110	571
2203	HEDI (E2I)	66	103	—	—	—
2205	Brilliant Pebbles	129	392	384	246	336
2300	Command Center	88	39	72	52	53

(Continued on next page)

STRATEGIC DEFENSE INITIATIVE ORGANIZATION FUNDING BY PROJECT NUMBER (continued)

Fiscal Years 1990–1994
(Millions of Dollars)

Project Number and Title		1990	1991	1992	1993[E]	1994[E]
3100	Systems Engineering	$ 69	$ —	$ —	$ —	$ —
3102	System Engineering	—	65	90	97	82
3104	Integrated Logistics Support	7	4	4	3	4
3105	Producibility & Manufacturing	10	9	9	9	10
3107	Environment, Siting, & Facilities	4	14	12	6	17
3109	System Security Engineering	—	7	12	12	13
3111	Surveillance Engineering	—	7	9	5	5
3112	System Engineering Support	—	—	27	11	15
3201	Architecture and Analysis	13	7	3	4	5
3202	Operations Interface	7	7	8	8	9
3203	Intelligence Threat Development	12	10	15	15	10
3204	Countermeasures Integration	17	19	17	17	23
3205	Theater Missile Defense Special Studies	14	30	—	—	—
3206	System Threat	—	7	8	9	10
3207	Systems Analysis	—	20	25	12	7
3301	SDIO Test Data Centers	—	—	13	13	12
3302	System Test Environment	125	104	77	91	61
3303	Test & Evaluation Planning	4	4	5	4	7
3304	Targets	47	65	156	132	228
3305	Theater Test Bed	27	38	—	—	—
3306	Computer Resources and Engineering	14	12	29	17	24
3307	Airborne Surveillance Test Bed	56	44	38	38	45
3308	System Simulating (Level 1 and Level 2)	—	5	10	7	5
3309	System Test Planning and Execution	—	—	24	31	111
3310	Test & Facilities and Launch Support	—	—	44	25	—
3311	Mobile Test Assets	—	—	12	18	16
3312	System Test Environment Support	—	—	12	7	8
3313	Test Ranges	—	—	—	21	31
4000	Operational Support Costs	247	228	247	285	382
4305	Miniaturized Accelerators for PET	20	—	1	1	—
	Other programs[a]	28	27	17	16	21
	TOTAL DETAILED PROJECTS	$3,572	$2,878	$3,097	$2,719	$3,890

Source: Strategic Defense Initiative Organization, "1993 Report to the Congress on the Strategic Defense Initiative" (Annually).
NOTE: Excludes Theater Missile Defense Initiative funding beginning in 1992.
a Projects with five year funding under $20 million herein combined.
E Estimate. Represents Administration's budget request.

Air Transportation

The financial problems of the U.S. airlines continued in 1992 as they experienced their heaviest-ever losses and the aggregate operating loss for the three years of 1990s topped $6 billion.

The airlines recorded a solid gain of almost $3 billion in operating revenues but soaring expenses outpaced the revenue increase, with a resultant operating loss of $2.4 billion on revenues totaling $78.1 billion. The figure compares with losses of $1.8 billion in 1991 and $1.9 billion in 1990.

Domestic revenues accounted for roughly three-quarters of total revenues but less than half the loss; domestic operating revenues totaled $57.6 billion, expenses were $58.7 billion and the resultant operating loss was $1.1 billion. In 1991, U.S. carriers lost $528 million on domestic operations, with revenues of $56.2 billion and expenses of $56.8 billion.

In international operations by U.S. airlines, operating revenues for 1992 amounted to $20.5 billion, an all-time record that compares with $18.9 billion in 1991. However, expenses also reached an all-time high ($21.8 billion), causing an operating loss of $1.3 billion.

It was disturbing that the record loss was incurred despite substantial traffic gains in both domestic and international operations (in 1991, much of the loss was attributed to declining traffic). In 1992, scheduled U.S. carriers flew 60.9 billion revenue ton-miles, compared with 56.9 billion in 1991. Passenger traffic amounted to 47.8 billion revenue ton-miles, up from 44.8 billion, and cargo traffic 13.1 billion, up from 12.1 billion. The total revenue load factor was 54.2 percent, up from 53.9 percent.

1993-94

In domestic service, U.S. scheduled airlines boarded 430 million passengers in 1992, an all-time high that compares with 412 million in 1991,

and revenue passenger miles totaled 348 billion, up from 333 billion. The domestic passenger load factor was 62.4 percent, up from 61.2 percent.

International passenger service by U.S. carriers resumed the growth trend interrupted in 1991. Enplanements, at more than 43 million, were up from 1991's 40 million. Revenue passenger miles amounted to 130.6 billion, compared with 115.4 billion in 1991. The international service load factor was 67.1 percent, down from 67.3 percent.

Complete data for global air transportation in 1992 was not available at publication time, but the International Civil Aviation Organization (ICAO) reported partial data showing another heavy aggregate loss for ICAO member airlines. Operating revenues totaled $212 billion, up from $204.5 billion in 1991, but operating expenses were $213 billion (up from $205 billion) and the operating loss amounted to $1 billion. This compares with losses of $500 million in 1991 and $1.5 billion in 1990.

The world airline fleet of turbine-engine aircraft grew by more than 900 units in 1991/92, according to Exxon International's annual survey. As of March 31, 1992, the fleet numbered 16,100 aircraft, up from 15,181 a year earlier. (The Exxon survey excludes aircraft operated by the Russian airline Aeroflot and air taxi operators.) The breakdown for 1992 includes 10,504 turbojets (up from 9,819), 5,420 turboprops (up from 5,174) and 176 turbine-powered helicopters (down from188).

The number of U.S.-built turbine aircraft in world service grew from 9,406 in the 1991 survey to 10,014 in 1992. The U.S.-built percentage of the world fleet increased to 62.2 percent, compared with 62 percent a year earlier (although the increase was slight, it marked the first upturn in several years; the percentage dipped in every year from 1991 back to 1986, when 66.2 percent of the world's airline transports were of American manufacture).

OPERATING REVENUES AND EXPENSES OF WORLD SCHEDULED AIRLINES[a]

Calendar Years 1989–1992
(Millions of U.S. Dollars)

	1989[r]	1990	1991	1992[p]
OPERATING REVENUES:				
Scheduled Services:				
Passenger	$137,030	$153,290	$156,500	
Freight	18,510	18,510	19,510	
Mail	2,030	2,250	2,300	NA
Total Scheduled Services	$157,570	$174,050	$178,310	
Non-Scheduled Services	6,140	7,020	8,310	
Incidental	14,090	17,630	17,880	
Total Operating Revenues	$177,800	$198,700	$204,500	$212,000
OPERATING EXPENSES:				
Flight Operations	$ 44,020	$ 56,060	$56,080	
Maintenance & Overhaul	19,600	22,790	22,970	
Depreciation & Amortization	12,600	14,030	14,080	
User Charges & Station Expenses	29,270	32,200	34,370	NA
Passenger Services	17,590	20,880	21,360	
Ticketing, Sales & Promotion	29,360	32,960	34,280	
General, Administrative & Other	17,760	21,280	21,860	
Total Operating Expenses	$170,200	$200,200	$205,000	$213,000
OPERATING RESULT	$ 7,600	$ (1,500)	$ (500)	$ (1,000)
Percent of Revenue	4.3%	–0.8 %	–0.2 %	–0.5 %
NET RESULT[b]	$ 3,400	$ (4,300)	$ (3,500)	NA
Percent of Revenue	1.9%	–2.2 %	–1.7 %	NA

Source: International Civil Aviation Organization, "Civil Aviation Statistics of the World" (Annually).
a Excludes domestic operations in the USSR.
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 1970–1992

Year	Passengers Carried	Freight Tons Carried	Passenger-Miles Performed	Seat-Miles Available	Passenger Load Factor	Ton-Miles Performed		
						Freight	Mail	TOTAL (Passengers & Baggage, Freight, Mail)
	(Millions)		(Billions)		(Percent)	(Millions)		
1970	383	6.7	286	522	55%	8,180	2,150	38,810
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	9.0	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	2,180	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	86,900
1980	748	12.2	677	1,071	63	20,120	2,520	89,710
1981	752	12.0	695	1,091	64	21,150	2,600	92,800
1982	766	12.8	710	1,115	64	21,600	2,650	94,830
1983	798	13.5	739	1,151	64	24,050	2,740	100,270
1984	848	14.8	794	1,225[r]	65	27,170	2,950	109,040
1985	899	15.1	849[r]	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	987	1,471	67	33,100	3,220[r]	134,570[r]
1988[r]	1,082	19.0	1,059	1,568	68	36,490	3,310	145,290
1989[r]	1,119	20.0	1,106	1,627	68	39,190	3,470	153,180
1990[r]	1,164	20.2	1,177	1,740	68	40,300	3,650	161,120
1991	1,133	19.4	1,145	1,725	66	40,100	3,490	157,930
1992[p]	1,167	19.1	1,214	1,833	66	42,500	3,550	167,140

Source: International Civil Aviation Organization (ICAO).

a Includes international and domestic traffic on scheduled service performed by the airlines of the 174 states which were members of ICAO in 1992.

p Preliminary.

r Revised.

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

Calendar Years 1964–1992
(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	8,58	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[p]	78,119	80,492	(2,373)	57,629	58,725	(1,096)	20,490	21,767	(1,277)

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.

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

Calendar Years 1978–1992
(Millions of Dollars)

Year	TOTAL Operating Revenues	Passenger Service[b]	Mail[c]	Freight[b] & Air Express	Excess Baggage	Other[c]
DOMESTIC OPERATIONS						
1978	$18,189	$15,753	$336	$1,347	$23	$ 730
1979	21,652	18,931	417	1,485	28	791
1980	26,404	23,317	446	1,582	32	1,027
1981	28,788	25,504	497	1,659	36	1,091
1982	28,728	25,440	524	1,505	42	1,218
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[p]	57,629	45,228	931	4,649	87	6,734
INTERNATIONAL OPERATIONS						
1978	$ 4,703	$ 3,534	$117	$ 750	$20	$ 282
1979	5,575	4,271	131	837	23	313
1980	6,543	4,984	175	1,011	25	348
1981	6,390	4,916	165	984	25	299
1982	6,435	4,959	177	990	25	283
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[p]	20,490	15,664	244	2,988	47	1,548

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 Subsidy included with Mail through 1979, and thereafter included in Other, which also includes revenues not related to transport, plus, beginning in 1981, transport revenues not specifically broken out by category by some small carriers.
p Preliminary.

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

Calendar Years 1978–1992
(Millions of Dollars)

Year	TOTAL Operating Expenses	Flying Operations	Maintenance	Passenger Service	Aircraft & Traffic Servicing	Promotion and Sales	Depreciation & Amortization	Other[b]
DOMESTIC OPERATIONS								
1978	$17,172	$ 5,669	$2,155	$1,711	$3,120	$2,040	$1,231	$1,246
1979	21,523	7,998	2,457	2,091	3,702	2,564	1,373	1,337
1980	26,409	11,029	2,758	2,329	4,051	3,096	1,560	1,586
1981	29,051	12,037	2,822	2,522	4,497	3,708	1,723	1,742
1982	29,478	11,529	2,709	2,668	4,665	4,160	1,876	1,869
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[p]	58,725	17,154	6,866	5,340	9,781	8,930	3,339	7,315
INTERNATIONAL OPERATIONS								
1978	$ 4,355	$ 1,351	$ 498	$ 427	$ 768	$ 623	$ 323	$ 363
1979	5,505	1,960	571	538	922	774	352	388
1980	6,766	2,775	616	600	1,049	917	385	423
1981	6,574	2,757	540	583	932	945	382	435
1982	6,452	2,596	512	577	893	954	396	525
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[p]	21,767	5,838	2,144	2,205	3,249	5,227	1,033	2,071

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.

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

Calendar Years 1969–1992
(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[p]	75,424	48,568	15,219	24,445	39,342	52.2

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

TRAFFIC STATISTICS
U.S. AIR CARRIER SCHEDULED SERVICE[a]
Calendar Years 1964–1992

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[r]	44,795	12,130	56,925	105,599	53.9	4,416	651	169
1992	47,808	13,054	60,862	112,369	54.2	4,619	673	170

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 1978–1992

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					
1978	253,957	719	182,669	299,542	61.0
1979	292,700	714	208,891	332,796	62.8
1980	272,829	736	200,829	346,028	58.0
1981	265,304	749	198,715	346,172	57.4
1982	274,342	766	210,149	359,528	58.5
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[r]	806	332,566[r]	543,638[r]	61.2
1992	429,900	808	347,503	557,103	62.4
INTERNATIONAL OPERATIONS					
1978	20,759	2,125	44,112	69,209	63.7
1979	24,163	2,199	53,132	83,330	63.8
1980	24,074	2,258	54,363	86,507	62.8
1981	20,672	2,427	50,173	78,725	63.7
1982	19,760	2,505	49,495	80,591	61.4
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	43,405	3,008	130,578	194,712	67.1

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.

PERCENT OF CIVIL TURBOJET ENGINE MARKET BY MANUFACTURER AND AIRCRAFT MODEL

as of December 1992

Aircraft Manufacturer and Model	Total Installed Engines	Engine Manufacturers					
		P&W	GE	RR	CFM	IAE	Other
TOTAL ENGINES	33,419	15,710	3,560	2,929	3,388	184	7,648
PERCENT SHARE	100.0%	47.0%	10.7%	8.8%	10.1%	0.6%	22.9%
Airbus A300[a]	488	29%	71%	– %	– %	– %	– %
Airbus A300B4-200	252	12	88	–	–	–	–
Airbus A310[a]	170	38	62	–	–	–	–
Airbus A310-300	256	34	66	–	–	–	–
Airbus A320[a]	36	–	–	–	100	–	–
Airbus A320-200	662	–	–	–	72	28	–
Antonov AN-72	12	–	–	–	–	–	100
Antonov AN-74	4	–	–	–	–	–	100
Antonov AN-124	136	–	–	–	–	–	100
AS Corvette	8	100	–	–	–	–	–
AS Caravelle	76	74	–	26	–	–	–
AS/BAe Concorde	56	–	–	100	–	–	–
BAe 1-11	320	–	–	100	–	–	–
BAe 146	668	–	–	–	–	–	100
BAe HS Trident	27	–	–	100	–	–	–
BAe HS 125	40	–	–	40	–	–	60
Beech 400 Beechjet	4	100	–	–	–	–	–
Boeing B-707[a]	164	93	–	7	–	–	–
Boeing B-707-320C	592	100	–	–	–	–	–
Boeing B-720	36	100	–	–	–	–	–
Boeing B-727 series[a]	636	99	–	1	–	–	–
Boeing B-727[b]	411	100	–	–	–	–	–
Boeing B-727C	348	100	–	–	–	–	–
Boeing B-727-200[b]	807	100	–	–	–	–	–
Boeing B-727-200 ADV	2,517	100	–	–	–	–	–
Boeing B-737[a]	236	99	–	–	1	–	–
Boeing B-737-200	376	100	–	–	–	–	–
Boeing B-737-200 ADV	1,432	100	–	–	–	–	–
Boeing B-737-300	1,498	–	–	–	100	–	–
Boeing B-737-400	546	–	–	–	100	–	–
Boeing B-737-500	424	–	–	–	100	–	–
Boeing B-747[a]	920	58	29	13	–	–	–
Boeing B-747-100	636	95	–	5	–	–	–
Boeing B-747-200B	1,120	61	27	12	–	–	–
Boeing B-747-400	892	29	44	27	–	–	–
Boeing B-757[a]	92	67	–	33	–	–	–
Boeing B-757-200	912	48	–	52	–	–	–
Boeing B-767[a]	314	30	70	–	–	–	–
Boeing B-767-200ER	240	50	50	–	–	–	–
Boeing B-767-300ER	376	42	49	9	–	–	–
Canadair CL 600/601	4	–	50	–	–	–	50
Canadair Regional Jet	4	–	100	–	–	–	–
Cessna 500s	86	100	–	–	–	–	–
Cessna 650	10	–	–	–	–	–	100
Convair CV 880/990	8	–	100	–	–	–	–

(Continued on next page)

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

as of December 1992

Aircraft Manufacturer and Model	Total Installed Engines	Engine Manufacturers					
		P&W	GE	RR	CFM	IAE	Other
Dassault Falcon	111	– %	83%	– %	– %	– %	17%
Dassault Mercure 100	16	100	–	–	–	–	–
Fokker F-28[a]	176	–	–	100	–	–	–
Fokker F-28-4000	216	–	–	100	–	–	–
Fokker 100	294	–	–	100	–	–	–
Learjet 23/24/25	42	–	100	–	–	–	–
Learjet 35	38	5	–	–	–	–	95
Learjet 36/55	6	–	–	–	–	–	100
Gulfstream II/III	24	–	–	100	–	–	–
IAI 1100s	26	–	–	–	–	–	100
Ilyushin IL-62[a]	324	–	–	–	–	–	100
Ilyushin IL-62M	576	–	–	–	–	–	100
Ilyushin IL-76[a]	860	–	–	–	–	–	100
Ilyushin IL-76MD	436	–	–	–	–	–	100
Ilyushin IL-86	324	–	–	–	–	–	100
Ilyushin IL-96-300	8	–	–	–	–	–	100
Lockheed JetStar	28	86	–	–	–	–	14
Lockheed L-1011	684	–	–	100	–	–	–
Douglas DC-8	1,180	66	–	–	34	–	–
Douglas DC-9[a]	604	100	–	–	–	–	–
Douglas DC-9-30	1,020	100	–	–	–	–	–
Douglas DC-10[a]	312	39	61	–	–	–	–
Douglas DC-10-10	342	–	100	–	–	–	–
Douglas DC-10-30	444	–	100	–	–	–	–
MDC MD-11	219	47	53	–	–	–	–
MDC MD-80s[a]	150	100	–	–	–	–	–
MDC MD-81	234	100	–	–	–	–	–
MDC MD-82	1,056	100	–	–	–	–	–
MDC MD-83	356	100	–	–	–	–	–
MDC MD-88	282	100	–	–	–	–	–
Rockwell Sabre	6	100	–	–	–	–	–
Tupolev TU-134[a]	178	–	–	–	–	–	100
Tupolev TU-134A	896	–	–	–	–	–	100
Tupolev TU-154[a]	510	–	–	–	–	–	100
Tupolev TU-154B	330	–	–	–	–	–	100
Tupolev TU-154B2	933	–	–	–	–	–	100
Tupolev TU-154M	468	–	–	–	–	–	100
Yakolev YAK-40 series[a]	9	–	–	–	–	–	100
Yakolev YAK-40[b]	597	–	–	–	–	–	100
Yakolev YAK-42	252	–	–	–	–	–	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; MDC = McDonnell Douglas; P&W = Pratt & Whitney; RR = Rolls-Royce.

