

AEROSPACE

Facts & Figures • 56th edition

2008

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FOREWORD

On Jan. 7, 1919, 100 leaders in the nascent aviation industry gathered at the Waldorf-Astoria Hotel in New York for a banquet dubbed “The Future of Aviation.” The group included Orville Wright (Wilbur had passed away seven years earlier) and Glen Curtiss, among many other early aviation innovators. They chartered a new organization called the Aeronautical Chamber of Commerce to “foster, advance, promulgate and promote aeronautics,” with the goal of doing everything possible to boost aviation.



That group would later become the Aerospace Industries Association, and we are proud to mark our 90th anniversary in 2009. We are the nation’s premier trade association representing major aerospace manufacturers. AIA has expanded beyond the original civil aviation mandate to include defense and space manufacturing. Our membership rolls include about 300 companies, consisting of large systems integrators and several tiers of suppliers.

Each year we present *Aerospace Facts & Figures* as a statistical accounting of our industry’s performance. AIA’s Aerospace Research Center collects statistics and other industry information from numerous sources, resulting in the resources found within this publication.

We find ourselves in extraordinary economic circumstances as we complete the 2008 issue of *Facts & Figures*. A worrisome financial climate has taken deep root in the United States and spread around the world. Few industries have escaped the impacts of the recession, and troubling news on jobs and financial markets continued through the end of the year.

While the aerospace industry is not immune to these negative circumstances, we are in a relatively good position to ride out the economic storm.

Preliminary results show that industry sales will reach \$204 billion in 2008. This figure represents modest growth for the year—an increase of 2.1 percent—especially compared to the high-flying last few years. Even so, it is a new record for the fifth consecutive year.

The industry also continued to show strength in exports, logging an expected total of \$99 billion for 2008. This fueled a positive foreign trade balance of \$61 billion, the largest of any U.S. manufacturing sector.

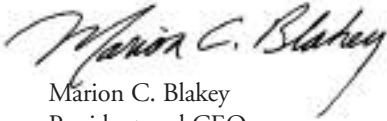
The outlook for 2009 remains positive in spite of serious economic challenges. Sales are forecast to total \$214 billion. Once again, this represents more modest growth than we have had in recent years.

The aerospace industry faces several challenges, including the uncertain futures of some defense programs, and the rocky commercial air transportation market.

Despite the slowing numbers, the U.S. aerospace industry continues to provide great benefits to our economy. It is responsible for more than 2 million quality jobs and draws from more than 30,000 suppliers in all 50 states. The industry helps keep our nation secure, creates advanced technology innovation, and enables air travel and space exploration.

This is a time of great challenge and change for our nation, with a new administration and Congress taking office. The U.S. aerospace industry stands ready to play a leading role in our nation's economic recovery, as we have during previous periods of economic challenge.

In addition to the information included here, AIA regularly releases updated statistical data. For more aerospace industry information and other useful resources, visit us online at aia-aerospace.org.

A handwritten signature in black ink, reading "Marion C. Blakey". The signature is fluid and cursive, with the first name "Marion" being the most prominent part.

Marion C. Blakey
President and CEO

AEROSPACE SUMMARY



STS-118 Launch (NASA Photo)

For the fourth consecutive year, U.S. aerospace sales set a record in 2007, with virtually all industry sectors posting gains. Also relevant for the year was the continued growth of both commercial sales and sales to the Department of Defense (DoD). In the past, the two market sectors have usually moved in somewhat opposite directions. However, both continued to rise in 2007, illustrating the strength of the overall aerospace industry. Within the two sectors shipments, orders, backlog, earnings, and employment all increased.

Despite news from the broader economy that might imply that the aerospace industry is ready to

reverse course, preliminary indications are that growth will continue into 2008, albeit at a more modest rate. The aerospace industry enjoys a few key advantages, such as strong defense spending and a high level of global competitiveness, allowing it to remain somewhat protected from the challenging times expected ahead.

Highlights of 2007 include:

SALES

Total sales for the aerospace industry grew by 7.2 percent to \$200.3 billion in 2007. By major customer groups, the DoD was again the largest single buyer of aerospace-related products, accounting for \$87.6 billion, or nearly 44 percent of total sales.