TURBINE-ENGINED AIRCRAFT IN THE WORLD AIRLINE FLEET

(By Model, 1988–1992)

	1988	1989	1990	1991	1992
TOTAL AIRCRAFT IN SERVICE	12,575	13,514	14,651	15,181	16,100
Turbojets—TOTAL	8,085	8,587	9,426	9,819	10,504
Aerospatiale SE-210 Caravelle	59	56	49	38	34
Aerospatiale SN-601 Corvette	12	12	7	2	—
Airbus A300	272	294	327	331	346
Airbus A310	116	147	180	193	207
Airbus A320	2	23	130	247	354
Antonov 124	—	—	—	7	7
B.Ae./Aerospatiale Concorde	14	14	14	14	14
B.Ae. 146/RJ-70	82	102	144	166	173
B.Ae. One-Eleven	167	164	132	146	143
B.Ae. Trident	27	27	25	32	9
B.Ae. (HS) 125	16	17	16	17	19
Beech 400 Beechjet	—	—	—	1	3
Boeing 707/720	245	224	210	198	176
Boeing 727	1,686	1,684	1,648	1,515	1,457
Boeing 737	1,426	1,585	1,836	2,019	2,189
Boeing 747	653	676	775	806	865
Boeing 757	167	215	324	380	497
Boeing 767	207	254	345	399	462
Canadair CL-601 Challenger	1	—	—	2	2
Canadair Regional Jet	—	—	—	—	2
Cessna 500/550/650 Citation I/II/III	37	48	43	44	35
Convair 880/990	2	2	—	—	1
Dassault Falcon 10/20/50	39	44	39	43	41
Dassault Mercure	11	11	11	11	8
Fokker F-28 Fellowship	203	203	199	197	191
Fokker 100	1	14	58	93	150
Gates Learjet	56	56	37	34	37
Gulfstream II/III G-1159	14	14	15	16	17
Ilyushin IL-62	66	67	56	39	33
Ilyushin IL-76	55	58	60	61	64
Israel Aircraft 1121/1124	7	3	2	2	3
Lockheed L-1011 Tristar	229	229	228	227	214
Lockheed L-1329 Jetstar	13	13	6	5	4
MBB Hansa HFB-320	1	5	—	—	—
McDonnell Douglas DC-8	282	276	253	257	261
McDonnell Douglas DC-9	853	842	847	741	741
McDonnell Douglas DC-10	361	370	365	361	361
McDonnell Douglas MD-11	—	—	3	36	73
McDonnell Douglas MD-80	462	588	799	908	1,032
Mitsubishi MU-300 Diamond	1	2	—	—	—
Rockwell/Sabreliner 60	—	3	3	3	2
Tupolev Tu-134	101	97	74	54	82
Tupolev Tu-154	87	95	111	156	131
Yakolev Yak-40/42	52	53	55	48	64

(Continued on next page)

TURBINE-ENGINED AIRCRAFT IN THE WORLD AIRLINE FLEET

(By Model, 1988–1992, continued)

	1988	1989	1990	1991	1992
Turbine-Powered Helicopters—TOTAL	271	240	176	188	176
Aerospatiale SA-315 Lama	3	—	—	—	—
Aerospatiale SA-316 Alouette III	9	8	4	4	—
Aerospatiale SA-318 Alouette II	4	4	3	3	2
Aerospatiale SA-319 Alouette III Astazou	4	4	4	4	2
Aerospatiale SA-341 Gazelle	—	—	—	1	1
Aerospatiale (Nurtanio) SA-330 Puma	23	22	16	18	18
Aerospatiale AS-332 Super Puma	5	5	5	5	5
Aerospatiale AS-350 Ecureuil/ AStar	6	7	10	10	7
Aerospatiale AS-355 Ecureuil 2/ Twinstar	2	3	4	4	4
Aerospatiale SA-365 Dauphin II	9	12	10	10	10
Agusta A109	—	—	—	3	3
Bell (Agusta/Fuji) 204	6	5	6	5	3
Bell 205	2	2	2	2	2
Bell 206 Jetranger/Longranger	52	39	26	33	33
Bell 212	29	27	15	15	16
Bell (Fuji) 214/214ST	1	—	—	—	—
Bell 222 UT	4	1	—	—	—
Bell 412	5	2	3	4	6
Boeing-Vertol 234 Chinook	3	—	—	—	—
Hughes (Kawasaki) 500/369D	1	1	1	1	—
MBB/Kawasaki BK 117	1	1	—	—	—
MBB/Nurtanio Bo.105	34	34	33	33	33
Sikorsky S-55T	5	5	5	5	5
Sikorsky S-58T	7	5	5	4	4
Sikorsky S-61	34	32	10	10	10
Sikorsky S-76	19	18	11	11	12
Westland 30	3	3	3	3	—

(Continued on next page)

TURBINE-ENGINED AIRCRAFT IN THE WORLD AIRLINE FLEET

(By Model, 1988–1992, continued)

	1988	1989	1990	1991	1992
Turboprops—TOTAL	4,219	4,687	5,049	5,174	5,420
Aero Spacelines SuperGuppy	4	4	—	—	—
Aerospatiale N.262/Mohawk 298	25	23	16	14	15
Aerospatiale/Aeritalia ATR 42	76	122	178	210	227
Aerospatiale/Aeritalia ATR 72	—	—	17	48	76
Airtech CN-235	2	8	18	24	23
Antonov An-12	14	15	19	20	19
Antonov An-22	—	—	—	—	2
Antonov An-24/26/28/30/32	215	251	246	216	171
B.Ae. ATP	–	12	31	41	46
B.Ae. Vanguard	9	7	5	4	4
B.Ae. Viscount	45	40	33	27	25
B.Ae. (HP-137) Jetstream 31	166	201	277	205	309
B.Ae. Jetstream 41	—	—	—	—	2
B.Ae. (HS) Argosy	5	5	—	—	—
B.Ae. HS-748	154	152	139	130	123
Beech 18 Turbo	21	24	24	20	17
Beech 90 King Air	44	40	26	28	30
Beech 99	171	173	140	122	130
Beech 100 King Air	24	22	23	24	31
Beech 200/300 Super King Air	70	83	78	76	87
Beech 1300	—	5	14	7	2
Beech 1900C/D	73	95	171	191	224
Bristol 175 Britannia	7	7	6	6	5
Canadair CL-44	14	15	13	11	8
CASA/Nurtanio C-212 Aviocar	103	112	104	109	104
Cessna 208 Caravan I	150	229	287	312	307
Cessna F406 Caravan II	–	14	19	21	23
Cessna 425/441 Conquest I/II	9	19	8	4	4
Convair 580/600/640	131	132	108	92	99
DHC-2 Turbo Beaver/Otter	3	3	4	4	4
DHC-5 Buffalo	2	1	1	1	1
DHC-6 Twin Otter	464	465	432	428	437
DHC-7 Dash 7	100	106	94	79	80
DHC-8 Dash 8	82	120	214	254	307
Dornier DO-228	79	90	113	96	112
Douglas DC-3T Turbo Express	1	—	—	1	—
Embraer EMB-110 Bandeirante	231	222	200	174	181
Embraer EMB-120 Brasilia	64	113	201	225	255
Fokker/Fairchild F-27/FH-227 Friendship	434	432	401	389	378
Fokker 50	13	45	101	121	134

(Continued on next page)

TURBINE-ENGINED AIRCRAFT IN THE WORLD AIRLINE FLEET

(By Model, 1988–1992, continued)

	1988	1989	1990	1991	1992
Turboprops (continued)					
GAF Nomad	16	14	9	8	12
Grumman G-21 Turbo Goose	—	—	—	1	1
Grumman G-73 Turbo Mallard	11	10	9	4	5
Grumman G-159 Gulfstream I	32	37	34	33	31
Handley Page Herald	15	17	17	17	16
Harbin Y-12 II	—	—	2	5	26
IAI Arava	3	4	3	1	1
Ilyushin IL-18	69	67	48	42	31
LET L-410	—	—	3	17	19
Lockheed L-188 Electra	79	83	74	67	65
Lockheed L-100/L-382 Hercules	52	58	56	54	56
Mitsubishi MU-2B	11	5	5	8	5
Nihon AMC YS-11	107	102	97	94	92
Pilatus Britten-Norman BN-2T Turbo Islander	3	3	2	3	2
Piper PA-31T/42 Cheyenne	28	35	29	25	19
Piper T-1040	9	15	15	12	13
PZL (Antonov) An-28	—	—	—	—	3
Rockwell Turbo Commander	11	16	14	15	12
Saab SF-340A/B	105	136	206	265	312
Saunders ST-27	9	2	—	—	—
Shorts SC-5 Belfast	5	5	5	5	5
Shorts SC-7 Skyliner/Skyvan	14	15	16	25	24
Shorts 330	76	68	64	51	55
Shorts 360	130	142	150	139	147
Swearingen Merlin	45	46	41	36	36
Swearingen Metro	356	361	249	338	357
Transall C-160	8	8	8	8	8
Xian (Antonov) Y-7	20	31	31	67	65
TOTAL AIRCRAFT IN SERVICE	12,575	13,514	14,651	15,181	16,100
Number Manufactured in U.S.	8,133	8,617	9,307	9,406	10,014
Percent Manufactured in U.S.	64.7%	63.8%	63.5%	62.0%	62.2%
Turbojet Aircraft in Service	8,085	8,587	9,426	9,819	10,504
Number Manufactured in U.S.	6,693	7,029	7,737	7,950	8,427
Percent Manufactured in U.S.	82.8%	81.9%	82.1%	81.0%	80.2%
Turboprop Aircraft in Service	4,219	4,687	5,049	5,174	5,420
Number Manufactured in U.S.	1,332	1,497	1,519	1,406	1,534
Percent Manufactured in U.S.	31.6%	31.9%	30.1%	27.2%	28.3%
Turbine-Powered Helicopters In Service	271	240	176	188	176
Number Manufactured in U.S.	108	91	51	50	53
Percent Manufactured in U.S.	39.9%	37.9%	28.4%	26.6%	30.1%

Source: Exxon International Company, "Air World Survey," compiled by Aviation Data Service, Inc. (Annually).
NOTE: The "Air World Survey" covers the world's airlines with the exception of Aeroflot, the USSR national airline, and covers aircraft in service as of March 31. Excludes air taxi operators.

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

Calendar Years 1977–1992

Year	Gallons Consumed (Millions)	Total Cost (Millions)	Cost Per Gallon (Cents)	Cost Index (1982 = 100)	Cost of Fuel as Percent of Cash Operating Expenses
1977	10,282.0	$ 3,729.8	36.3¢	37.0	20.1%
1978	10,627.1	4,178.2	39.3	40.1	19.7
1979	11,278.1	6,503.0	57.7	58.8	24.4
1980	10,874.0	9,769.5	89.8	91.6	29.7
1981	10,087.8	10,498.0	104.1	106.1	29.3
1982	9,942.1	9,755.2	98.1	100.0	27.2
1983	10,214.4	9,073.1	88.8	90.5	24.5
1984	11,050.4	9,361.7	84.7	86.3	23.8
1985	11,675.1	9,326.7	79.9	81.4	22.2
1986	12,643.0	6,995.8	55.3	56.4	16.3
1987	13,629.5	7,593.8	55.7	56.8	16.0
1988	14,204.8	7,557.2	53.2	54.2	14.4
1989	14,103.9	8,472.7	60.1	61.2	14.9
1990	14,841.1	11,465.2	77.3	78.7	17.6
1991	13,798.4	9,329.5	67.6	68.9	14.8
1992	14,168.0	8,907.9	62.9	64.1	13.5

Source: Air Transport Association of America, "Airline Cost Index" (Quarterly).
a Majors and Nationals excluding Air Florida, Capitol, Transamerica, and World.

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

As of December 31, 1992

State	TOTAL[a]	Public[b]	Paved	Lighted	State	TOTAL[a]	Public[b]	Paved	Lighted
Alabama	208	103	138	98	Nevada	121	61	58	34
Alaska	559	417	61	147	New Hampshire	84	27	48	19
Arizona	271	75	153	72	New Jersey	334	55	145	50
Arkansas	243	99	163	87	New Mexico	170	72	7	48
California	920	264	663	246	New York	520	172	210	135
Colorado	395	83	171	82	North Carolina	344	118	151	113
Connecticut	131	27	81	27	North Dakota	450	98	79	96
Delaware	36	10	14	12	Ohio	716	193	280	187
Dist. of Col.	16	2	15	4	Oklahoma	411	156	215	132
Florida	732	131	312	146	Oregon	387	103	157	76
Georgia	382	114	190	116	Pennsylvania	757	153	311	139
Hawaii	47	13	39	14	Rhode Island	22	8	16	7
Idaho	212	122	77	47	South Carolina	153	68	78	65
Illinois	917	129	279	168	South Dakota	157	76	63	75
Indiana	576	115	165	120	Tennessee	229	90	136	86
Iowa	293	138	162	141	Texas	1,703	406	846	420
Kansas	382	148	136	133	Utah	118	48	81	45
Kentucky	153	66	98	59	Vermont	71	17	17	11
Louisiana	426	88	247	76	Virginia	345	72	155	86
Maine	156	77	49	33	Washington	423	135	204	132
Maryland	187	40	73	49	West Virginia	101	39	62	31
Massachusetts	205	51	116	43	Wisconsin	471	145	176	141
Michigan	435	219	181	177	Wyoming	99	41	50	37
Minnesota	483	161	140	141	**50 States—Total**	17,769	5,504	7,887	4,807
Mississippi	216	86	121	80	Puerto Rico	33	11	28	11
Missouri	473	149	221	143	Virgin Islands	9	2	3	2
Montana	234	126	99	89	S. Pacific[c]	35	28	18	11
Nebraska	295	98	106	92	**TOTAL**	17,846	5,545	7,936	4,831

FACILITIES BY CLASS

Class	Total[a]	Public[b]	Private
Airports	13,016	5,236	7,780
Heliports	4,323	97	4,226
Stolports	74	6	68
Seaplane Bases	433	206	227
Total Facilities	17,846	5,545	12,301

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.

ACTIVE[a] U.S. AIR CARRIER FLEET

By Type of Aircraft, Number of Engines and Model
Active as of December 1988–1992

	1988	1989	1990	1991	1992
TOTAL	5,660	5,778	6,083	6,054	6,913
Turbojets—TOTAL	3,915	3,942	4,148	4,167	4,446
Four-Engine—TOTAL	427	428	432	410	389
Boeing 707	31	27	25	27	20
Boeing 747	171	180	190	184	178
B.Ae. 146	57	53	44	17	23
McDonnell Douglas DC-8	168	168	173	182	168
Three-Engine—TOTAL	1,542	1,459	1,438	1,376	1,381
Boeing 727	1,246	1,167	1,152	1,073	1,029
Lockheed L-1011	112	107	101	100	113
McDonnell Douglas DC-10/MD-11	184	185	185	203	239
Twin-Engine—TOTAL	1,946	2,055	2,278	2,381	2,676
Airbus A-300	57	63	67	63	58
Airbus A-310	19	19	21	42	21
Airbus A-320	—	11	10	35	54
Boeing 737	706	756	812	835	915
Boeing 757	122	146	199	234	328
Boeing 767	126	111	120	136	170
B.Ae. BAC-111	30	—	3	1	—
Cessna C500/C501	—	—	—	—	2
Cessna C550	—	5	7	—	—
Cessna C650	—	—	—	—	1
Dassault Falcon	—	—	—	2	—
Fokker F-28	47	53	68	75	117
Grumman G-1159	—	—	1	3[r]	1
Israel Aircraft 1121	—	—	—	—	1
Learjet LR-25	1	2	1	2	3
Learjet LR-35	1	1	2	—	3
McDonnell Douglas DC-9/MD-80	837	888	967	953	1,002
Turboprops—TOTAL	1,375	1,476	1,595	1,598	1,894
Four-Engine—TOTAL	95	96	88	75	107
Canadair CL44D	6	5	5	—	5
De Havilland DHC-7	39	41	40	33	40
Lockheed 188 Electra	30	30	24	24	44
Lockheed 382/L-100 Hercules	20	20	19	18	18
Twin-Engine—TOTAL	1,280	1,380	1,507	1,523	1,787
Beech BE65	1	—	—	—	16
Beech BE90	1	—	—	—	1
Beech BE99	84	53	54	32	39
Beech BE100	1	1	2	1	4

(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 1988–1992

	1988	1989	1990	1991	1992
Twin-Engine (continued)					
Beech BE200	7	10	16	8	11
Beech BE1900	80	109	147	167	231
B.Ae. ATP	—	—	4	10	10
B.Ae. Jetstream	135	165	222	214	240
CASA C212 Aviocar	18	16	16	13	—
Cessna C425	—	—	—	—	1
Cessna C441	3	4	2	2	2
Convair 580/600/640	72	58	33	37	19
DeHavilland DHC-6	63	69	67	69	74
DeHavilland DHC-8	44	64	74	81	115
Dornier DO228	33	34	32	31	13
Embraer EMB110/EMB120	139	164	204	190	211
Fairchild/Fokker F-27/FH-227	51	53	58	50	53
Fairchild Swearingen SA-226	90	57	22	31	14
Fairchild Swearingen SA-227	191	212	218	200	174
Grumman G-73	7	5	7	4	5
Grumman G-159	5	6	7	2	1
Grumman G-500	1	—	—	—	—
Mitsubishi MU-2	—	—	1	1	10
Nihon YS-11	22	21	21	22	31
Nord ND-262/STC-262	9	2	1	—	1
Piper PA31T	9	12	8	8	99
Piper 42	—	—	—[r]	1	1
Rockwell Aero Commander 690	1	—	—	—	—
Saab-Fairchild SF340A	68	85	109	153	195
Shorts SD-3/SD-330	110	118	103	93	88
Shorts SC-7	—	—	2	2	6
SNAIS ATR-42	35	62	77	101	108
SNAIS ATR-72	—	—	—	—	14
Piston-Engine—TOTAL	362	353	329	283	440
Four-Engine—TOTAL	36	35	31	26	20
Douglas DC-6	35	34	30	25	19
Douglas DC-7	1	1	1	1	1
Three-Engine—TOTAL	3	5	6	5	5
Pilatus Britten-Norman BN2A-MK-3 Turbo Islander	3	5	6	5	5
Twin-Engine—TOTAL	323	313	292	252	415
Helicopters—TOTAL	8	7	11	6	133

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" must have a current U.S. registration and have flown during the calendar year.
r Revised.

ACTIVE U.S. CIVIL AIRCRAFT[a]

As of December 31, 1963–1991
(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	34.4	107.2	59.2	6.5	5.2
1984	225.3	4.370	220.9	35.6	109.9	62.0	7.1	6.3
1985[r]	201.2	4.678	196.5	31.3	98.5	54.9	6.0	5.8
1986[r]	210.2	4.909	205.3	32.0	102.0	58.3	6.5	6.5
1987[r]	208.0	5.253	202.7	30.8	100.4	59.3	5.9	6.3
1988[r]	201.9	5.660	196.2	30.1	98.1	55.6	6.0	6.4
1989[r]	210.8	5.778	205.0	31.9	100.5	58.4	7.0	7.2
1990[r]	204.1	6.083	198.0	30.5	97.6	56.4	6.9	6.6
1991	204.6	6.054	198.5	30.5	98.5	55.7	6.3	7.6

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, and balloons.

r Revised by FAA in 1993 to adjust for non-response bias.

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

As of December 31, 1991

Primary Use[a]	TOTAL	Fixed-Wing			Rotor-craft[b]	Other[c]
		Turbojet	Turboprop	Piston		
TOTAL—ALL AIRCRAFT	204,529	8,520	6,218	175,630	6,298	7,563
Air Carrier—TOTAL	6,054	4,167	1,598	283	6	—
Large	4,695	4,165	455	75	—	—
Small	1,359	2	1,143	208	6	—
General Aviation—TOTAL	198,475	4,353	4,920	175,347	6,292	7,563
Executive	10,033	2,971	2,365	3,912	669	116
Business	31,583	378	646	30,140	366	53
Commuter[d]	738	6	312	374	5	41
Air Taxi[d]	5,501	447	687	3,506	861	—
Instructional	17,901	6	134	16,196	791	774
Personal	115,069	142	224	108,353	746	5,605
Aerial Application	7,006	—	183	5,788	1,035	—
Aerial Observation	5,045	13	21	3,694	1,027	291
Other Work	1,676	19	13	1,025	302	317
Other	3,922	370	335	2,362	489	366

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 single-engine commuters or Air taxis under 12,500 pounds. Otherwise, aircraft included in "Air Carrier."

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

Calendar Years 1987–1991

Primary Use[a]	1987	1988	1989	1990	1991
ACTIVE AIRCRAFT AS OF DECEMBER 31 (in thousands)					
TOTAL	202.7	196.2	205.0	198.0	198.5
Executive	11.1	10.2	11.5	10.1	10.0
Business	37.3	32.6	35.0	33.1	31.6
Commuter[b]	0.9	0.9	1.3	1.2	0.7
Air Taxi[b]	5.8	6.0	6.6	5.8	5.5
Instructional	14.7	15.6	16.6	18.6	17.9
Personal	115.3	114.4	116.4	112.6	115.1
Aerial Application	6.1	6.6	6.6	6.2	7.0
Aerial Observation	4.5	4.4	5.4	4.9	5.1
Other Work	1.5	1.7	2.0	1.4	1.7
Other	5.5	3.8	3.6	4.1	3.9
HOURS FLOWN (in thousands)					
TOTAL	30,883	31,114	32,332	32,096	30,067
Executive	3,143	3,472	3,453	2,913	2,617
Business	5,276	4,594	4,330	4,417	4,154
Commuter[b]	1,255	1,036	1,392	1,333	570
Air Taxi[b]	2,657	2,632	3,020	2,249	2,241
Instructional	4,529	4,917	5,993	7,244	6,141
Personal	9,961	10,015	9,537	9,276	9,685
Aerial Application	1,538	1,842	1,868	1,872	1,911
Aerial Observation	1,304	1,308	1,719	1,745	1,797
Other Work	350	525	517	572	471
Other	871	774	507	475	473

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.

U.S. GENERAL AVIATION
TYPE OF AIRCRAFT AND HOURS FLOWN[r]

Calendar Years 1987–1991

	1987	1988	1989	1990	1991
Number of Active Aircraft by Type (in thousands)					
All Aircraft—TOTAL	202.7	196.2	205.0	198.0	198.5
Fixed Wing:	190.5	183.8	190.8	184.5	184.6
Piston:	181.5	175.0	180.8	175.2	175.3
Single Engine	159.7	153.7	158.9	154.0	154.1
Twin Engine	21.7	21.2	21.8	21.1	21.1
Other	0.1	0.1	0.1	0.1	0.1
Turboprop:	4.9	4.9	5.9	5.3	4.9
Twin Engine	4.7	4.7	5.7	4.9	4.4
Other	0.2	0.2	0.2	0.4	0.5
Turbojet:	4.0	3.9	4.1	4.1	4.4
Twin Engine	3.6	3.6	3.7	3.7	4.1
Other	0.4	0.3	0.4	0.4	0.3
Rotorcraft:	5.9	6.0	7.0	6.9	6.3
Piston	2.6	2.4	3.0	3.2	2.5
Turbine	3.3	3.6	4.0	3.7	3.8
Balloons, Dirigibles, and Gliders	6.3	6.4	7.2	6.6	6.7
Hours Flown by Type of Aircraft (in thousands)					
All Aircraft—TOTAL	30,883	31,114	32,332	32,096	30,067
Fixed Wing: Piston	24,969	24,291	24,907	25,832	24,102
Turboprop	2,010	2,195	2,892	2,319	1,513
Turbojet	1,411	1,554	1,527	1,396	1,236
Rotorcraft: Piston	602	533	692	716	585
Turbine	1,506	1,974	1,918	1,493	2,172
Balloons, Dirigibles, and Gliders	384	568	396	341	459
Average Hours Flown Annually by Type					
All Aircraft—TOTAL	152.4	158.6	157.7	162.1	151.5
Fixed Wing: Piston	137.6	138.8	137.8	147.4	137.5
Turboprop	410.2	448.0	490.2	437.5	308.8
Turbojet	352.8	398.5	372.4	340.5	280.9
Rotorcraft: Piston	231.5	222.1	230.7	223.8	234.0
Turbine	456.4	548.3	479.5	403.5	571.6
Balloons, Dirigibles, and Gliders	61.0	88.8	55.0	51.7	68.5

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 procedures.
r Revised by FAA in 1993 to account for non-response bias.

ACTIVE U.S. AIRMAN CERTIFICATES HELD

As of December 31, 1988–1992

	1988	1989	1990	1991	1992
Pilots—TOTAL	694,016	700,010	702,659	692,095	682,959
Students	136,913	142,544	128,663	120,203	114,597
Private	299,786	293,179	299,111	293,306	288,078
Commercial	143,030	144,540	149,666	148,365	146,385
Airline Transport	96,968	102,087	107,732	112,167	115,855
Helicopter (only)	8,608	8,863	9,567	9,860	9,652
Glider (only)[a]	7,600	7,708	7,833	8,033	8,205
Lighter-Than-Air[a]	1,111	1,089	(b)	(b)	(b)
Recreational	—	—	87	161	187
Non-Pilots—TOTAL	448,710	468,405	492,237	517,462	540,548
Mechanics[c]	312,419	326,243	344,282	366,392	384,669
Parachute Rigger[c]	9,770	9,879	10,094	7,916	8,163
Ground Instructor[c]	62,582	64,503	66,882	70,086	73,276
Dispatcher[c]	10,020	10,455	11,002	11,607	12,264
Flight Navigator	1,400	1,357	1,290	1,225	1,154
Flight Engineer	52,519	55,968	58,687	60,236	61,022
Flight Instructor Certificates[d]	61,798	61,472	63,775	69,209	72,148
Instrument Ratings[d]	273,804	282,804	297,073	303,193	306,169

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

a Glider and lighter-than-air pilots are not required to have a medical examination; however, the totals above are the pilots who received a medical.

b Lighter-than-air type ratings are no longer being issued.

c No periodic medical examination required; therefore, no determination as to current activity can be made.

d Special ratings shown on pilot certificates represented above, not additional certificates.

HELIPORTS/HELIPADS[a] IN THE UNITED STATES

By State
As of 1992

State	Total Helipads in state	Private Use		Public Use	
		Heliports & Helistops	Helipads at Airports	Heliports & Helistops	Helipads at Airports
Alabama	55	53	—	1	1
Alaska	26	16	1	6	3
Arizona	88	86	—	—	2
Arkansas	73	70	1	—	2
California	386	370	3	—	13
Colorado	174	170	1	—	3
Connecticut	71	65	1	3	2
Delaware	12	11	—	1	—
District of Columbia	18	18	—	—	—
Florida	227	224	1	1	1
Georgia	97	96	—	—	1
Hawaii	17	14	—	1	2
Idaho	28	26	1	—	1
Illinois	240	229	3	8	—
Indiana	106	100	3	2	1
Iowa	72	71	—	—	1
Kansas	32	28	—	—	4
Kentucky	34	34	—	—	—
Louisiana	204	198	2	3	1
Maine	15	13	—	1	1
Maryland	49	46	1	2	—
Massachusetts	114	110	—	1	3
Michigan	63	61	1	1	—
Minnesota	38	33	1	—	4
Mississippi	31	31	—	—	—
Missouri	108	100	1	4	3
Montana	19	17	—	2	—
Nebraska	23	22	1	—	—
Nevada	22	22	—	—	—
New Hampshire	44	34	—	9	1

(Continued on next page)

HELIPORTS/HELIPADS[a] IN THE UNITED STATES

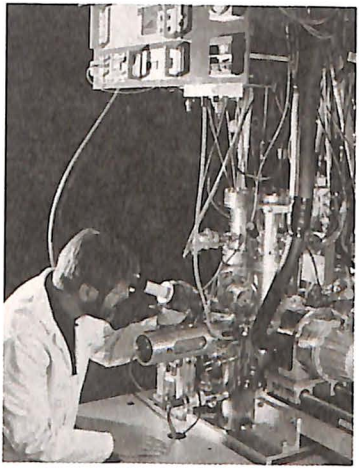
(Continued)
By State
As of 1992

State	Total Helipads in state	Private Use		Public Use	
		Heliports & Helistops	Helipads at Airports	Heliports & Helistops	Helipads at Airports
New Jersey	217	212	—	3	2
New Mexico	20	17	1	2	—
New York	128	117	—	9	2
North Carolina	55	53	—	2	—
North Dakota	7	7	—	—	—
Ohio	197	176	1	16	4
Oklahoma	87	83	—	4	—
Oregon	85	81	2	2	—
Pennsylvania	279	270	1	8	—
Rhode Island	12	11	—	1	—
South Carolina	24	22	—	—	2
South Dakota	9	9	—	—	—
Tennessee	67	61	2	3	1
Texas	402	387	2	9	4
Utah	37	34	—	—	3
Vermont	17	17	—	—	—
Virginia	107	103	—	—	4
Washington	102	97	2	—	3
West Virginia	27	27	—	—	—
Wisconsin	64	64	—	—	—
Wyoming	15	14	—	—	1
Total U.S.	4,444	4,230	33	105	76

Source: Helicopter Association International, "1993 Helicopter Annual" (Annually).
NOTE: 95.9 percent of all U.S. helicopter landing areas are private, while 4.1 percent are public.
a Excludes temporary heliports, offshore heliports, and infrequently used helicopter landing sites.

Research and Development

In 1992, total U.S. funding for research and development (R&D) amounted to $154.5 billion, according to the National Science Foundation's (NSF) Annual Survey of Industrial Research and Development. The figure compares with $145.4 billion in 1991.



American industry was the principal source of R&D funding. Industry provided $81.1 billion, or 52 percent of the total; federal government invested $65.1 billion (42 percent). Other sources of R&D support were colleges and universities ($5.4 billion), and nonprofit institutions ($2.9 billion).

According to the NSF survey, industry performed 70 percent of the R&D as measured by dollar value. Colleges and universities performed 12 percent and federal government facilities performed 11 percent.

For 1993, NSF estimated that the national total for R&D funding would reach $160.8 billion and that industry would again be the leading source of funding by investing $83.6 billion or more than 50 percent of the total. The federal government was expected to provide $68 billion (42 percent) of total U.S. R&D funding. As for R&D performance, NSF predicted that industry would accomplish 70 percent of the work (as in 1992); colleges and universities would perform 13 percent and federal facilities 10 percent.

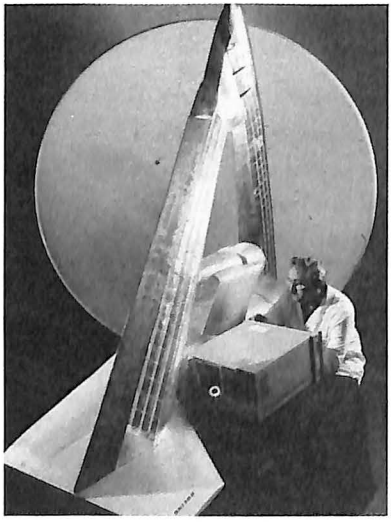
In 1991, the latest year for which figures are available, the aerospace industry performed 21 percent of all U.S. industrial R&D. The value of the aerospace R&D conducted was $21.7 billion, a figure compounded of $15.1 billion in federal funding and $6.6 billion of company funds. The total aerospace R&D value represented a drop of more than 14 percent below the previous year's level. The decline was due to a significant reduction (more than $4 billion) in federal funding, which dipped for the third consecutive year.

1993-94

With respect to federal funding of overall R&D, the Office of Management and Budget (OMB) projected increases for FY 1993/94. For FY 1993, OMB estimated funding at $68.6 billion, a six percent increase over the previous year's $64.7 billion. For FY 1994, OMB indicated that total outlays would amount to $70.4 billion.

A breakdown of the FY 1993 estimate shows that the Department of Defense (DoD) is providing some 55 percent of all federally-funded R&D. OMB put DoD outlays at $38.1 billion, up from $35.5 billion in FY 1992. NASA funding, at $7.8 billion, represents 11 percent of the total. The estimate for the Department of Energy is $6 billion.

Within the Department of Defense, the Air Force continues to be the leading conductor of research, development,



test and evaluation (RDT&E). A DoD projection estimates Air Force appropriations for RDT&E in FY 1994 at $13.7 billion, which compares with $13.2 billion in FY 1993. Navy appropriations are estimated at $9.2 billion (up from $8.9 billion) and the Army's at $5.3 billion (down from $6 billion).

In a different breakdown of the RDT&E budget, DoD showed the relative research emphasis (in terms of dollar value) among the six categories of RDT&E. By far the greatest emphasis in FY 1994 is on tactical programs with funding of $15.9 billion or 41 percent of the total RDT&E appropriation. Among the other categories of R&D being funded are intelligence and communications, $5.1 billion; defense-wide mission support, $4.8 billion; strategic programs, $4.8 billion; technology base, $4.4 billion; and advanced technology development, $3.6 billion.

A geographical breakdown of DoD prime contract awards shows that the Pacific region, the perennial leader, continued to top the list of RDT&E contracts awarded in FY 1992. Pacific area firms and other institutions won contracts amounting to $5.8 billion or 27.4 percent of the $21.2 billion total. In second place was the South Atlantic region with $4.6 billion, 21.4 percent, followed by Middle Atlantic, $2.9 billion, 13.5 percent; Mountain, $2.2 billion, 10.5 percent; New England, $2.1 billion, 9.9 percent; West South Central, $1.2 billion, 5.8 percent; East North Central, $864 million, 4.1 percent; West North Central, $832 million, 3.9 percent; and East South Central, $733 million, 3.5 percent.

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

By Funding Source
Calendar Years 1977–1991
(Millions of Dollars)

Year	All Industries[a]			Aerospace Industry[b]		
	Total	Federal Funds	Company Funds[c]	Total	Federal Funds	Company Funds[c]
CURRENT DOLLARS						
1977	$ 29,825	$10,485	$19,340	$ 7,033	$ 5,486	$1,547
1978	33,304	11,189	22,115	7,536	5,713	1,823
1979	38,226	12,518	25,708	8,041	5,840	2,201
1980	44,505	14,029	30,476	9,198	6,628	2,570
1981	51,810	16,382	35,428	11,968	8,528	3,440
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	97,889	32,117	65,772	25,900	19,877	6,023
1989	101,854	31,292	70,562	25,638	19,633	6,005
1990[r]	104,606	30,626	73,980	25,356	19,216	6,140
1991	102,246	25,308	76,938	21,692	15,104	6,588
CONSTANT DOLLARS (1987 = 100)[d]						
1977	$ 53,383	$18,767	$34,616	$12,588	$ 9,819	$2,769
1978	55,240	18,559	36,681	12,500	9,476	3,024
1979	58,316	19,097	39,219	12,267	8,909	3,358
1980	62,062	19,564	42,499	12,827	9,243	3,584
1981	65,699	20,774	44,925	15,176	10,814	4,362
1982	70,021	22,141	47,881	17,253	12,255	4,998
1983	74,883	23,726	51,156	17,676	13,075	4,601
1984	82,153	25,696	56,457	20,712	15,479	5,232
1985	89,265	28,818	60,446	23,557	17,571	5,986
1986	90,614	28,777	61,837	21,719	15,460	6,259
1987	92,155	30,752	61,403	24,458	18,519	5,939
1988	94,260	30,926	63,334	24,940	19,140	5,800
1989	93,944	28,862	65,082	23,647	18,108	5,539
1990[r]	92,678	27,134	65,544	22,465	17,025	5,440
1991	86,796	21,484	65,312	18,414	12,822	5,593

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 implicit price deflator.

r Revised.

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

Calendar Years 1990–1993
(Millions of Current Dollars)

Source of Funds	TOTAL, All Performers	Performer				
		Federal Government	Industry	Colleges & Universities	Federally-Funded Research & Development Centers	Non-Profit Institutions
1990[r]						
All Sources—TOTAL ..	$146,434	$16,002	$104,606	$16,344	$4,832	$4,650
Federal Government	63,996	16,002	30,626	9,636	4,832	2,900
Industry	75,714	—	73,980	1,134	—	600
Colleges & Universities .	4,356	—	—	4,356	—	—
Nonprofit Institutions	2,368	—	—	1,218	—	1,150
1991						
All Sources—TOTAL ..	$145,383	$15,238	$102,246	$17,620	$5,079	$5,200
Federal Government	59,146	15,238	25,308	10,221	5,079	3,300
Industry	78,804	—	76,938	1,216	—	650
Colleges & Universities .	4,850	—	—	4,850	—	—
Nonprofit Institutions	2,583	—	—	1,333	—	1,250
1992[p]						
All Sources—TOTAL ..	$154,500	$16,600	$107,800	$19,050	$5,300	$5,750
Federal Government	65,150	16,600	28,800	10,800	5,300	3,650
Industry	81,050	—	79,000	1,350	—	700
Colleges & Universities .	5,400	—	—	5,400	—	—
Nonprofit Institutions	2,900	—	—	1,500	—	1,400
1993[E]						
All Sources—TOTAL ..	$160,750	$16,600	$112,300	$20,550	$5,300	$6,000
Federal Government	68,000	16,600	31,000	11,400	5,300	3,700
Industry	83,550	—	81,300	1,500	—	750
Colleges & Universities .	6,000	—	—	6,000	—	—
Nonprofit Institutions	3,200	—	—	1,650	—	1,550

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.