Non-government customers, namely civil airlines, were primarily responsible for the industry's growth in 2007. Such sales amounted to \$81.3 billion, up by 9.4 percent from 2006. While the *related products and services* sector achieved a much higher 32-percent improvement in sales, the sector's relatively smaller size (\$21.5 billion in 2007) lessened its impact on total sales.

Among the major product groups, sales of aircraft predominated. Overall, aircraft represented 67 percent of total aerospace sales. Aircraft sales, including both military and civil, totaled \$134.4 billion in 2007, an

increase of more than 6 percent. Within aircraft sales, civil sales continued to outpace military sales, accounting for nearly 60 percent of the total.

Of particular note is the continued success of the civil aircraft sector, which in recent years has benefitted from robust foreign sales. In 2007, strong international demand for U.S. aerospace products helped to raise the industry's net trade surplus 10.6 percent over the previous year. As it has been for many years, the aerospace industry was again a major contributor to the nation's trade balance.

The U.S. defense budget will likely be the most important driver behind aerospace sales growth over the next few years. Since fiscal 2003, the baseline, or planned, budget has been greatly boosted by supplemental spending. These funds, provided by Congress for warfighting needs, allow additional equipment purchases under the *Procurement* account and additional spares and maintenance services under the *Operations & Maintenance* account. Due largely to supplemental spending packages, U.S. weapons procurement grew from \$54 billion in fiscal 2001 to \$146 billion in fiscal 2008.

For 2007, aerospace industry sales represented 1.5 percent of the U.S. gross domestic product, up from 1.4 percent in 2006, and 3.9 percent of total sales by all U.S. manufacturing industries, up from 3.7 percent.

EARNINGS

As reported by the Bureau of the Census, the U.S. aerospace industry recorded a net profit of \$18.7 billion on \$230 billion of corporate sales in 2007. Aerospace sales and profits have increased sharply in recent years, driven by strong demand for both civil and military aircraft.

The aerospace industry's profit as a percentage of sales also increased considerably in 2007. The ratio increased from 6.7 percent to 8.2 percent, surpassing the industry average for all manufacturing corporations for the first time since 2002. The aerospace industry's return on assets matched that of the overall manufacturing sector at 6.7 percent after lagging for four years. Return on equity also increased appreciably, to 24.5 percent.

CIVIL AIRCRAFT SHIPMENTS

The civil aircraft market extended its recent gains into 2007, with shipments improving more than 6 percent to 4,729 aircraft. General aviation shipments were responsible for much of this increase, as production jumped 4.2 percent to 3,279 aircraft, valued at more than \$11.9 billion.

Helicopter shipments also increased dramatically—from 898 to 1,009—spurred by remarkably strong foreign demand. In total, civil aircraft sales rose over 10 percent in 2007, to \$80.2 billion. Topping the year off, the civil market achieved an almost unheard of book-to-bill ratio of three to one (i.e.,



Pratt and Whitney PW4000 Engine (Pratt and Whitney Photo)

three orders for each delivery). Looking forward, civil shipments will likely see only modest improvement in 2008 due to the Boeing work-stoppage and a slowing economy.

As has been the trend, civil transport aircraft predominated the overall civil aircraft sector by value in 2007. With 441 shipments, the value of large commercial

transport shipments reached \$29.2 billion, accounting for nearly 70 percent of complete civil aircraft sales.

MILITARY AIRCRAFT SHIPMENTS

Including aircraft, engines, parts, and services, AIA determined that military aircraft sales were virtually flat in 2007, finishing up the year at \$54.2 billion. Although aircraft acceptances by U.S. military agencies were up by over 7 percent, military exports dropped sharply in 2007, particularly fighters and helicopters. Even so, a careful examination of the numbers reveals that the drop is more a result of 2006's extraordinary record, rather than lackluster performance in 2007. Exports of fighters increased nearly 70 percent in 2006, and in 2007 returned to a still very healthy level more in line with historical norms.