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

Calendar Years 1978–1991

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	4.7	3.1	15.6	3.6
1989	4.6	3.2	15.3	3.6
1990	4.7[r]	3.3[r]	14.3	3.5
1991	4.7	3.5	12.5	3.8

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.
r Revised.

FEDERAL AERONAUTICS RESEARCH AND DEVELOPMENT

Fiscal Years 1973–1992
(Millions of Dollars)

Year	TOTAL	NASA[a]	DOD[b]	DOT[c]
BUDGET AUTHORITY				
1973	$ 2,187	$ 313	$1,799	$ 75
1974	2,030	278	1,678	74
1975	2,015	314	1,627	74
1976	2,351	325	1,941	85
Tr.Qtr.	584	83	480	22
1977	2,727	378	2,256	93
1978	3,338	437	2,807	94
1979	2,850	519	2,240	91
1980	2,991	560	2,336	95
1981	3,286	526	2,653	106
1982	3,581	516	2,984	81
1983	3,871	547	3,221	103
1984	4,087	600	3,224	263
1985	4,355	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[r]	968	6,149[r]	2,300
1992[E]	11,138	1,117	7,394	2,627
OUTLAYS				
1982[d]	$ 3,309	$ 563	$2,657	$ 89
1983	3,554	563	2,920	71
1984	3,727	586	2,995	146
1985	4,010	643	3,101	266
1986	6,071	648	4,373	1,050
1987	5,866	622	4,182	1,062
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[r]	9,501	1,017	6,793	1,691
1992[E]	10,011	1,122	6,790	2,099

Source: NASA, "Aeronautics and Space Report of the President" (Annually).
a Research and Development, Construction of Facilities, Research and Program Management.
b Research, Development, Testing, 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.
r Revised.
Tr.Qtr. See Glossary.

FEDERAL AERONAUTICS RESEARCH AND DEVELOPMENT IN CONSTANT DOLLARS[a]

Fiscal Years 1973–1992
(Millions of Constant Dollars)

Year	TOTAL	NASA[b]	DOD[c]	DOT[d]
BUDGET AUTHORITY				
1973	$5,438	$778	$4,473	$ 186
1974	4,691	642	3,878	171
1975	4,235	660	3,420	156
1976	4,590	635	3,790	166
Tr.Qtr.	1,083	154	891	41
1977	4,924	683	4,074	168
1978	5,603	734	4,712	158
1979	4,402	802	3,460	141
1980	4,238	793	3,310	135
1981	4,226	676	3,412	136
1982	4,286	618	3,572	97
1983	4,448	629	3,701	118
1984	4,499	660	3,549	289
1985	4,617	687	3,628[r]	281
1986	6,857	619	5,073	1,166
1987	5,824	698	4,179	946
1988	6,730	698	4,814	1,218
1989	9,846	806	7,613	1,427[r]
1990[r]	9,488	827	6,982	1,678
1991[r]	8,063	829	5,265	1,969
1992	9,274	930	6,157	2,187
OUTLAYS				
1982[e]	$3,961	$674	$3,180	$ 107
1983	4,084	647	3,356	82
1984	4,102	645	3,297	161
1985	4,251	682	3,288	282
1986	6,251	667	4,503	1,081
1987	5,866	622	4,182	1,062
1988	6,118	655	4,292	1,171
1989	7,845	790	5,932	1,124
1990[r]	8,883	789	6,789	1,306
1991[r]	8,134	871	5,816	1,448
1992	8,336	934	5,654	1,748

Source: AIA, derived from NASA, "Aeronautics and Space Report of the President" (Annually).
a Based on Fiscal Year GDP implicit price deflator, 1987=100.
b Research and Development, Construction of Facilities, Research and Program Management.
c Research, Development, Test, and Evaluation of aircraft and related equipment.
d Federal Aviation Administration: Research, Engineering, and Development; and Facilities, Engineering, and Development.
e First year outlays data available.
r Revised.
Tr.Qtr. See Glossary.

FUNDS FOR INDUSTRIAL RESEARCH AND DEVELOPMENT IN THE AEROSPACE INDUSTRY

By Type of Research and Funding Source
Calendar Years 1963–1991
(Millions of Dollars)

Year	TOTAL AERO-SPACE	Basic Research			Applied Research			Development		
		Total	Federal Funds	Com-pany Funds	Total	Federal Funds	Com-pany Funds	Total	Federal Funds	Com-pany Funds
1963	$ 4,712	$ 59	$ 31	$ 28	$ 735	$ 585	$ 150	$ 3,917	$ 3,634	$ 283
1964	5,078	67	34	34	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[r]	25,638	668	553	116	3,081	2,113	968	21,889	16,967	4,921
1990[r]	25,356	658	519	139	3,340	1,931	1,409	21,358	16,766	4,592
1991	21,692	559	471	89	3,248	1,731	1,517	17,884	12,902	4,982

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.
NA Not available.
r Revised.

FEDERAL OUTLAYS FOR CONDUCT OF RESEARCH AND DEVELOPMENT

Fiscal Years 1980–1994
(Millions of Dollars)

Year	TOTAL	DOD	NASA	Energy[a]	Other[b]
CURRENT DOLLARS					
1980	$30,235	$13,469	$4,711	$4,808	$ 7,247
1981	34,168	15,739	5,279	4,381	8,769
1982	34,660	18,363	3,220	5,178	7,899
1983	35,900	20,566	2,538	4,924	7,872
1984	40,986	23,850	3,539	5,182	8,415
1985	47,216	28,165	2,970	6,954	9,127
1986	52,141	33,396	3,432	5,392	9,921
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	65,965	35,330	7,072	9,674	13,889
1992	64,728	35,504	7,617	6,043	15,565
1993[E]	68,605	38,065	7,830	5,953	16,757
1994[E]	70,429	38,925	8,209	6,013	17,281
CONSTANT DOLLARS[r] (1987 = 100)[c]					
1980	$42,838	$19,083	$6,675	$6,812	$10,268
1981	43,940	20,240	6,789	5,634	11,277
1982	41,484	21,978	3,854	6,197	9,454
1983	41,255	23,634	2,917	4,577	9,046
1984	45,114	26,252	3,895	4,346	9,263
1985	50,059	29,861	3,149	4,393	9,677
1986	53,687	34,386	3,534	4,109	10,215
1987	53,256	34,732	3,250	3,967	10,012
1988	54,135	34,358	3,698	5,145	10,934
1989	56,140	34,943	4,597	5,249	11,351
1990	56,634	33,946	5,614	5,287	11,788
1991	56,477	30,248	6,055	8,283	11,891
1992	53,895	29,562	6,342	5,032	12,960
1993[E]	55,776	30,947	6,366	4,840	13,624
1994[E]	55,896	30,893	6,515	4,772	13,715

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 implicit price deflator.
E Estimate. Latest year reflects Administration's budget proposal.
r Revised.

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

Fiscal Years 1992–1994
(Millions of Dollars)

	1992	1993[E]	1994[E]
TOTAL—APPROPRIATIONS FOR RDT&E	$38,116	$38,176	$38,620
BY APPROPRIATION			
Army	$ 6,437	$ 6,015	$ 5,250
Navy	8,643	8,934	9,216
Air Force	13,139	13,156	13,695
Defense Agencies	9,674	9,801	10,175
Director of Test & Evaluation, Defense	210	259	273
Director of Operational Test & Evaluation, Defense	13	12	13
BY RESEARCH CATEGORIES			
Research	$ 1,146	$ 1,324	$ 1,256
Exploratory Development	2,959	3,611	3,109
Advanced Development	10,324	10,843	9,387
Engineering Development	9,823	8,886	8,890
Management and Support	3,044	2,786	2,985
Operational Systems Development	10,822	10,727	12,993
RECAP OF BUDGET ACTIVITIES			
Technology Base	$ 4,104	$ 4,920	$ 4,376
Advanced Technology Development	6,314	4,053	3,607
Strategic Programs	4,240	6,345	4,776
Tactical Programs	14,313	14,131	15,904
Intelligence and Communications	4,921	4,702	5,113
Defensewide Mission Support	4,225	4,025	4,843
RECAP OF FYDP PROGRAMS			
Strategic Forces	$ 600	$ 361	$ 360
General Purpose Forces	2,808	2,652	3,948
Intelligence and Communications	6,885	7,194	7,668
Airlift/Sealift	11	12	32
Research and Development (FYDP Program 6)	27,295	27,449	25,628
Central Supply and Maintenance	210	262	52
Training Medical and Other	—	—	2
Administration and Associated Activities	5	5	2
Support of Other Nations	3	4	595
Special Operations Forces	300	235	331

Source: Department of Defense Budget, "R,D,T&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
OUTLAYS FOR RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
Fiscal Years 1972–1994
(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	4,382	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 E	37,328	12,768	9,087	5,825	9,648
1994 E	38,215	13,555	9,031	5,541	10,088

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

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

Fiscal Years 1988–1992
(Millions of Dollars)

Program Categories	1988	1989	1990	1991	1992
TOTAL—RDT&E	$22,543	$23,206	$22,319	$20,898	$21,730
Research	1,444	1,429	994	1,063	1,195
Exploratory Development	1,623	1,581	1,813	2,288	2,159
Other Development	18,937	18,966	18,697	16,424	16,975
Management & Support	538	1,230	815	1,124	1,401
Aircraft—TOTAL	$ 5,055	$ 4,689	$ 4,364	$ 3,143	$ 4,022
Research	139	11	(191)	13	18
Exploratory Development	125	85	82	83	74
Other Development	4,777	4,563	4,431	3,002	3,873
Management & Support	14	30	42	45	58
Missile and Space Systems—TOTAL	7,800	6,962	6,865	6,649	5,730
Research	106	260	175	95	98
Exploratory Development	340	331	308	710	489
Other Development	7,218	6,277	6,291	5,759	5,084
Management & Support	135	95	91	86	59
Electronics & Communications Equipment—TOTAL	3,854	3,744	3,925	3,814	4,265
Research	137	182	188	127	147
Exploratory Development	251	289	327	299	369
Other Development	3,417	3,190	3,337	3,323	3,723
Management & Support	49	83	73	64	27
All Other—TOTAL[a]	5,834	7,811	7,165	7,292	7,713
Research	1,062	976	822	827	933
Exploratory Development	907	876	1,097	1,196	1,228
Other Development	3,525	4,936	4,637	4,341	4,295
Management & Support	340	1,022	609	928	1,258

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 "All Other" includes ships, tank-automotive, weapons, ammunition, services, and other.
() Reflects net cancellations.

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 1992

REGION	TOTAL	Type of Contractor		
		Educational Institutions	Other Non-Profit Institutions[a]	Business Firms
TOTAL—Millions of Dollars .	$21,219	$426	$1,877	$18,916
New England	$ 2,104	$ 34	$ 637	$ 1,434
Middle Atlantic	2,866	67	119	2,681
East North Central	864	42	54	768
West North Central	832	18	9	805
South Atlantic	4,550	87	618	3,846
East South Central	733	17	3	713
West South Central	1,226	21	51	1,154
Mountain	2,233	63	2	2,168
Pacific[b]	5,809	77	384	5,348
PERCENT OF TOTAL	100.0%	100.0%	100.0%	100.0%
New England	9.9%	7.9%	33.9%	7.6%
Middle Atlantic	13.5	15.6	6.3	14.2
East North Central	4.1	9.9	2.9	4.1
West North Central	3.9	4.2	0.5	4.3
South Atlantic	21.4	20.4	32.9	20.3
East South Central	3.5	4.1	0.2	3.8
West South Central	5.8	5.0	2.7	6.1
Mountain	10.5	14.8	0.1	11.5
Pacific[b]	27.4	18.1	20.5	28.3

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[a]

By Agency and Model
Fiscal Years 1992, 1993, and 1994
(Millions of Dollars)

Agency and Model	1992	1993[E]	1994[E]
AIR FORCE			
ACM	$ 39.3	$ 19.5	$ 25.4
AGM-130	20.6	7.7	1.9
AMRAAM[b]	32.6	35.9	85.0
Peacekeeper (M-X)	2.9	—	—
TSSAM[c]	NA	NA	433.2
NAVY			
HARM	$ 3.9	$ —	$ —
Harpoon	—	—	19.2
RAM	4.9	9.5	9.1
Standard	70.3	50.1	63.0
Tomahawk	28.2	27.0	41.6
Trident II	42.2	46.9	43.0
ARMY			
AATWS-M	$118.3	$ 95.9	$ 44.9
ATACMS	—	—	25.8
Avenger	2.5	11.8	7.4
* BAT	118.3	114.8	117.0
Laser Hellfire	21.3	4.7	3.1
MLRS	20.2	23.7	40.9
Patriot	37.9	36.3	37.7
TOW 2	33.1	—	37.5

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.
c Army, 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:

AATWS-M —Advanced Anti-Tank Weapon System-Medium
ACM —Advanced Cruise Missile
AMRAAM —Advanced Medium Range Air-to-Air Missile
ATACMS —Army TACtical Missile System
BAT —Brilliant Anti-Tank submunition
HARM —High-speed Anti-Radiation Missile
MLRS —Multiple Launch Rocket System
RAM —Rolling Airframe Missile
TOW —Tube-launched Optically-tracked Wire command link guided missile
TSSAM —Tri-Service Standoff Attack Missile

MILITARY AIRCRAFT PROGRAMS
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION[a]

By Agency and Model
Fiscal Years 1992, 1993, and 1994
(Millions of Dollars)

Agency and Model	1992	1993[E]	1994[E]
AIR FORCE			
B-1B	$ 5.3	$ 80.6	$ 93.5
B-2 Advanced Technology Bomber	1,522.3	1,189.3	790.5
C-17 Globemaster III	256.9	168.7	179.8
E-8A JSTARS	307.4	313.5	295.2
F-15E Eagle	92.9	59.9	91.5
F-16 Falcon	147.6	109.4	116.9
*F-22 Lightning	1,606.8	1,925.2	2,252.0
*JPATS[b]	—	—	41.5
*National Aerospace Plane	161.5	141.2	43.3
T-1A Jayhawk	3.1	2.3	2.2
NAVY			
AH-1W Sea Cobra	$ 11.1	$ 9.6	$ 5.6
AV-8B Harrier	9.1	11.7	18.3
*A/F-X	–	155.9	399.2
CH/MH-53E Super Stallion	8.8	11.6	5.6
E-2C Hawkeye	6.3	6.4	48.9
EA-6B Prowler	23.7	70.8	246.0
F-14D Tomcat	115.1	120.1	72.0
F/A-18 Hornet	418.7	895.5	1,485.5
SH-60B Seahawk (LAMPS MK-III)	33.8	34.4	45.3
SH-60F Carrier ASW	19.5	38.6	25.7
T-45 Goshawk	48.1	49.2	28.9
V-22 Osprey	758.7	714.4	77.4
ARMY			
*LONGBOW	$ 248.6	$ 290.0	$ 278.0
OH-58D AHIP	9.2	7.7	—
*RAH-66 Comanche	514.5	395.2	367.1
UAVs[c]	99.4	132.5	187.5
SPECIAL OPERATIONS			
AC-130U Spectre	$ 23.0	$ 6.5	$ 26.7
MC-130H Combat Talon II	3.3	—	—
MH-47E	12.2	0.4	9.9
MH-60K/L	23.0	4.7	19.8

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.
c Army, Navy, and Air Force funding.
E Estimate. Latest year reflects Administration's budget proposal.
* Programs in R&D only.

Foreign Trade

The year 1992 marked the eighth consecutive year in which the U.S. aerospace industry set a record for export volume. It also marked the sixth straight record aerospace trade balance.

In a year in which the U.S. as a whole experienced a merchandise trade deficit of $84.3 billion, aerospace exports topped $45 billion and thus contributed significantly to the U.S. trade position by offsetting deficits in other areas of trade. Although aerospace exports increased at a slower rate (2.8 percent) than in recent years, they nonetheless amounted to an even 10 percent of all U.S. merchandise export dollar value.

Aerospace imports increased more than five percent to $13.7 billion — a record level. The aerospace trade balance increased less than two percent, from $30.8 billion in 1991 to $31.4 billion in 1992.

As is generally the case, civil exports accounted for most of the aerospace export volume — more than 80 percent. The 1992 civil export total of $36.9 billion compares with $35.5 billion in 1991. In terms of dollar value, roughly two-thirds of the civil export volume was in sales of complete aircraft, principally airline transports. Military exports, at $8.1 billion, were down slightly from 1991's $8.2 billion.

A breakdown of civil exports shows sales of complete aircraft at $24.3 billion (up from $22.4 billion); aircraft and engine parts, $10 billion (down from $10.9 billion); and aircraft engines, $2.3 billion (up from $2.1 billion).

In the complete aircraft category, almost 92 percent of the total dollar value of exports was in sales of transport aircraft, $22.4 billion. The category also

1993-94

included exports of $581 million in general aviation aircraft (up from $576 million); $1.2 billion in used aircraft (up from $738 million); $118 million in civil helicopters (down from $168 million); and $180 million in a category listed as "Other, including spacecraft."

The military export total of $8.1 billion included $2.1 billion in complete aircraft (up from $1.8 billion); $4.2 billion in aircraft and engine parts (down from $4.9 billion); $1.4 billion in missiles, rockets and parts (up from $1.2 billion); and $229 million in aircraft engines (up from $206 million).