Reflecting the moderate growth of the overall sector were the equally slight (less than 1 percent) increases in 2007 in military aircraft research and development (R&D), aftermarket labor and materials, and unmanned aerial vehicle (UAV) production and support.

AIA expects that military aircraft shipments will increase moderately in 2008, as growth is likely to be limited by waning support for programs such as the combat, search and rescue (CSAR) helicopter, and by continuing difficulties with programs such as the KC-X tanker. Foreign demand for fighter aircraft is also expected to decline.

Further, the new administration is expected to reduce defense spending, although the severity of potential cuts remains to be seen. However, cuts of any measure would not be felt immediately due to the considerable lag-time between the funding of aircraft programs and actual shipment.

SPACE PROGRAMS

Sales of space-related aerospace products and services moved counter to the aerospace industry's overall trend in 2007, dropping nearly 3 percent to

\$32 billion. Reasons include slight decreases in DoD space procurement and R&D. Extending a moderately downward slide, space accounted for 16 percent of total aerospace sales in 2007. NASA funding fared slightly better; although procurement was down for the year, R&D more than covered the loss, resulting in a moderate net positive result.

Looking forward, AIA expects stronger growth in both the commercial satellite and launch services sectors in 2008. This growth, together with moderate increases in budget authority for space programs under NASA and the DoD, will likely push overall space sales higher in 2008.

MISSILE PROGRAMS

In 2007, missile-related sales improved to \$12.4 billion, up by nearly 10 percent. Ballistic missile defense continued to dominate missile research, development, test, and evaluation (RDT&E), and accounted for approximately \$9.4 billion of the overall missile sector in 2007. As missile stocks are drawn down for both new deployments and for the continuing conflicts in Iraq and Afghanistan, sales in 2008 will likely increase to over \$13 billion.

SHIPMENTS, ORDERS, AND BACKLOG

In 2007, aerospace shipments, orders, and backlog all improved in dramatic fashion. Orders soared 27 percent to \$271.2 billion, while shipments reached a new high of \$184.3 billion. This boosted the backlog of orders to \$367.7 billion, a 31-percent increase that extended its advance into record territory.



MH-60 Seahawk (U.S. Navy Photo)



B-737 Jetliner (Boeing Photo)

The backlog's unprecedented growth in recent years has been driven primarily by a sharp increase in orders for commercial jetliners. Orders for civil aircraft shot up by more than 44 percent in 2007, reaching \$184.5 billion. Orders for defense aircraft and parts increased by a healthy 7 percent to \$40.9 billion.

Deteriorating economic conditions in the United States and abroad will likely cause mixed results in 2008. Total shipments are projected to increase to an estimated \$196.9 billion, but orders are expected to retreat from 2007's historic levels. If orders dip, the aerospace backlog, in turn, is likely to drop. Orders face risks from factors such as declining passenger traffic and aircraft financing difficulties. While cancellations are rare, delivery deferrals are relatively common. The experience of past downturns shows that delivery numbers can fall fast, even with a seemingly robust backlog in place.

It is also relevant to note that the Boeing work-stoppage contributed to the backlog's record high in 2007, pushing it higher than it might have reached had production not been interrupted.

FOREIGN TRADE

Foreign sales continue to account for a growing share of aerospace sales. The industry's backlog at year-end 2007 included 3,427 commercial transport aircraft, of which foreign customers held orders for 2,581. By value, international orders amounted to more than three-quarters of the backlog, up from just over half in 2004.

Exports: For the fourth straight year, foreign sales of U.S. aerospace products increased in 2007, totaling \$97.2 billion and up 14 percent from 2006. Civil transport aircraft exports accounted for more than 40 percent of total aerospace exports. General aviation aircraft exports also extended their uptrend in 2007, increasing by 17 percent to \$3.9 billion, a new record. Military aircraft exports retreated to \$4.2 billion from a record-high in 2006. While the Boeing work-stoppage may slow aerospace exports in 2008, AIA still expects some improvement in this account.

Imports: As with exports, U.S. imports of aerospace products increased again in 2007, reaching \$36.6 billion, a gain of more than 20 percent. One-third of the increase was accounted for by imports of commercial transport aircraft, particularly regional jets equipped with engines and

avionics that were originally manufactured in the United States and exported abroad.

Trade Balance: In 2007, the aerospace industry's trade balance reached a record \$60.6 billion, the largest surplus of any U.S. manufacturing industry. The surplus nearly doubled from 2004 to 2007, illustrating the growing international demand for U.S. aerospace products as well as the globalization of the aerospace industry. The aerospace surplus continues to benefit the overall U.S. economy as it offsets the overall manufacturing industry's chronic trade deficit. In 2007, international aerospace trade accounted for 25 percent of the improvement registered in the overall U.S. trade deficit.

RESEARCH AND DEVELOPMENT

R&D spending by the federal government increased to \$129.7 billion in fiscal 2007, the seventh consecutive year of growth. With \$73.7 billion in outlays, the DoD remained the largest conductor of government-funded R&D, accounting for well over half of all such outlays. NASA's R&D outlays totaled \$8.5 billion and the Department of Energy invested \$7.7 billion. Federally-funded R&D is scheduled to increase nearly 4 percent to \$134.6 billion in fiscal 2008.

While DoD outlays increased by more than 6 percent in fiscal 2007, other agencies saw more modest growth. Collectively, R&D outlays by the National Science Foundation, the National Institutes of Health, and the Transportation and Agriculture Departments rose 4.3 percent to \$39.7 billion.

In addition to ballistic missile defense mentioned previously, other major RDT&E programs active in fiscal 2007 included: the F-35 Joint Strike Fighter at \$4.2 billion; P-3 Modernization, \$1.1 billion; UAVs, \$716.9 million; the VH-71 Executive Helicopter, \$613.9 million; the F-22 Raptor, \$459.5 million; and the EA-18G Growler, \$361 million.

EMPLOYMENT

The ranks of the aerospace industry grew for the fourth consecutive year in 2007. On an annual average basis, total employment increased by 13,800, or 2.2 percent, to 645,600.

Aerospace employment as a percent of total manufacturing employment reached 4.7 percent, the highest level since 1993. Preliminary numbers from the Bureau of Labor Statistics suggest that the 2008 annual employment average will remain safely in positive territory.

At \$52.4 billion, the aerospace industry's 2007 payroll was up nearly 4 percent from 2006's \$50.4 billion. The aerospace payroll represented 7.1 percent of combined payroll outlays by all U.S. manufacturing industries; the comparable figure for 2006 was 6.9 percent.

AIA'S AEROSPACE INDUSTRY SALES BY PRODUCT GROUP

Calendar Years 1994 – 2008

Year	TOTAL SALES	Aircraft			Missiles	Space	Related Products and Services
		Total Aircraft	Civil	Military			
Current Dollars (billions)							
1994	\$110.6	\$57.6	\$25.6	\$32.1	\$7.6	\$26.9	\$18.4
1995	107.8	55.0	24.0	31.1	7.4	27.4	18.0
1996	116.8	60.3	26.9	33.4	8.0	29.0	19.5
1997	131.6	70.8	37.4	33.4	8.0	30.8	21.9
1998	148.0	84.0	49.7	34.3	7.7	31.6	24.7
1999	153.7	88.7	52.9	35.8	8.8	30.5	25.6
2000	144.7	81.6	47.6	34.0	9.3	29.7	24.1
2001	151.6	86.5	51.3	35.2	10.4	29.5	25.3
2002	152.4	79.5	41.3	38.1	12.8	34.6	25.4
2003	146.6	72.8	32.4	40.4	13.5	35.9	24.4
2004	155.7	79.1	32.5	46.6	14.7	35.9	26.0
2005(a)	173.3	112.2	62.1	50.1	9.1	33.5	18.6
2006	186.9	126.4	72.6	53.8	11.3	32.9	16.3
2007	200.3	134.4	80.2	54.2	12.4	32.0	21.5
2008(P)	204.4	135.3	80.6	54.7	13.2	33.4	22.5
Constant Dollars ^b (billions)							
1994	\$120.0	\$62.6	\$27.8	\$34.8	\$8.2	\$29.2	\$20.0
1995	115.4	58.9	25.7	33.3	7.9	29.3	19.2
1996	122.7	63.3	28.2	35.1	8.4	30.5	20.4
1997	136.6	73.5	38.9	34.7	8.3	32.0	22.8
1998	153.0	86.8	51.4	35.4	8.0	32.7	25.5
1999	157.5	90.9	54.2	36.7	9.0	31.3	26.3
2000	144.7	81.6	47.6	34.0	9.3	29.7	24.1
2001	147.8	84.3	50.0	34.3	10.1	28.8	24.6
2002	146.1	76.2	39.6	36.6	12.3	33.2	24.4
2003	137.0	68.1	30.3	37.8	12.6	33.5	22.8
2004	141.2	71.7	29.5	42.3	13.3	32.6	23.5
2005(a)	151.4	98.0	54.2	43.7	8.0	29.2	16.2
2006	157.5	106.5	61.2	45.3	9.5	27.7	13.8
2007	163.7	109.9	65.5	44.3	10.1	26.2	17.6
2008(P)	162.0	107.2	63.8	43.4	10.5	26.4	17.8