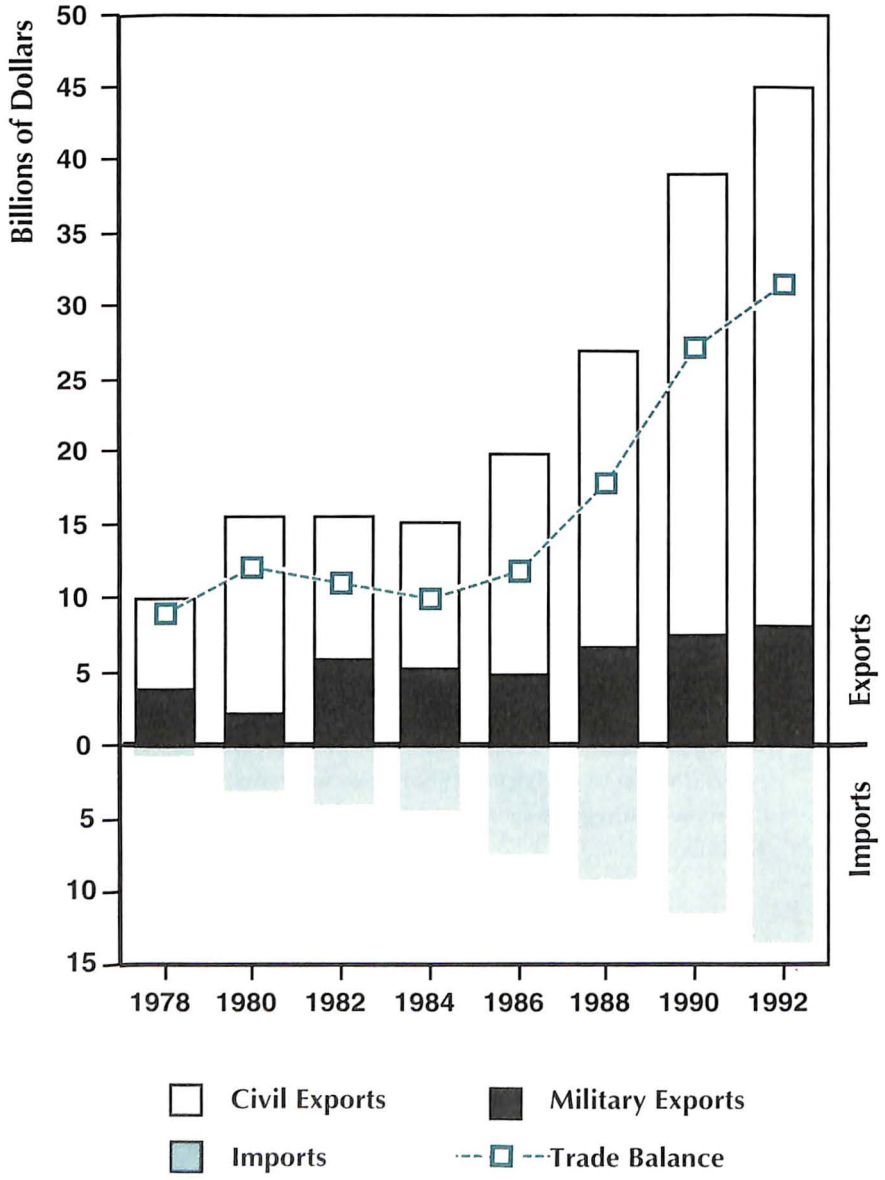
Civil products accounted for 71 percent of the aerospace import volume; the $13.7 billion total included $9.7 billion of civil imports (up from $9.3 billion) and $3.9 billion of military imports (up from $3.7 billion). Among civil imports in 1992, complete aircraft amounted to $3.9 billion (up from $3.4 billion); aircraft and engine parts, $4.5 billion (down from $4.6 billion); and aircraft engines, $1.3 billion (up from $1.2 billion).

More than half of the total of military imports was in aircraft and engine parts, $2.5 billion, the same as in the previous year. Aircraft engine imports accounted for virtually all the remainder, $1.4 billion (up from $1.2 billion).

The principal customers for U.S. aerospace exports in 1992 were Japan ($4.5 billion), France ($3.9 billion), the United Kingdom ($3.5 billion), Germany ($3 billion), Canada ($2.2 billion), China ($2.2 billion), Australia ($1.7 billion), South Korea ($1.7 billion), Taiwan ($1.4 billion), the Netherlands ($1.2 billion), Italy ($1.2 billion), Singapore ($1.1 billion) and Brazil ($1 billion).

France ($4.2 billion), the United Kingdom ($2.8 billion) and Canada ($2.4 billion) collectively accounted for more than two-thirds of all aerospace imports into the U.S.

Aerospace Exports, Imports, and Trade Balance



Source: Aerospace Industries Association

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

Calendar Years 1964–1992
(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[r]	(101,718)	393,592	495,311	27,282	39,083	11,801
1991[r]	(65,399)	421,730	487,129	30,785	43,788	13,003
1992	(84,265)	448,115	532,380	31,356	45,018	13,662

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.

r Revised.

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

Calendar Years 1988–1992
(Millions of Dollars)

Major Countries of Destination	1988	1989	1990	1991	1992
Australia	$1,208	$1,270[r]	$1,760	$1,596	$1,746
Belgium/Luxembourg	348	536[r]	681	825	506
Brazil	942	813	925	1,491	1,032
Canada	1,804	2,137	2,237	2,210	2,247
China	425	664	861	1,244	2,247
France	2,074	2,762[r]	3,299	4,359	3,912
Germany	1,415	3,134	2,798	3,936	3,043
Israel	454	453	503	738	957
Italy	578	625	737	1,051	1,214
Japan	2,710	2,700	4,185	3,907	4,505
Korea, South	823	1,257	1,113	1,715	1,713
Mexico	178	432	462	608	990
Netherlands	744	1,448	1,613	1,458	1,234
Singapore	505	1,133	844	1,278	1,067
Spain	691	1,103[r]	1,198	972	776
Sweden	627	815	952	1,081	632
Switzerland	294	458	283	1,226	575
Taiwan	164	460	733[r]	1,324	1,379
Thailand	148	210	552	865	1,008
United Kingdom	2,908	3,519[r]	4,966	3,961	3,483

Source: U.S. Department of Commerce, International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a Includes all civil products, free alongside ship basis; excludes military products whose country of destination are not reported.
r Revised.

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

Calendar Years 1988–1992
(Millions of Dollars)

Major Countries of Origin	1988	1989	1990	1991	1992
Brazil	$ 183	$ 204	$ 360	$ 186	$ 164
Canada	1,985	1,918	2,529	2,732	2,429
France	2,932	3,290	2,782	3,557	4,219
Germany, West	396	419	712	523	614
Israel	178	186	226	289	229
Italy	339	300	418	598	585
Japan	426	474	566	661	655
Netherlands	141	255	368	761	915
Sweden	246	257	317	332	234
United Kingdom	1,738	2,055	2,695	2,492	2,805

Source: U.S. Department of Commerce, International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a Includes civil and military products, c.i.f. (Cost, Insurance, and Freight) basis.

U.S. IMPORTS OF AEROSPACE PRODUCTS

Calendar Years 1989–1992
(Millions of Dollars)

Aerospace Imports	1989	1990	1991	1992
TOTAL	$10,028	$11,801	$13,003	$13,662
TOTAL CIVIL	$ 7,200	$ 8,251	$ 9,268	$ 9,719
Complete Aircraft—TOTAL	$ 2,788	$ 2,794	$ 3,413	$ 3,866
Transports	1,282	737	1,285	2,007
General Aviation	1,113	1,581	1,567	1,375
Helicopters	109	162	289	179
Other, Including Used Aircraft, & Gliders, Balloons, & Airships[a]	285	314	272	305
Aircraft Engines—TOTAL	999	1,234	1,226	1,346
Turbine Engines[b]	961	1,204	1,185	1,330
Piston Engines	38	31	42	16
Aircraft & Engine Parts—TOTAL	3,414	4,222	4,629	4,507
Aircraft Parts and Accessories[a]	2,305	2,751	3,166	2,726
Turbine Engine Parts[b]	924	1,147	1,279	1,516
Piston Engine Parts	136	57	43	50
Spacecraft, Other Parts & Accessories[c]	50	267	141	220
TOTAL MILITARY	$ 2,828	$ 3,550	$ 3,735	$ 3,943
Complete Aircraft—TOTAL	$ 17	$ 44	$ 26	$ 55
Aircraft Engines—TOTAL	971	1,217	1,203	1,368
Turbine Engines[b]	961	1,204	1,185	1,330
Piston Engines Including Parts	10	13	18	38
Aircraft & Engine Parts—TOTAL	1,841	2,290	2,507	2,521
Aircraft Parts[b]	797	858	1,033	717
Turbine Engine Parts[b]	881	1,088	1,238	1,484
Spacecraft, Missiles, Rockets, Other Parts, & Accessories[bc]	162	343	236	320

Source: Aerospace Industries Association, based on data from International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
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. IMPORTS OF COMPLETE AIRCRAFT

Calendar Years 1989–1992

Aircraft Imports	1989	1990	1991	1992
TOTAL NUMBER OF AIRCRAFT ...	702	848	1,036	1,024
Civil Aircraft—TOTAL	673	820	955	949
New Complete Aircraft:				
Helicopters	124	167	244	148
General Aviation:				
Single-Engine	53	80	72	67
Multi-Engine, Under 4,400 lbs ...	1	5	1	7
Multi-Engine, 4,400-10,000 lbs ...	32	53	41	18
Multi-Engine, Turbojet/Turbofan, 10,000-33,000 lbs	39	63	45	52
Multi-Engine, Other, Including Turboshaft, 10,000-33,000 lbs ..	87	100	95	72
Transports, Multi-Engine, Over 33,000 lbs	36	30	44	64
Other Civil Aircraft:				
Used or Rebuilt	210	130	246	176
Aircraft Previously Exported from U.S.	NA	NA	NA	NA
Gliders[a]	76	184	140	327
Balloons & Airships[a]	15	8	27	18
Military Aircraft—TOTAL	29[b]	28	81[b]	75[b]
New Complete Aircraft	25	28	8	11

(Continued on next page)

U.S. IMPORTS OF COMPLETE AIRCRAFT
(Continued)

Aircraft Imports	1989	1990	1991	1992
VALUE (Millions of Dollars)	$2,804.5	$2,838.3	$3,438.1	$3,920.7
Civil Aircraft—TOTAL	$2,788.1	$2,794.2	$3,412.7	$3,866.2
New Complete Aircraft:				
Helicopters	108.7	162.4	288.8	179.2
General Aviation:				
Single-Engine	6.7	9.0	23.4	24.6
Multi-Engine, Under 4,400 lbs	0.1	1.3	0.0	3.1
Multi-Engine, 4,400-10,000 lbs	119.1	217.3	176.3	75.7
Multi-Engine, Turbojet/Turbofan, 10,000-33,000 lbs	372.0	643.6	526.9	612.0
Multi-Engine, Other, Including Turboshaft, 10,000-33,000 lbs	614.9	709.9	840.3	659.5
Transports, Multi-Engine, Over 33,000 lbs	1,281.8	737.0	1,285.3	2,006.9
Other Civil Aircraft:				
Used or Rebuilt	236.7	292.4	269.5	301.4
Aircraft Previously Exported from U.S.	48.8	0.4	—	—
Gliders[a]	0.3	0.8	0.9	2.3
Balloons & Airships[a]	0.6	2.3	1.3	1.4
Military Aircraft—TOTAL	$ 16.5[b]	$ 44.2	$ 25.5[b]	$ 54.6[b]
New Aircraft	16.4	44.2	21.0	46.0

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.
b Includes used aircraft.
NA Not available.

TOTAL U.S. EXPORTS AND EXPORTS OF AEROSPACE PRODUCTS

Calendar Years 1964–1992
(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	Trans-ports	
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[r]	39,083	9.9	31,517	16,691	7,566
1991	421,730[r]	43,788	10.4	35,548	20,881	8,239
1992	448,115	45,018	10.0	36,904	22,379	8,114

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.
r Revised.

U.S. EXPORTS OF AEROSPACE PRODUCTS

Calendar Years 1989–1992
(Millions of Dollars)

Aerospace Exports	1989	1990	1991	1992
TOTAL	$32,111	$39,083	$43,788	$45,018
TOTAL CIVIL	$25,619	$31,517	$35,548	$36,904
Complete Aircraft—TOTAL	$13,447	$18,150	$22,385	$24,333
Transports	12,313	16,691	20,881	22,379
General Aviation[a]	413	555	576	581
Helicopters	156	161	168	118
Used Aircraft	533	712	738	1,244
Other, Incl. Spacecraft	217[b]	360[b]	176[b]	180[b]
Aircraft Engines—TOTAL	1,948	1,754	2,127	2,346
Turbine Engines	1,856	1,679	2,050	2,271
Piston Engines	93	75	77	74
Aircraft and Engine Parts Incl. Spares—TOTAL	10,019	11,257	10,878	10,048
Aircraft Parts & Accessories	6,258	6,964	6,859	6,545
Aircraft Engine Parts	3,761	4,293	4,018	3,503
TOTAL MILITARY	$ 6,492	$ 7,566	$ 8,239	$ 8,114
Complete Aircraft—TOTAL[c]	$ 892	$ 1,481	$ 1,788	$ 2,086
Fighters & Fighter Bombers	368	533	323	1,288
Transports	234	432	633	149
Helicopters	180	381	587	422
Used Aircraft	56	75	146	81
Other, Incl. Spacecraft	246[b]	391[b]	253[b]	315[b]
Aircraft Engines—TOTAL	236	203	206	229
Turbine Engines	198	168	171	199
Piston Engines	38	35	35	30
Aircraft and Engine Parts Incl. Spares—TOTAL	4,134	4,261	4,891	4,208
Aircraft Parts & Accessories	3,450	3,640	4,202	3,603
Aircraft Engine Parts	684	622	689	605
Guided Missiles, Rockets, & Parts—TOTAL	1,037	1,290	1,200	1,422
Guided Missiles & Rockets	375	551	298	576
Missile & Rocket Parts	656	724	899	839
Missile & Rocket Engines	6	15	3	6
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. EXPORTS OF CIVIL AIRCRAFT

Calendar Years 1988–1992

Civil Aircraft Exports	1988	1989	1990	1991	1992
TOTAL NUMBER OF AIRCRAFT	2,784	3,564[b]	3,375[b]	3,071[b]	1,988[b]
Helicopters—TOTAL	280	294	349	318	212
Under 2,200 lbs	161	186	266	246	175
Over 2,200 lbs	119	108	83	72	37
General Aviation—TOTAL	643	1,310	809	534	358
Single-Engine	459	1,119	561	345	186
Multi-Engine, Under 4,400 lbs	51	39	33	22	19
Multi-Engine, 4,400-10,000 lbs	109	104	136	98	93
Multi-Engine, 10,000-33,000 lbs	24	48	79	69	60
Transports—TOTAL	217	260	306	385	387
Passenger Aircraft, Over 33,000 lbs	205	256	294	371	376
Cargo Aircraft, Over 33,000 lbs	8	1	3	5	1
Other, Over 33,000 lbs, Incl. Pass./Cargo Combi	4	3	9	9	10
Other Aircraft—TOTAL	1,644	1,700[b]	1,911[b]	1,834[b]	1,031[b]
Used or Rebuilt Aircraft	1,644	1,700	1,911	1,834	1,031
Other Aircraft, Including Balloons, Gliders, & Kites[a]	NA	2,888	1,448	1,133	386
TOTAL VALUE (Millions of Dollars)	$10,296	$13,447	$18,150	$22,385	$24,333
Helicopters—TOTAL	$ 219	$ 156	$ 161	$ 168	$ 118
Under 2,200 lbs	30	29	39	40	35
Over 2,200 lbs	189	127	123	129	83
General Aviation—TOTAL	348	413	555	576	581
Single-Engine	47	56	44	40	61
Multi-Engine, Under 4,400 lbs	12	9	10	8	12
Multi-Engine, 4,400-10,000 lbs	239	184	256	249	213
Multi-Engine, 10,000-33,000 lbs	49	164	245	279	295
Transports—TOTAL	8,766	12,313	16,691	20,881	22,379
Passenger Aircraft, Over 33,000 lbs	7,770	11,859	15,307	19,349	21,252
Cargo Aircraft, Over 33,000 lbs	599	90	264	405	37
Other, Over 33,000 lbs, Incl. Pass./Cargo Combi	396	364	1,121	1,127	1,090
Other Aircraft—TOTAL	963	566[r]	742	760	1,256
Used or Rebuilt Aircraft	639	533	712	738	1,244
Other Aircraft, Including Balloons, Gliders, & Kites[a]	323	33	30	23	12

Source: Aerospace Industries Association, based on data from International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a Included spacecraft until 1989.
b Numbers of gliders, balloons, & kites excluded from civil aircraft totals.
NA Not available.
r Revised.

U.S. EXPORTS OF CIVIL HELICOPTERS[a]

Calendar Years 1988–1992

Region of Destination	1988	1989	1990	1991	1992
TOTAL NUMBER EXPORTED ..	280	294	349	318	212
Canada & Greenland	17	11	11	20	8
Latin America & Caribbean	25	54	46	45	46
Europe	131	170	140	125	91
Middle East	15	6	1	2	3
Asia	52	51	65	66	39
Oceania	31	33	68	38	19
Africa	9	9	18	22	6
TOTAL VALUE (Millions of Dollars)	$218.6	$155.5	$161.2	$168.4	$117.7
Canada & Greenland	$ 5.2	$ 2.6	$ 5.1	$ 7.9	$ 5.0
Latin America & Caribbean	24.5	39.7	20.1	19.6	26.2
Europe	36.0	37.1	46.8	56.3	38.2
Middle East	70.6	5.4	3.6	16.5	2.2
Asia	68.1	60.0	71.3	59.2	42.5
Oceania	10.3	9.2	8.7	5.7	2.3
Africa	3.9	1.6	5.6	3.1	1.3

Source: Aerospace Industries Association, based on data from the International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a Excludes used helicopters.

U.S. IMPORTS OF CIVIL HELICOPTERS[a]

Calendar Years 1988–1992

Country of Origin	1988	1989	1990	1991	1992
TOTAL NUMBER IMPORTED ...	114	124	167	244[r]	148
Canada	33	52	82	146	104
France	30	45	49	57	25
Germany	43	25	25	30	16
Italy	7	2	11	10	1
Others[b]	1	—	—	1[r]	2
TOTAL VALUE (Millions of Dollars)	$103.9	$108.7	$162.4	$288.2[r]	$179.2
Canada	$ 21.5	$ 44.5	$ 86.3	$182.1	$147.4
France	21.6	32.0	29.9	53.6	14.0
Germany	50.1	28.9	34.9	35.6	14.8
Italy	10.5	3.3	11.3	16.9	2.1
Others[b]	0.2	—	—	0.7[r]	0.9

Source: Aerospace Industries Association, based on data from the International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a Excludes used helicopters.
b Includes 1 from United Kingdom in 1988; 1 from New Zealand in 1991; and 2 from Japan in 1992.
r Revised.