Source: Aerospace Industries Association (AIA) and The Teal Group, based on: company reports; *The Budget of the United States Government*; and data from the National Aeronautics and Space Administration (NASA), the Department of Commerce, and the Department of Defense.

Notes: Totals may not equal sum of terms due to rounding. Previous years' data may have been revised to reflect updated and/or newly available information.

a. Beginning in 2005, sales figures for individual product groups are not comparable to those in prior years due to revised survey methodology. However, total annual sales data remain comparable across all years.

b. Based on AIA's aerospace composite price deflator (2000=100).

P. Preliminary.

AIA'S AEROSPACE INDUSTRY SALES BY CUSTOMER

Calendar Years 1994 – 2008

Year	TOTAL SALES	Aerospace Products and Services				Related Products and Services
		Total	Department of Defense	NASA and other Govt Agencies	Other Customers	
Current Dollars (billions)						
1994	\$110.6	\$92.1	\$43.8	\$11.9	\$36.4	\$18.4
1995	107.8	89.8	42.4	11.4	36.0	18.0
1996	116.8	97.3	42.5	12.4	42.4	19.5
1997	131.6	109.7	43.7	12.8	53.2	21.9
1998	148.0	123.3	42.9	13.3	67.0	24.7
1999	153.7	128.1	45.7	13.4	69.0	25.6
2000	144.7	120.6	47.5	13.4	59.7	24.1
2001	151.6	126.4	50.1	14.5	61.8	25.3
2002	152.3	127.0	57.7	16.4	52.9	25.4
2003	146.6	122.2	64.0	15.5	42.7	24.4
2004	155.7	129.8	70.1	16.0	43.7	26.0
2005(a)	173.3	154.8	80.0	11.0	63.7	18.6
2006	186.9	170.6	86.8	9.5	74.3	16.3
2007	200.3	178.8	87.6	9.9	81.3	21.5
2008(P)	204.4	181.9	89.3	10.4	82.2	22.5
Constant Dollars ^b (billions)						
1994	\$120.0	\$100.0	\$47.5	\$12.9	\$39.5	\$20.0
1995	115.4	96.1	45.4	12.2	38.5	19.2
1996	122.6	102.2	44.7	13.0	44.5	20.4
1997	136.6	113.9	45.4	13.2	55.2	22.8
1998	153.0	127.5	44.4	13.8	69.3	25.5
1999	157.5	131.3	46.8	13.7	70.7	26.3
2000	144.7	120.6	47.5	13.4	59.7	24.1
2001	147.8	123.2	48.9	14.1	60.2	24.6
2002	146.1	121.8	55.3	15.7	50.7	24.4
2003	137.0	114.2	59.8	14.5	39.9	22.8
2004	141.2	117.6	63.5	14.5	39.6	23.5
2005(a)	151.4	135.1	69.9	9.6	55.7	16.2
2006	157.5	143.8	73.1	8.0	62.7	13.8
2007	163.7	146.2	71.7	8.1	66.4	17.6
2008(P)	162.0	144.1	70.7	8.2	65.2	17.8

Source: Aerospace Industries Association (AIA) and The Teal Group, based on: company reports; *The Budget of the United States Government*; and data from the National Aeronautics and Space Administration (NASA), the Department of Commerce, and the Department of Defense.