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

Calendar Years 1988–1992

Region of Destination	1988	1989	1990	1991	1992
TOTAL NUMBER EXPORTED	643	1,310	809	534	358
Canada & Greenland	14	35	34	9	21
Latin America & Caribbean	100	155	133	80	78
Europe	322	634	379	317	142
Middle East	2	7	15	11	13
Asia	50	154	55	54	47
Oceania	125	164	72	18	22
Africa	30	161	121	45	35
TOTAL VALUE (Millions of Dollars)	$347.7	$413.1	$554.9	$576.0	$580.8
Canada & Greenland	$ 12.8	$ 11.7	$ 41.7	$ 31.2	$ 55.3
Latin America & Caribbean	114.0	120.4	152.8	142.9	191.8
Europe	126.7	168.0	197.1	253.1	169.5
Middle East	0.1	4.7	18.1	21.7	17.9
Asia	38.7	43.0	47.9	95.0	36.3
Oceania	35.8	18.0	22.0	6.9	41.0
Africa	19.6	47.4	75.3	25.2	69.0

Source: Aerospace Industries Association, based on data from the International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a All fixed-wing aircraft under 33,000 pounds.

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

Calendar Years 1988–1992

Country of Origin	1988	1989	1990	1991	1992
TOTAL NUMBER IMPORTED	269	212	301	254	216
Brazil	30	30	51	24	21
Canada	40	31	32	42	50
France	60	65	93	92	81
Israel	5	8	12	8	5
Japan	29	—	—	—	—
United Kingdom	64	49	77	48	37
Other	41	38	36	40	22
TOTAL VALUE (Millions of Dollars)	$1,369.0	$1,112.8	$1,581.2	$1,566.8	$1,374.9
Brazil	$ 163.8	$ 175.6	$ 306.9	$ 152.2	$ 136.3
Canada	268.6	275.2	354.7	469.8	527.2
France	532.7	335.0	336.2	469.9	388.9
Israel	24.6	41.5	70.6	51.7	33.6
Japan	23.9	—	—	—	—
United Kingdom	271.7	212.7	414.6	276.9	235.1
Other	83.7	72.8	98.1	146.3	53.8

Source: Aerospace Industries Association, based on data from the International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a All fixed-wing aircraft under 33,000 pounds.

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

Calendar Years 1988–1992

Region of Destination	1988	1989	1990	1991	1992
TOTAL NUMBER EXPORTED ..	217	260	306	385	387
Canada & Greenland	10	9	4	3	7
Latin America & Caribbean	15	28	25	32	40
Europe	127	151	172	228	171
Middle East	4	8	9	16	17
Asia	41	47	70	83	120
Oceania	11	8	16	14	23
Africa	9	9	10	9	9
TOTAL VALUE (Millions of Dollars)	$8,766	$12,313	$16,691	$20,881	$22,379
Canada & Greenland	$ 547	$ 535	$ 309	$ 221	$ 610
Latin America & Caribbean	669	726	1,001	1,472	1,904
Europe	3,944	6,335	8,166	10,461	8,105
Middle East	227	631	440	648	625
Asia	2,404	2,951	5,010	6,382	9,201
Oceania	503	640	1,256	1,177	1,461
Africa	471	496	509	520	471

Source: Aerospace Industries Association, based on data from the International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a Airframe weight exceeding 33,000 pounds.

U.S. EXPORTS OF MILITARY AIRCRAFT[a]

Calendar Years 1988–1992

	1988	1989	1990	1991	1992
TOTAL NUMBER OF AIRCRAFT ...	743	846	445	490	428
Fighters and Fighter Bombers	87	32	39	16	65
Transports	14	74	43	40	4
Helicopters	53	36	47	72	61
New Aircraft, NEC[b]	464	505	259	235	249
Used or Rebuilt Aircraft	125	199	57	127	49
Airships, Balloons, Gliders, etc.	NA	NA	NA	NA	NA
TOTAL VALUE (Millions of Dollars) .	$2,157	$892	$1,481	$1,783	$2,083
Fighters and Fighter Bombers	$1,469	$368	$ 533	$ 323	$1,288
Transports	212	234	432	633	149
Helicopters	198	180	381	587	422
New Aircraft, NEC[b]	173	53	61	98	147
Used or Rebuilt Aircraft	59	56	75	142	78
Airships, Balloons, Gliders, etc.	46	—[c]	—[c]	—[c]	—[c]

Source: Aerospace Industries Association, based on data from the International Trade Administration.
NOTE: International trade reported using Harmonized Tariff Schedules after 1988.
a Includes aircraft exported under Military Assistance Programs and Foreign Military Sales.
b Includes spacecraft until 1989.
c Products within this category are not designated civil or military by the Harmonized Tariff Schedules. Historically, these products have been predominantly civil.
NA Not available.
NEC Not elsewhere classified.

U.S. EXPORTS OF AIRCRAFT ENGINES

Calendar Years 1990–1992
(Values in Millions of Dollars)

	1990		1991		1992	
	Number	Value	Number	Value	Number	Value
TOTAL	9,419	$1,957	10,651	$2,333	10,742	$2,575
Turbine Engines	3,008	$1,846	3,199	$2,221	3,464	$2,471
Civil	2,277	1,679	2,114	2,050	2,250	2,271
Military	731	168	1,085	171	1,214	199
Piston Engines	6,411	110	7,452	112	7,278	104
Civil, New, Under 500 HP	1,108	15	1,168	17	782	13
Civil, New, Over 500 HP	256	10	76	4	115	3
Civil, Used	3,183	50	3,486	56	3,743	58
Military	1,864	35	2,722	35	2,638	30

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

U.S. IMPORTS OF AIRCRAFT ENGINES[a]

Calendar Years 1990–1992
(Values in Millions of Dollars)

	1990		1991		1992	
	Number	Value	Number	Value	Number	Value
Turbine Engines	5,007	$2,408	2,032	$2,370	1,961	$2,660
Piston Engines	3,152	36	9,379	53	2,987	43
Military	251	5	6,648	12	1,828	27
Civil, New, Small	2,070	5	2,085	3	337	1
Civil, New, Large	136	15	29	29	466	1
Civil, Used	695	11	617	9	356	14

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 1981–1992
(Millions of Dollars)

LOANS

Year	Lending Authority	Authorizations Summary		
		Direct Loans[a]		
		TOTAL	Direct Credits	Other[b]
1981	$ 5,461	$ 5,431	$5,079[c]	$ 352
1982	4,400	3,516	3,104	412
1983	4,400	845	685	160
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[r]	517	202
1990	614	614	318	296
1991	750	604	410	194
1992	(d)	817	661	156

GUARANTEES AND INSURANCE

Year	Lending Authority	Authorizations Summary		
		TOTAL	Guarantees	Insurance
1981	$ 8,059	$ 7,416	$1,506	$5,910
1982	9,220	5,832	727	5,105
1983	9,000	8,525	1,741	6,784
1984	10,000	7,151	1,333	5,818
1985	10,000	7,850	1,320	6,530
1986	11,484[e]	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	10,599	6,034	4,619
1992	(d)	8,610	3,910	4,700

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 Includes $34 million from the Cooperative Financing Facility program discontinued after 1981.

d No lending limit set for FY92 instead lending subsidy limited to $603,000.

e 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.

r Revised.

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

Fiscal Years 1979–1992
(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]					
1979	$4,475	$1,469.4	32.8%	$1,399.4	$ 70.0
1980	4,578	1,743.3	38.1	1,692.6	50.7
1981	5,431	2,576.6	47.4	2,550.3	26.3
1982	3,516	263.9	7.5	199.1	64.8
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	604	—	—	—	—
1992	817	—	—	—	—
GUARANTEES[d]					
1979	$ 908	$ 261.4	28.8%	$ 239.3	$ 22.1
1980	2,510	1,131.9	45.1	1,088.1	43.8
1981	1,506	562.6	37.4	533.4	29.2
1982	727	104.2	14.3	78.4	25.8
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[r]	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[r]	606.0	10.1	566.9[r]	40.0
1992	7,301	1,667.0	22.8	1,597.1	69.9

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 Export-Import Bank to foreign buyers of U.S. equipment and services, including Direct Credits, loans authorized under the Cooperative Financing Facilty (CFF), (until the termination of the CFF program in 1981), and Discount Loans, which are made to commercial banks and may subsequently be guaranteed by the Export-Import Bank, 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.
r Revised.

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

Fiscal Years 1957–1992
(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:								
1957[d]–1974	1,108	92	$11,569	$ 615	400	237	$ 4,856	$1,334
1975	136	1	2,070	5	64	10	691	64
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[r]	—	2	—	73
1989	3	5	253	459	1	2	—	225
1990	—	6	—	264	—	2	—	225
1991	—	12	—	665[r]	—	3	—	567[r]
1992	—	37	—	1,889	—	12	—	1,597
1957–1992 Cumulative New Authorizations	1,846	319	$29,775	$10,780	654	390	$13,353	$8,975
Transfers, Reversals, & Participation	—	—	(8)	8	4	—	(140)	(20)
Cumulative Gross Authorizations (net of Adjustments)	1,846	319	$29,766	$10,772	658	390	$13,213	$8,955

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, including Direct Credits and loans authorized under the Cooperative Financing Facility (CFF) until the termination of the CFF program in 1981, but excluding Discount Loans, 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."

d First year of commercial jet aircraft authorizations.

Tr.Qtr. See Glossary.

r Revised.

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

Fiscal Years 1988–1992
(Values in Millions of Dollars)

Customer (Country/Airline)	Number and Aircraft Model or Related Product	Export Value	Authorization				
			Loans (Direct Credits)				Guarantees
			Amount	Percent Coverage[a]	Interest Rate	Repayment Terms[b]	Amount
FY 1992							
TOTALS	37 aircraft	$1,889	—	—	—	—	$1,597
Australia/Australian Airlines	5 x 737	153	—	—	—	—	131
Brazil/VARIG	2 x 737	60	—	—	—	—	42
China/China Eastern Airlines	2 x MD-11	221	—	—	—	—	186
Czechoslavakia/ Czechoslak Airline	5 x 737	144	—	—	—	—	123
India/Air India	4 x 747	704	—	—	—	—	600
Mexico/Banco Nac De Comercio Exterio	1 x 737	38	—	—	—	—	30
Morocco/RAM Leasing	4 x 737	134	—	—	—	—	114
Norway/Braathens S.A.F.E.	2 x 737	50	—	—	—	—	42
Pakistan/Pakistan Int'l Airline	1 x 737	35	—	—	—	—	30
Poland/Lot Polisa Airlines	9 x 737	289	—	—	—	—	246
Tunisia/Society Tunisienne De L'Air	2 x 737	62	—	—	—	—	53
FY 1991							
TOTALS	12 aircraft	$ 657	—	—	—	—	$ 566
Bahrain/Gulf Air Co.	6 x 767	427	—	—	—	—	366
Greece/Olympic Airways	6 x 737	230	—	—	—	—	200

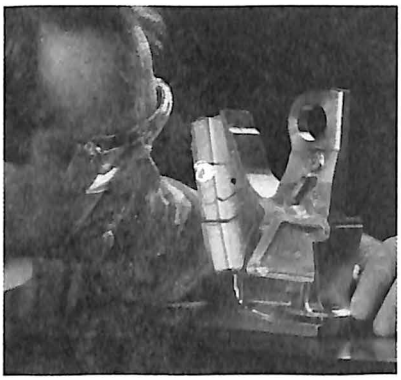
(Continued on next page)

EXPORT-IMPORT BANK LOAN AND GUARANTEE AUTHORIZATIONS
(Continued)

Customer (Country/Airline)	Number and Aircraft Model or Related Product	Export Value	Authorization				
			Loans (Direct Credits)				Guarantees
			Amount	Percent Coverage[a]	Interest Rate	Repayment Terms[b]	Amount
FY 1990							
TOTALS	6 aircraft	$264	—	—	—	—	$225
Columbia/Avianca	2 x 767	150	—	—	—	—	128
Morocco/Royal Air Maroc	4 x 737	114	—	—	—	—	97
FY 1989							
TOTALS	8 aircraft	$712	$158[r]	—	—	—	$605
Algeria/Algerie Air	3 x 737	253[r]	158	62.5	8.95%	24-S	215
Yugoslavia/Jugoslovenski Aerotransport	3 x MD-11	301	—	—	—	—	255
Zimbabwe/Government of	2 x 747	158	—	—	—	—	135
FY 1988							
TOTALS	2 aircraft	$ 94	—	—	—	—	$ 76
Bangladesh/Bangladesh Biman Corp.	1 x DC-10-30	67	—	—	—	—	50
Israel/El Al	1 x 757	27	—	—	—	—	22
Uganda/Uganda Airlines	707 Hushkit	3	—	—	—	—	3

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).
r Revised.

Employment



For the third consecutive year, employment in the aerospace industry declined. On an average annual employment basis, the aerospace labor force was reduced by 10 percent to a 1992 level of 1,098,000, which compares with 1,214,000 in the previous year and 1,314,000 in 1989 when employment peaked.

The job losses were caused principally by continuing reductions in defense appropriations and the resultant impact on the industry's defense business volume. However, an additional factor made its impact in 1992: the continuing financial problems of the world's airlines caused some carriers to cancel or postpone deliveries of transport aircraft already on order, forcing jetliner manufacturers to stretch out production schedules and thin out their labor forces.

This situation, wherein the industry's two main business segments are simultaneously depressed, is expected to continue at least until 1996, when a rebound in commercial aircraft orders is anticipated. The outlook is for further employment reductions; an AIA projection estimated that total industry employment would fall in 1993 below the one million level and that cumulative job losses for the period 1990-93 would approach 30 percent.

The 1992 aerospace employment figure represented six percent of the total employment in all U.S. manufacturing industries, down from 6.6 percent in the previous year. It also represented 10.6 percent of the total employed by U.S. companies producing durable goods; the 1991 figure was 11.5 percent.

The industry segment engaged in manufacture of aircraft, engines and parts once again suffered the greatest number of lost jobs. Annual average employment in that category was 611,000, down 58,000 from 1991's 669,000.

1993-94

Employment averaged 145,000 (down 23,000) in the industry segment producing missile and space systems. Average employment for all other categories fell from 378,000 in 1991 to 341,000 in 1992.

The total number of production workers declined by 11 percent, from 400,000 in 1991 to 356,000 in 1992. In aircraft, engine and parts manufacture, production workers numbered 291,000 in 1992, more than 80 percent of the total, but the lowest number employed since 1984.

The industry's payroll dropped to $33.2 billion, down 4.2 percent from 1991's $34.7 billion; both figures include lump-sum payments made by many aerospace companies in lieu of general wage or cost of living increases. Average weekly earnings (again including lump-sum payments) came to $694, up from $657 in 1991; average hourly earnings were $16.69, up from $15.71.

As usual, the Pacific region dominated in a geographic breakdown of employment. The Pacific region led with 39 percent (that figure, however, was down 1.5 percentage points from 1991). New England, at 11.4 percent, placed second and West North Central (10.6 percent) third in shares of the aerospace work force. Next, in order, were the South Central (9.1 percent), South Atlantic (8.4 percent), Middle Atlantic (7.9 percent), East North Central (7.4 percent) and Mountain (6.2 percent) regions. The Pacific region also led in most product group breakdowns. In civil aircraft manufacture, employment at Pacific region-based companies constituted 56.5 percent of the total. The East North Central (13.4 percent) and West North Central (11 percent) regions followed.

In military aircraft production, the Pacific region led with 23.6 percent of the work force, followed by New England (19.5 percent) and the South Central (15.2 percent) region. Regional breakdowns for missile manufacture were: New England/Middle Atlantic combined (35 percent); Pacific (33.7 percent); Mountain (11.5 percent). In space fabrication employment, the Pacific region had 59.1 percent of the total; the other leaders were the Mountain (14.6 percent) and South Atlantic (12.1 percent) regions.

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

Calendar Years 1979–1992
(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	18,781	11,014	1,038	5.5	9.4
1983	18,434	10,707	1,019	5.5	9.5
1984	19,378	11,479	1,058	5.5	9.2
1985	19,260	11,464	1,151[r]	6.0	10.0
1986	18,965	11,203	1,241[r]	6.5	11.1
1987	19,024	11,167	1,282[r]	6.7	11.5
1988	19,350	11,381	1,294	6.7	11.4
1989	19,442	11,420	1,314	6.8	11.5
1990	19,117[r]	11,130[r]	1,302[r]	6.8	11.7
1991	18,455[r]	10,602[r]	1,214[r]	6.6	11.5
1992	18,190	10,339	1,098	6.0	10.6

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[r]
AEROSPACE INDUSTRY AND ALL MANUFACTURING INDUSTRIES

Calendar Years 1979–1992
(Millions of Dollars)

Year	All Manufacturing Industries[a]	Aerospace Industry[b]			Aerospace As Percent of All Manufacturing
		TOTAL	Production Workers	Other Workers	
1979	$334,800	$15,150	$ 6,465	$ 8,685	4.5%
1980	355,600	18,026	7,658	10,368	5.1
1981	386,700	19,906	8,152	11,754	5.1
1982	384,000	20,750	8,043	12,707	5.4
1983	397,400	21,644	8,071	13,573	5.4
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	556,900	34,520	12,536	21,984	6.2
1992	565,700	33,089	11,790	21,300	5.8

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	33,231	11,932	21,300	5.9

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 1979–1992
(Annual Average, Thousands of Employees)

Year	TOTAL	Aircraft, Engines, & Parts (SIC 372)	Missiles & Space Vehicles (SIC 376)	Other[b]
TOTAL EMPLOYMENT				
1979	1,007	593	102	313
1980	1,080	633	111	336
1981	1,087	626[r]	123	338
1982	1,038	584	131	323
1983	1,019	562	141	317
1984	1,058	575	154	329
1985	1,151[r]	616	177	358
1986	1,241[r]	656	200	386
1987	1,282[r]	678	206	399
1988	1,294	684	208	402
1989	1,314	711	194	408[r]
1990	1,302[r]	712	185	405
1991[r]	1,214	669	168	378
1992	1,098	611	145	341
PRODUCTION WORKERS				
1979	378	322	33	24
1980	404	344	35	25
1981	395	333	37	25
1982	361	296	40	24
1983	343	274	46	24
1984	353	276	52	25
1985	384	295	62	27
1986	419	323	67	29
1987	435	339	67	30
1988	424	331[r]	63	30
1989	434	344	60	31
1990	432	345	57	30
1991	400[r]	324	48	28
1992	356	291	40	26

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 1979–1992
(Annual Average, Thousands of Employees)

Year	TOTAL (SIC 372)	Airframes (SIC 3721)	Engines and Parts (SIC 3724)	Other Parts & Equipment (SIC 3728)
TOTAL EMPLOYMENT				
1979	592.5	333.2	151.6	107.8
1980	633.1	349.3	162.9	120.9
1981	626.4[r]	344.2	162.5	119.8
1982	584.0	319.9	148.8	115.3
1983	561.6	304.7	140.1	116.9
1984	574.9[r]	306.1	140.2	128.7[r]
1985	616.2[r]	325.6	147.5	143.2[r]
1986	655.8[r]	338.9	153.6	163.2[r]
1987	678.0[r]	356.4	158.2	163.4[r]
1988	683.5[r]	368.5	155.8	159.3[r]
1989	711.0[r]	382.2	153.5	175.2[r]
1990	712.3[r]	381.0	151.7	179.5[r]
1991	669.2[r]	355.6[r]	143.2	170.3[r]
1992	611.3	332.0	127.1	152.2
PRODUCTION WORKERS				
1979	322.1	165.9	86.4	70.2
1980	343.9	173.7	93.0	77.4
1981	332.7[r]	167.0	92.4	73.5
1982	296.2	144.7	84.2	67.3[r]
1983	273.9[r]	131.5	74.7	67.1
1984	276.0	128.2	73.0	73.3[r]
1985	294.6	135.5	74.8	82.2[r]
1986	322.5	146.6	78.7	94.3[r]
1987	338.5[r]	159.1	80.5	96.3[r]
1988	331.3[r]	162.1	77.1	92.1[r]
1989	343.7[r]	167.4	76.8	99.5[r]
1990	344.6[r]	164.1	77.2	103.2[r]
1991	323.6[r]	151.6[r]	73.1	98.8[r]
1992	290.8	137.8	64.6	88.5

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

AEROSPACE INDUSTRY EMPLOYMENT[a] BY OCCUPATIONAL CLASSIFICATION

As of December[b] 1982–1993
(Thousands of Employees)

Year	TOTAL	Production Workers	Scientists & Engineers	Technicians	Others
1982	765	353	134	54	224
1983	765	344	135	55	231
1984	817	365	147	60	245
1985	898	405	163	66	264
1986	948	436	168	67	277
1987	968	436	175	69	288
1988	977	431	184	66	296
1989	992	439	198	68	287
1990	946	422	205	68	251
1991	879	386	205	60	228
1992[p]	783	340	187	54	202
1993[E]	702	NA	NA	NA	NA

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

a Totals for employment by occupational classification reflect only establishments in SICs 372, 376, 366, 381, and 382. As a result, they do not match the totals for aerospace employment by product group which include other industries with employment related to aerospace.

b End-of-year figures often differ from annual averages appearing in other tables.

E Estimate.

NA Not available.

p Preliminary.

GEOGRAPHIC DISTRIBUTION OF AEROSPACE EMPLOYMENT[a] BY OCCUPATIONAL CLASSIFICATION AND PRODUCT GROUP

As of December 1992

PERCENT DISTRIBUTION BY OCCUPATION

Region	TOTAL	Production Workers	Scientists & Engineers	Technicians	All Others
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
New England	11.4%	13.7%	8.3%	8.0%	12.1%
Middle Atlantic	7.9	6.1	12.3	3.0	7.5
East North Central	7.4	12.0	6.3	2.2	3.8
West North Central	10.6	13.8	7.7	10.8	9.0
South Atlantic	8.4	5.0	10.7	10.7	10.1
South Central	9.1	7.8	8.5	6.0	12.2
Mountain	6.2	5.1	7.2	5.9	6.7
Pacific	39.0	36.5	39.0	53.4	38.6

PERCENT DISTRIBUTION BY PRODUCT GROUP

Region	Total	Aircraft		Missiles	Space	Other	
		Civil	Military			Aero	Non-Aero
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New England	11.4%	3.2%	19.5%	35.0%	4.2%	8.3%	70.3%
Middle Atlantic	7.9	1.9	7.8			16.3	
East North Central	7.4	13.4	9.5	8.8	0.8	4.2	9.4
West North Central	10.6	11.0	13.3			13.3	
South Atlantic	8.4	7.6	10.1	8.8	12.1	14.7	9.4
South Central	9.1		15.2	2.2	9.2	6.7	
Mountain	6.2	6.4	1.0	11.5	14.6	6.1	10.9
Pacific	39.0	56.5	23.6	33.7	59.1	30.4	

Source: Aerospace Industries Association, company reports.
NOTE: Data for two regions are combined where employment for one region within a product group represented three or fewer companies.
a Employment in 37 surveyed aerospace manufacturing corporations accounted for approximately two-thirds of total industry employment.

TOTAL EMPLOYMENT AND SCIENTISTS & ENGINEERS IN COMMERCIAL TRANSPORT AIRCRAFT & HELICOPTER MANUFACTURING ESTABLISHMENTS[a]

As of December 1982–1992

Year	Commercial Transport Aircraft[r]		Helicopters	
	Total	Scientists & Engineers	Total	Scientists & Engineers
1982	61,800	10,200	26,500	3,100
1983	46,100	8,100	27,600	3,500
1984	54,800	8,900	31,300	3,800
1985	65,000	10,500	37,900	5,000
1986	75,300	12,500	37,400	4,000
1987	87,400	14,700	39,000	4,300
1988	98,800	16,200	36,600	4,200
1989	120,100	15,100	34,200	4,900
1990	122,400	16,700	30,600	4,500
1991	122,500	15,900	30,100	4,600
1992[p]	110,300	13,800	27,800	4,300

Source: Aerospace Industries Association, company reports and AIA estimates.

a Includes only establishments identified as prime manufacturers of commercial transport aircraft and of civil and military helicopters. Excludes subcontractors and propulsion manufacturers.

p Preliminary.

r Revised.

AVERAGE HOURLY EARNINGS IN THE AEROSPACE INDUSTRY

Production Workers Only
Calendar Years 1975–1992

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 HOURS							
1975	$ 6.00	$ 6.00	$ 6.21	$ 6.04	$ 5.47	$ 6.02	$ 5.99
1976	6.44	6.44	6.63	6.46	5.95	6.48	6.49
1977	6.93	6.92	7.07	7.05	6.44	7.04	7.15
1978	7.54	7.54	7.70	7.80	6.93	7.56	7.72
1979	8.26	8.26	8.50	8.53	7.48	8.25	8.38
1980	9.27	9.28	9.66	9.42	8.40	9.22	9.33
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[r]	15.60[r]	16.72	15.38	14.05[r]	14.90	15.21
1992	16.48	16.55	17.70	16.28	14.94	15.99	16.45
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[r]	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[r]	15.26
1991	15.71[r]	15.81[r]	17.16	15.38	14.05[r]	15.09	15.49
1992	16.69	16.77	18.18	16.28	14.94	16.06	16.56

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 1979–1992

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							
1979	$351	$351	$360	$361	$322	$347	$348
1980	389	390	404	394	358	378	383
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[r]	616	616	542	589	611
1990	624	626	656	637	570	612	634
1991	648	651	694	654	583[r]	632	649
1992	686	690	736	689	617	652	666
AVERAGE WEEKLY EARNINGS INCLUDING LUMP-SUM PAYMENTS[c]							
1984	$515[r]	$518[r]	$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[r]	712	654	583[r]	640	661
1992	694	699	756	689	617	655	671

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 1978–1992

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							
1978	42.2	42.2	42.1	41.7	43.1	41.9	40.9
1979	42.5	42.5	42.3	42.3	43.1	42.0	41.5
1980	41.9	42.0	41.8	41.8	42.6	41.0	41.1
1981	41.3	41.3	41.3	40.5	42.4	40.8	40.6
1982	41.1	41.1	40.9	40.7	41.9	40.8	41.1
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
AVERAGE WEEKLY OVERTIME HOURS							
1978	4.4	4.4	3.6	5.0	5.3	4.1	3.4
1979	4.7	4.7	4.1	5.1	5.3	4.4	3.8
1980	4.1	4.2	3.5	5.0	5.0	3.6	3.2
1981	3.5	3.5	3.1	3.5	4.4	3.2	2.9
1982	3.2	3.2	2.7	3.6	3.7	3.1	3.1
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	3.2

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

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

Calendar Years 1987–1991

	1987	1988	1989	1990	1991
All Manufacturing:					
Total Cases	11.9	13.0	13.1	13.2	12.7
Lost Workday Cases	5.3	5.7	5.8	5.8	5.6
Nonfatal Cases without Lost Workdays	6.7	7.3	7.3	7.3	7.1
Lost Workdays	95.5	107.3	113.0	120.7	121.5
Aircraft and Parts (SIC 372):					
Total Cases	8.3	9.9	10.1	10.4	10.9
Lost Workday Cases	3.1	3.6	3.7	4.0	4.3
Nonfatal Cases without Lost Workdays	5.2	6.3	6.4	6.4	6.6
Lost Workdays	55.7	67.9	70.2	90.3	114.4
Aircraft (SIC 3721):					
Total Cases	7.4	10.1	10.2	10.0	10.2
Lost Workday Cases	2.6	3.3	3.5	3.9	4.2
Nonfatal Cases without Lost Workdays	4.8	6.7	6.7	6.1	6.0
Lost Workdays	48.0	66.1	70.5	95.3	128.2
Aircraft Engines and Parts (SIC 3724):					
Total Cases	7.1	8.7	7.9	9.3	10.0
Lost Workday Cases	3.4	3.7	3.7	4.2	4.3
Nonfatal Cases without Lost Workdays	3.7	5.0	4.2	5.1	5.7
Lost Workdays	67.4	81.9	72.5	89.5	91.3
Aircraft Parts (SIC 3728):					
Total Cases	10.8	10.5	12.0	11.9	12.9
Lost Workday Cases	3.9	3.9	4.1	3.9	4.4
Nonfatal Cases without Lost Workdays	6.9	6.6	7.8	8.0	8.5
Lost Workdays	60.4	59.1	67.7	80.5	105.3
Guided Missiles, Space Vehicles & Parts (SIC 376):					
Total Cases	4.4	4.6	4.8	4.0	4.3
Lost Workday Cases	2.0	2.2	2.2	1.9	2.1
Nonfatal Cases without Lost Workdays	2.4	2.4	2.6	2.1	2.2
Lost Workdays	34.0	41.3	39.7	39.5	51.0
Guided Missiles & Space Vehicles (SIC 3761):					
Total Cases	4.3	4.6	4.6	4.0	4.3
Lost Workday Cases	2.2	2.3	2.2	1.9	2.2
Nonfatal Cases without Lost Workdays	2.2	2.3	2.5	2.1	2.1
Lost Workdays	37.4	44.6	41.4	37.3	54.2
Space Propulsion Units & Parts (SIC 3764):					
Total Cases	4.5	4.5	4.6	4.4	4.5
Lost Workday Cases	1.8	1.9	2.1	2.2	2.0
Nonfatal Cases without Lost Workdays	2.7	2.6	2.5	2.2	2.5
Lost Workdays	34.3	32.6	33.5	48.7	44.1
Other Space Vehicle Equipment (SIC 3769):					
Total Cases	4.2	NA	5.6	3.8	3.9
Lost Workday Cases	1.2	NA	2.3	1.6	1.6
Nonfatal Cases without Lost Workdays	3.0	NA	3.3	2.3	2.3
Lost Workdays	16.3	NA	41.5	38.4	40.8

Source: Bureau of Labor Statistics, "Occupational Injuries and Illnesses in the United States by Industry" (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.

FEDERAL CIVILIAN EMPLOYMENT[a] IN THE DEPARTMENT OF DEFENSE

Fiscal Years 1967–1994

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[r]	31,111[r]	978,081
1983	1,015,622[r]	30,816[r]	984,806
1984	1,040,213	28,681	1,011,532
1985	1,065,624[r]	28,754[r]	1,036,870
1986	1,069,863	28,511	1,041,352
1987	1,059,669[r]	28,352[r]	1,031,317
1988	1,053,000[r]	28,419[r]	1,024,581
1989	1,051,166[r]	28,081[r]	1,023,085
1990	1,048,814[r]	27,651[r]	1,021,163
1991[r]	1,001,183	27,385	973,798
1992	1,000,453	27,584	972,869
1993[E]	954,400	27,200	927,200
1994[E]	922,000	26,800	895,200

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.

r Revised.

EMPLOYMENT IN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION PROGRAMS

End of Fiscal Years 1961–1994

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[r]	22,430[r]	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[E]	228,703	24,203	204,500
1994[E]	236,833	23,833	213,000

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.

r Revised.

AEROSPACE INDUSTRY WORK STOPPAGES[a]

Calendar Years 1979–1992

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

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.

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

Calendar Years 1979–1992

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[r]
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	131,200	179,400
1988	708.6	136.4	19.2	137,000	185,900
1989	720.2	142.3	19.8	140,800[r]	189,400
1990	730.9	128.5	17.6	145,800[r]	205,900[r]
1991	704.1[r]	117.9[r]	16.7	147,400	185,900
1992	683.7	115.4	16.9	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.
r Revised.

Finance

The aerospace industry reported a heavy loss in 1992 but it was a technical loss resulting from an accounting change rather than an operational loss due to declining business volume. The change was one in which many aerospace companies elected to write off against earnings large amounts necessary to comply with Financial Accounting Standards Board (FASB) 106, a new standard for accounting for employees' future post-retirement benefits. The amounts set aside were charged to non-operating expense and for the industry as a whole they totaled $8.7 billion in 1992; they are reflected in the balance sheet as an increase in liabilities at the expense of stockholder's equity.

Thus, FASB 106 compliance reduced the industry's $6.9 billion operating profit to a net loss after taxes of $1.8 billion. The latter figure is not directly comparable to prior year figures. The most valid comparison is the operating profit of $6.9 billion on sales of $134.4 billion in 1992, which compares with $7.6 billion on 1991 sales of $135.2 billion. The decline in total sales was the first since the early 1970's.

Expressed as a percentage of sales, the industry's profit amounted to a negative 1.4 percent, compared with a positive one percent average for all U.S. manufacturing industries. As a percentage of assets, the aerospace figure was a negative 1.2 percent; all manufacturing experienced a positive one percent profit. As a percentage of equity, it was negative 5.2 percent for aerospace and a positive 2.6 percent for all manufacturing.

At $4.4 billion, the industry's 1992 outlays for new plant and equipment were up substantially from 1991's $4.1 billion. However, for 1993 the Bureau of the Census estimated a drop to $3.3 billion.

The aerospace balance sheet, as reported by the Bureau of the Census showed an increase in net working capital, from $14.5 billion in 1991 to $15.2 billion in 1992. Total assets, however, declined from $130.9 billion in 1991 to $127.8 billion in 1992.

1993-94 McDonnell Douglas Corporation once again topped the list of Department of Defense contractors in terms of contract dollar value in Fiscal

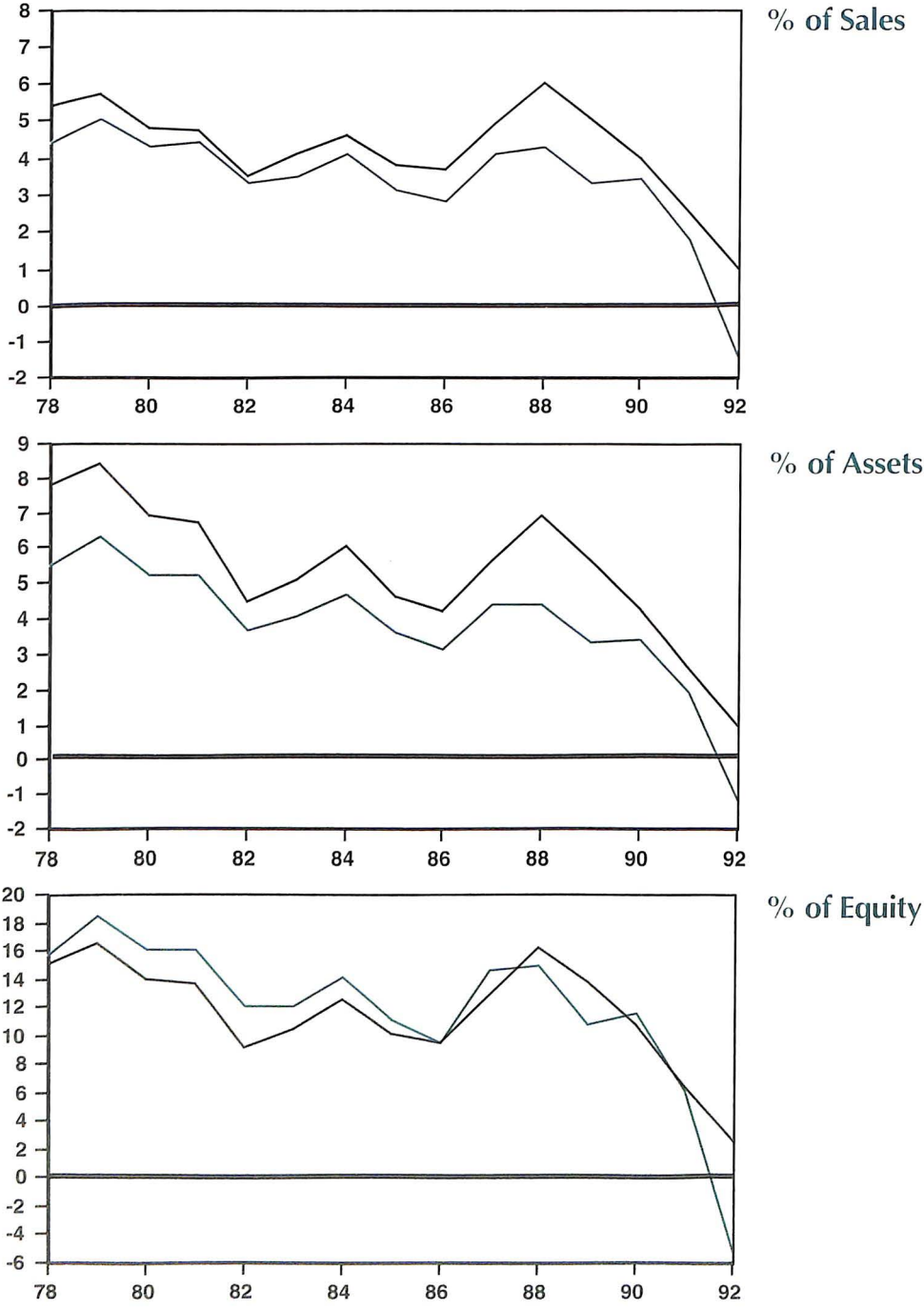
Year 1992 with awards totaling $5.3 billion (which compares with $8.1 billion in FY 1991). In second place was Northrop Corporation with $4.9 billion, followed by Lockheed Corporation ($4.7 billion), General Dynamics Corporation ($4.5 billion) and General Electric Company ($4 billion). Northrop climbed from sixth place in 1991 to second, Lockheed moved up from ninth to third. McDonnell Douglas, General Dynamics and General Electric ranked first, second and third in DoD contract awards in 1991.