Notes: Totals may not equal sum of terms due to rounding. Previous years' data may have been revised to reflect updated and/or newly available information.

a. Beginning in 2005, sales figures for individual customers are not comparable to those in prior years due to revised survey methodology. However, total annual sales data remain comparable across all years.

b. Based on AIA's aerospace composite price deflator (2000=100).

P. Preliminary.

AEROSPACE SALES AND THE NATIONAL ECONOMY

Calendar Years 1994 – 2008

Year	Gross Domestic Product	Industry Sales			Aerospace Sales as Percent of:			
		Manufac- turing	Durable Goods	Aero- space	GDP	Manufac- turing	Durable Goods	
Current Dollars (billions)								
1994	\$7,072.2	\$3,242.1	\$1,767.1	\$110.6	1.6%	3.4%	6.3%	
1995	7,397.7	3,482.0	1,903.2	107.8	1.5	3.1	5.7	
1996	7,816.9	3,587.3	1,972.6	116.8	1.5	3.3	5.9	
1997	8,304.3	3,836.6	2,148.4	131.6	1.6	3.4	6.1	
1998	8,747.0	3,898.8	2,229.4	148.0	1.7	3.8	6.6	
1999	9,268.4	4,033.0	2,327.7	153.7	1.7	3.8	6.6	
2000	9,817.0	4,201.5	2,369.6	144.7	1.5	3.4	6.1	
2001	10,128.0	3,972.2	2,174.9	151.6	1.5	3.8	7.0	
2002	10,469.6	3,917.3	2,126.2	152.4	1.5	3.9	7.2	
2003	10,960.8	4,017.0	2,142.9	146.6	1.3	3.6	6.8	
2004	11,685.9	4,294.8	2,255.4	155.7	1.3	3.6	6.9	
2005	12,421.9	4,743.0	2,425.0	173.3	1.4	3.7	7.1	
2006	13,178.4	5,021.6	2,560.7	186.9	1.4	3.7	7.3	
2007	13,807.5	5,083.5	2,564.4	200.3	1.5	3.9	7.8	
2008(P)	14,291.5	5,338.9	2,552.8	204.4	1.4	3.8	8.0	
Constant Dollars ^a (billions)					Real Annual Growth			
					GDP	Manufac- turing	Durable Goods	Aero- space
1994	\$7,835.5	\$3,592.0	\$1,957.8	\$120.0	4.0%	5.1%	7.9%	(13.3)%
1995	8,031.7	3,780.5	2,066.4	115.4	2.5	5.2	5.5	(3.8)
1996	8,329.0	3,822.3	2,101.8	122.7	3.7	1.1	1.7	6.3
1997	8,703.4	4,021.0	2,251.6	136.6	4.5	5.2	7.1	11.4
1998	9,066.9	4,041.4	2,310.9	153.0	4.2	0.5	2.6	12.0
1999	9,470.3	4,120.8	2,378.4	157.5	4.4	2.0	2.9	3.0
2000	9,817.0	4,201.5	2,369.6	144.7	3.7	2.0	(0.4)	(8.1)
2001	9,890.7	3,879.1	2,124.0	147.8	0.8	(7.7)	(10.4)	2.1
2002	10,048.9	3,759.8	2,040.7	146.1	1.6	(3.1)	(3.9)	(1.2)
2003	10,301.1	3,775.3	2,013.9	137.0	2.5	0.4	(1.3)	(6.2)
2004	10,675.8	3,923.5	2,060.4	141.2	3.6	3.9	2.3	3.0
2005	10,989.5	4,196.1	2,145.4	151.3	2.9	6.9	4.1	7.2
2006	11,294.9	4,303.8	2,194.7	157.5	2.8	2.6	2.3	4.1
2007	11,523.9	4,242.7	2,140.3	163.8	2.0	(1.4)	(2.5)	3.9
2008(P)	11,695.2	4,369.0	2,089.0	162.0	1.5	3.0	(2.4)	(1.1)

Source: Aerospace Industries Association, based on data from: Council of Economic Advisers, *Economic Indicators*; and Bureau of the Census.