Rounding out the top 10 contractors were General Motors Corporation ($3.7 billion), Raytheon Company ($2.8 billion), United Technologies Corporation ($2.8 billion), The Boeing Company ($2.5 billion) and Martin Marietta Corporation ($2.4 billion).

Rockwell International Corporation, perennial leader among NASA contractors, once again headed the list in FY 1992 with contracts worth $1.4 billion. McDonnell Douglas Corporation was second with $1 billion, followed by Lockheed Space Operations Company ($600 million), Lockheed Missiles & Space Company ($530 million), and Thiokol Corporation ($510 million).

The rest of NASA's top 10 contractors included: The Boeing Company ($500 million), Martin Marietta Corporation ($445 million), Rockwell Space Operations, Inc. ($346 million), General Electric Company ($299 million) and Lockheed Engineering and Science Company ($270 million). The same 10 companies were the top 10 in 1991.

Net Profit After Taxes



Source: Aerospace Industries Association

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

Calendar Years 1978–1992

PERCENT OF SALES

Year	All Manufacturing Corporations	Non-Durable Goods	Durable Goods	Aerospace Industry
1978	5.4%	5.4%	5.5%	4.4%
1979	5.7	6.1	5.2	5.0
1980	4.8	5.6	4.0	4.3
1981	4.7	5.1	4.3	4.4
1982	3.5	4.6	2.4	3.3
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
1992	1.0	3.2	(1.4)	(1.4)

PERCENT OF ASSETS[b] AND EQUITY[b]

Year	Percent of Assets		Percent of Equity	
	All Manufacturing	Aerospace Industry	All Manufacturing	Aerospace Industry
1978	7.8%	5.5%	15.0%	15.7%
1979	8.4	6.3	16.5	18.4
1980	6.9	5.2	13.9	16.0
1981	6.7	5.2	13.6	16.0
1982	4.5	3.7	9.2	12.0
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	6.4	6.1
1992	1.0	(1.2)	2.6	(5.2)

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 as their principal activity the manufacture of aircraft, guided missiles, space vehicles, their propulsion, and parts.

b Average of four quarters.

( ) Net loss after taxes.

INCOME STATEMENT AND OPERATING RATIOS FOR AEROSPACE COMPANIES[a]

Calendar Years 1989–1992
(Millions of Dollars)

INCOME STATEMENT	1989	1990	1991	1992
Net Sales, Receipts, Operating Revenues	$118,297	$133,618	$135,175	$134,420
Less: Depreciation, Depletion, & Amortization of Property, Plant, and Equipment	4,014	4,250	4,353	4,443
Less: All Other Operating Costs & Expenses, Including Selling Costs & General & Administrative Expenses	108,824	122,678	123,208	123,075
Income (or Loss) from Operations	$ 5,460	$ 6,692	$ 7,614	$ 6,900
Net Non-Operating Income (Expense)	(20)	(544)	(3,432)	(8,666)
Income (or Loss) Before Income Taxes (= Total Income)	$ 5,439	$ 6,147	$ 4,181	$ (1,766)
Less: Provision for Current & Deferred Domestic Income Taxes	1,574	1,660	1,698	71
Income (or Loss) after Income Taxes (= Net Profit)	$ 3,866	$ 4,487	$ 2,484	$ (1,836)
Cash Dividends Charged to Retained Earnings	1,806	1,823	1,678	1,610
Net Income Retained in Business	$ 2,060	$ 2,665	$ 806	$ (3,449)
Retained Earnings at Beginning of Year[b]	27,508	28,227	30,694	30,647
Adjustments to Retained Earnings[c]	(931)	(350)	(707)	(1,673)
Retained Earnings at End of Year[d]	$ 28,637	$ 30,541	$ 30,793	$ 25,528
OPERATING RATIOS				
Income before Taxes as Percent of Net Sales	4.6%	4.6%	3.1%	(1.3)%
Provision for Current & Deferred Domestic Income Taxes as Percent of Income before Taxes (Total Income)	28.9	27.0	40.6	(0.4)
Income after Taxes (Net Profit) as Percent of Net Sales	3.3	3.4	1.8	(1.4)
Income after Taxes (Net Profit) as Percent of Stockholders' Equity[e]	10.7	11.5	6.1	(5.2)
Income after Taxes (Net Profit) as Percent of Total Assets[e]	3.3	3.4	1.9	(1.2)

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, 1989–1992
(Millions of Dollars)

	1989	1990	1991	1992
Assets:				
Current Assets:				
Cash	$ 1,480	$ 2,172	$ 2,950	$ 3,963
Securities, Commercial Paper, & Other Short-term Financial Investments	1,785	2,920	3,468	3,269
Total Cash and U.S. Government and Other Securities	$ 3,264	$ 5,092	$ 6,418	$ 7,233
Receivables (Total)	18,732	19,620	17,812	15,762
Inventories (Gross)	49,944	50,423	49,973	44,010
Other Current Assets	2,391	2,327	2,166	3,930
Total Current Assets	$ 74,332	$ 77,463	$ 76,370	$ 70,934
Net Plant, Property, & Equipment	24,506	26,161	26,557	27,483
Other Non-Current Assets	23,053	28,199	28,012	29,354
Total Assets	$121,892	$131,823	$130,939	$127,770
Liabilities:				
Current Liabilities:				
Short Term Loans	$ 3,799	$ 2,677	$ 1,943	$ 1,735
Trade Accounts & Notes Payable	10,898	12,445	12,188	11,290
Income Taxes Accrued	1,925	2,002	1,151	1,288
Installments Due on Long Term Debts	1,269	1,392	1,767	2,264
Other Current Liabilities	43,813	44,690	44,823	39,175
Total Current Liabilities	$ 61,704	$ 63,205	$ 61,871	$ 55,752
Long Term Debt	16,191	20,979	20,682	19,241
Other Non-Current Liabilities	7,081	7,741	8,123	18,318
Total Liabilities	$ 84,976	$ 91,926	$ 90,676	$ 93,310
Stockholders' Equity:				
Capital Stock	$ 8,661	$ 9,510	$ 9,681	$ 8,037
Retained Earnings	28,255	30,386	30,581	26,424
Total Stockholders' Equity	$ 36,916	$ 39,896	$ 40,262	$ 34,460
Total Liabilities & Stockholders' Equity	$121,892	$131,823	$130,939	$127,770
Net Working Capital	$ 12,628	$ 14,257	$ 14,499	$ 15,183

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.

NEW PLANT AND EQUIPMENT EXPENDITURES

Calendar Years 1964–1993
(Billions of Dollars)

Year	All Industries	All Manufacturing Industries	Durable Goods	Aerospace[a]	
				Current Dollars	Constant Dollars[b] (1982=100)
1964	$ 51.26	$ 21.23	$10.98	$0.41	$1.23
1965	59.52	25.41	13.49	0.53	1.57
1966	70.40	31.37	17.23	1.17	3.38
1967	72.75	32.25	17.83	1.25	3.49
1968	76.42	32.34	17.93	1.23	3.32
1969	85.74	36.27	19.97	1.29	3.37
1970	91.91	36.99	19.80	0.88	2.19
1971	92.91	33.60	16.78	0.63	1.51
1972	103.40	35.42	18.22	0.68	1.59
1973	120.03	42.35	22.63	0.79	1.79
1974	139.67	52.48	26.77	1.21	2.40
1975	142.42	53.66	25.37	1.19	2.04
1976	158.44	58.53	27.50	1.02	1.64
1977	184.82	67.48	32.77	1.14	1.72
1978	216.81	78.13	39.02	1.77	2.48
1979	255.26	95.13	47.72	2.71	3.50
1980	286.40	112.60	54.82	3.60	4.20
1981	324.73	126.68	58.93	3.40	3.59
1982	326.19	123.97	54.58	3.45	3.45
1983	321.16	117.35	51.61	2.95	2.87
1984	373.83	139.61	64.57	3.63	3.45
1985	410.12	152.88	70.87	3.51	3.27
1986	399.36	137.95	65.68	3.86	3.52
1987	410.52	141.06	68.03	3.60	3.22
1988	455.49	163.45	77.04	3.49	3.05
1989	507.40	183.80	82.56	4.17	3.51
1990	532.61	192.61	82.58	4.02	3.27
1991[r]	528.39	182.81	77.64	4.05	3.20
1992	546.08	173.90	73.41	4.39	3.40
1993[E]	581.12	178.23	77.49	3.29	NA

Source: Bureau of the Census, "Plant and Equipment Expenditures and Plans" (Quarterly).
a Data are company-based (not establishment nor product-based) and represent corporate entities whose principal activity falls in SIC codes 372 and 376.
b Based on the Producer Price Index, Capital Equipment.
E Estimate.
NA Not Available.
r Revised.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MAJOR CONTRACTORS

Fiscal Years 1989–1992
By rank according to net value of NASA prime contracts awarded during last fiscal year
(Millions of Dollars)

Company	1989	1990	1991	1992
TOTAL PROCUREMENTS	$10,876	$12,565	$13,159	$13,478
Awards to Business Firms	8,568	10,072	10,417	10,717
% of TOTAL PROCUREMENTS	79%	80%	79%	79%
Rockwell International Corp.	$ 1,692	$ 1,747	$ 1,560	$ 1,449
McDonnell Douglas Corp.	506	851	1,089	1,045
Lockheed Space Operations Co.	553	583	591	599
Lockheed Missiles & Space Co.	145	294	458	530
Thiokol Corp.	420	498	438	510
The Boeing Co.	236	399	468	500
Martin Marietta Corp.	355	507	572	445
Rockwell Space Operations Inc.	287	309	343	346
General Electric Co.	300	402	308	299
Lockheed Engrg. & Science Co.	217	234	259	270
Computer Sciences Corp.	192	183	207	232
EG&G Florida Inc.	187	191	227	213
USBI Booster Production Co.	196	233	198	207
TRW Inc.	193	241	192	194
Bendix Field Engineering	156	156	176	181
Loral Aerospace Co.[b]	196	174	186	141
Boeing Computer Support Services.	158	165	159	140
United Technologies Corp.	133	136	133	136
Sverdrup Technology Inc.	65	79	97	109
Grumman Aerospace Corp.	80	86	100	103
Space Systems Loral, Inc.	(a)	(a)	(a)	95
Johnson Controls World Serv. Inc.	(a)	(a)	70	76
IBM Corp.	102	102	68	76
CAE Link Corp.	16	53	45	61
Harris Space Systems Corp.	(a)	25	45	60
BAMSI Inc.	30	38	52	59
Orbital Sciences Corp.	35	35	36	56
Teledyne Industries Inc.	52	73	65	54
GTE Gov't Systems Corp.	(a)	(a)	(a)	50
Ball Corp.	21	19	22	49

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 as Ford Aerospace Corporation.

DEPARTMENT OF DEFENSE MAJOR CONTRACTORS

Fiscal Years 1988–1992
Listed by rank according to net value of prime contracts awarded during last fiscal year
(Millions of Dollars)

Company	1988	1989	1990	1991	1992
TOTAL CONTRACTS	$137,049	$128,958	$130,758	$136,640	$121,438
McDonnell Douglas Corp.	$ 8,003	$ 8,617	$ 8,211	$ 8,057	$ 5,311
Northrop Corp.	533	631	746	3,319	4,851
Lockheed Corp.	3,538	3,652	3,553	2,667	4,650
General Dynamics Corp.	6,522	6,899	6,306	7,848	4,464
General Electric Co.	5,701	5,771	5,589	4,866	4,008
General Motors Corp.	3,550	3,692	4,107	4,427	3,694
Raytheon Co.	4,055	3,761	4,071	4,090	2,841
United Technologies Corp.	3,508	3,556	2,856	2,825	2,803
The Boeing Co.	3,018	2,868	2,267	1,166	2,495
Martin Marietta Corp.	3,715	3,337	3,492	2,689	2,356
Litton Industries Inc.	2,561	1,437	1,576	1,601	2,334
Grumman Corp.	2,848	2,373	2,697	2,363	2,183
Loral Corp.	494	451	618	1,283	1,815
AT&T Co.	791	754	769	699	1,338
Rockwell International Corp.	2,184	2,133	2,217	1,708	1,233
Textron Inc.	1,276	908	1,190	997	1,161
Bath Holding Corp.	(a)	218	734	872	1,148
Westinghouse Electric Corp.	2,185	1,650	2,243	1,812	1,147
TRW Inc.	1,250	1,294	1,087	1,092	1,013
IBM Corp.	1,065	1,309	1,286	773	932
Unisys Corp.	1,380	1,245	1,376	1,379	834
ITT Corp.	769	1,163	870	948	797
Foundation Health Corp.	(a)	639	515	433	761
Texas Instruments Inc.	1,232	946	704	982	731
GTE Corp.	423	2,342	1,294	801	724
Science Application Int'l Corp.	344	415	510	513	686
Alliant Techsystems Inc.	(a)	(a)	(a)	827	610
Tenneco Inc.	5,058	916	2,410	363	585
Olin Corp.	331	439	576	616	573
E-Systems Inc.	263	284	460	603	501

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).

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

By Geographic Region
Fiscal Years 1990, 1991, and 1992

Program and Region	Millions of Dollars			Percent of Program Total		
	1990	1991	1992	1990	1991	1992
AIRCRAFT—TOTAL	$27,107	$26,227	$26,440	100.0%	100.0%	100.0%
New England	3,098	3,206	2,981	11.4	12.2	11.3
Middle Atlantic	3,226	2,442	2,859	11.9	9.3	10.8
East North Central	2,648	1,877	1,538	9.8	7.2	5.8
West North Central	5,227	4,513	2,811	19.3	17.2	10.6
South Atlantic	2,344	2,504	4,394	8.6	9.5	16.6
East South Central	324	379	407	1.2	1.4	1.5
West South Central	3,909	4,515	3,205	14.4	17.2	12.1
Mountain	1,909	730	474	7.0	2.8	1.8
Pacific[a]	4,423	6,062	7,772	16.3	23.1	29.4
MISSILE & SPACE SYSTEMS—TOTAL	$18,630	$17,990	$14,468	100.0%	100.0%	100.0%
New England	2,220	2,516	1,715	11.9	14.0	11.9
Middle Atlantic	1,252	1,489	1,088	6.7	8.3	7.5
East North Central	57	140	81	0.3	0.8	0.6
West North Central	521	1,169	445	2.8	6.5	3.1
South Atlantic	1,707	1,243	1,370	9.2	6.9	9.5
East South Central	658	748	848	3.5	4.2	5.9
West South Central	1,470	1,632	1,268	7.9	9.1	8.8
Mountain	3,459	3,077	2,241	18.6	17.1	15.5
Pacific[a]	7,285	5,977	5,411	39.1	33.2	37.4
ELECTRONICS & COMMUNICATIONS EQUIPMENT—TOTAL	$19,876	$17,470	$15,777	100.0%	100.0%	100.0%
New England	3,053	1,680	1,435	15.4	9.6	9.1
Middle Atlantic	3,270	3,444	2,707	16.5	19.7	17.2
East North Central	1,002	1,292	1,143	5.0	7.4	7.2
West North Central	901	800	874	4.5	4.6	5.5
South Atlantic	5,110	4,595	4,061	25.7	26.3	25.7
East South Central	221	210	175	1.1	1.2	1.1
West South Central	989	1,013	848	5.0	5.8	5.4
Mountain	866	485	565	4.4	2.8	3.6
Pacific[a]	4,464	3,951	3,969	22.5	22.6	25.2

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.

Glossary

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

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

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 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) and instruments (SICs 381 and 382) industries and in certain other industries (SICs 28, 35, 73, 89, etc.).

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; FMS and commercial exports of military aircraft, missiles, propulsion, and related parts; and sales of related products and services including: electronics, software, and ground support equipment; plus sales of non-aerospace products which are produced in aerospace-manufacturing establishments and which use technology, processes, and materials derived from the aerospace industry. See also *Related Products and Services.*

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 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 in 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 the Census an agency of the Department of Commerce.

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

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

Constant Dollars see *Deflator.*

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. Constant dollars are calculated by dividing current ("then-year") dollars by appropriate price deflator, and multiplying by 100.

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 *R&D.*

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 and late shift work and changes in output of workers paid for an incentive plan. *Average Weekly Earnings* derived by multiplying average weekly hours by 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.*

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.

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.

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.*

General Agreement on Tariffs and Trade (GATT) a multilateral treaty, subscribed to by 98 governments which together account

for more than four-fifths of world trade; its aim is to liberalize world trade; the only multilateral instrument that lays down agreed rules for international trade.

General Aviation all civil flying except that of air carriers.

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

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 net sales (see *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. In September 1986, in Punta del Este, Uruguay, over 100 nations launched a new round of multilateral trade negotiations, called the "Uruguay Round." The purpose of the "Uruguay Round" is 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), and 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, 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 record keeping and services closely associated with the above production operations.

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. *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. *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. *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.

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 *R&D*.

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 Socialists 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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AIA Member Companies

Aerojet, A Segment of GenCorp
AlliedSignal Aerospace
Aluminum Company of America
American Pacific Corporation
Argo-Tech Corporation
ASTECH/MCI Manufacturing, Inc.
B.H. Aircraft Company, Inc.
The Boeing Company
Chrysler Technologies Corporation
Coltec Industries Inc.
  Chandler Evans
  Menasco Aerosystems
  Walbar
Computing Devices International
CTA INCORPORATED
Digital Equipment Corporation
Dowty Aerospace Los Angeles
DuPont Company
Dynamic Engineering Incorporated
E-Systems, Inc.
FMC Corporation
GEC-Marconi Electronic Systems Corporation
General Dynamics Corporation
General Electric Company
General Motors Corporation
  General Motors Hughes Electronics
    Delco Electronics
    Hughes Aircraft Company
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The BFGoodrich Company
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Grumman Corporation
Gulfstream Aerospace Corporation
Harris Corporation
Heath Tecna Aerospace Company
HEICO Aerospace Corporation
Hercules Incorporated
Hexcel Corporation
Honeywell Inc.
ITT Defense and Electronics Inc.
Kaman Aerospace Corporation
Lockheed Corporation
Loral Vought Systems Corporation
Lord Corporation
Lucas Aerospace Inc.
Martin Marietta Corporation
McDonnell Douglas Corporation
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    Pratt & Whitney
    Sikorsky
    Hamilton Standard
    Norden
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Westinghouse Electric Corporation
  Electronic Systems Group
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