Note: Parentheses indicate negative real annual growth.

a. Aerospace industry constant dollar sales based on AIA's aerospace composite price deflator (2000=100).

Others based on GDP deflator (2000=100).

P. Preliminary.

SALES OF AEROSPACE ESTABLISHMENTS AS REPORTED BY THE BUREAU OF THE CENSUS

Calendar Years 1993 – 2007

Year	TOTAL SALES	Totals		Aircraft, Engines, & Parts		Missiles, Space, & Rocket Propul- sion	Other Aerospace (includes R&D)		Non-Aero- space
		Military	Non- Military	Military	Non- Military		Military	Non- Military	
Current Dollars (millions)									
1993	\$109,926	\$56,102	\$53,824	\$20,099	\$40,987	\$18,134	\$11,936	\$3,592	\$15,178
1994	104,296	58,012	46,284	23,652	30,901	18,406	11,981	4,417	14,939
1995	102,797	52,476	50,321	22,944	32,085	18,366	11,921	4,462	13,019
1996	103,115	53,153	49,962	24,804	32,722	18,506	12,171	4,624	10,287
1997	114,946	50,648	64,298	23,944	42,614	21,354	12,320	3,922	10,792
1998	119,258	45,110	74,148	23,795	52,708	16,109	7,818	5,035	13,796
1999	124,181	49,690	74,491	26,043	56,406	15,661	9,062	4,472	12,535
2000	109,311	43,256	66,055	23,196	46,477	15,603	6,035	4,785	13,215
2001	117,088	47,232	69,856	22,133	52,504	15,512	8,187	5,732	13,020
2002	115,202	55,422	59,781	25,249	43,435	15,636	11,030	5,251	14,601
2003	116,445	65,569	50,876	26,225	37,256	15,579	14,659	4,397	18,328
2004	124,329	69,027	55,301	26,008	39,667	14,239	20,480	4,403	19,531
2005	124,176	61,660	62,517	24,873	43,509	(S)	19,995	5,063	20,767
2006	155,893	72,934	82,959	27,261	(D)	(D)	24,607	6,557	(D)
2007	128,720	44,299	84,421	16,836	(D)	(D)	(D)	(D)	25,102
Constant Dollars ^a (millions)									
1993	\$122,233	\$62,383	\$59,850	\$22,349	\$45,576	\$20,164	\$13,272	\$3,994	\$16,877
1994	113,182	62,955	50,227	25,667	33,534	19,974	13,002	4,793	16,212
1995	110,032	56,169	53,863	24,559	34,343	19,659	12,760	4,776	13,935
1996	108,268	55,809	52,459	26,044	34,357	19,431	12,779	4,855	10,801
1997	119,348	52,588	66,760	24,861	44,246	22,172	12,792	4,072	11,205
1998	123,285	46,633	76,652	24,599	54,488	16,653	8,082	5,205	14,262
1999	127,274	50,928	76,346	26,692	57,811	16,051	9,288	4,583	12,847
2000	109,311	43,256	66,055	23,196	46,477	15,603	6,035	4,785	13,215
2001	114,158	46,050	68,108	21,579	51,190	15,124	7,982	5,589	12,694
2002	110,486	53,153	57,334	24,215	41,657	14,996	10,579	5,036	14,003
2003	108,817	61,274	47,543	24,507	34,816	14,558	13,699	4,109	17,127
2004	112,715	62,579	50,135	23,579	35,962	12,909	18,567	3,991	17,707
2005	108,431	53,842	54,590	21,719	37,992	(S)	17,460	4,421	18,134
2006	131,410	61,480	69,930	22,980	(D)	(D)	20,742	5,527	(D)
2007	105,238	36,218	69,020	13,765	(D)	(D)	(D)	(D)	20,523

Source: Bureau of the Census, *Aerospace Industry (Orders, Sales, and Backlog)*.

a. Based on AIA's aerospace composite price deflator (2000=100).

D. Withheld by Census Bureau to avoid disclosing data for individual companies.

S. Does not meet publication standards, as determined by the Census Bureau.

Notes: In addition to AIA's own aerospace sales figure (pages 12-13), AIA reports two unique aerospace sales figures derived from two different U.S. Census Bureau sources. Data included in page 16, and AIA's Statistic Series 8 (*Balance Sheet and Income Statement for Aerospace Industry*) and *Economic Indicators* reports are from the *Quarterly Financial Report* (QFR). Data reported on this page and page 17 are derived from the *Current Industrial Report* (CIR).

See Glossary entry for *Sales* for further information.

ORDERS, SHIPMENTS, AND BACKLOG OF AIRCRAFT & PARTS AND SEARCH & NAVIGATION EQUIPMENT

Calendar Years 1998 – 2008

Period	Combined			Aircraft & Parts			Search & Navigation Equipment	
	Total	Defense	Civil	Total	Defense	Civil	Defense	Civil
Orders (millions)								
1998	\$138,407	\$44,990	\$93,417	\$108,004	\$23,854	\$84,150	\$21,136	\$9,267
1999	140,329	48,780	91,549	107,336	25,717	81,619	23,063	9,930
2000	165,994	56,504	109,490	130,575	31,326	99,249	25,178	10,241
2001	146,897	62,685	84,212	110,484	36,284	74,200	26,401	10,012
2002	129,635	57,578	72,057	102,924	39,156	63,768	18,422	8,289
2003	132,524	69,346	63,178	99,844	44,549	55,295	24,797	7,883
2004	148,335	64,216	84,119	104,950	31,759	73,191	32,457	10,928
2005	184,119	55,365	128,754	148,643	29,893	118,750	25,472	10,004
2006	213,773	74,052	139,721	166,046	38,173	127,873	35,879	11,848
2007	271,177	73,773	197,404	225,339	40,855	184,484	32,918	12,920
2008(P)	233,653	88,109	145,544	188,651	56,565	132,085	31,544	13,459
Shipments (millions)								
1998	\$150,077	\$49,886	\$100,191	\$116,812	\$26,938	\$89,874	\$22,948	\$10,317
1999	152,728	49,396	103,332	120,242	27,719	92,523	21,677	10,809
2000	144,740	46,758	97,982	111,658	24,560	87,098	22,198	10,884
2001	153,571	52,160	101,411	118,226	27,777	90,449	24,383	10,962
2002	140,889	57,294	83,595	108,639	34,136	74,503	23,158	9,092
2003	135,955	63,667	72,288	102,931	39,096	63,835	24,571	8,453
2004	145,305	70,601	74,704	105,850	41,515	64,335	29,086	10,369
2005	152,081	66,062	86,019	114,061	37,952	76,109	28,110	9,910
2006	165,036	69,355	95,681	124,375	38,812	85,563	30,543	10,118
2007	184,334	71,337	112,997	140,827	39,700	101,127	31,637	11,870
2008(P)	196,903	86,339	110,564	152,875	54,049	98,825	32,289	11,739
Backlog (as of End-of-Year, millions)								
1998	\$209,575	\$64,834	\$144,741	\$174,585	\$36,857	\$137,728	\$27,977	\$7,013
1999	197,176	64,218	132,958	161,679	34,855	126,824	29,363	6,134
2000	218,430	73,964	144,466	180,596	41,621	138,975	32,343	5,491
2001	211,756	84,489	127,267	172,854	50,128	122,726	34,361	4,541
2002	200,502	84,773	115,729	167,139	55,148	111,991	29,625	3,738
2003	197,071	90,452	106,619	164,052	60,601	103,451	29,851	3,168
2004	200,101	84,067	116,034	163,152	50,845	112,307	33,222	3,727
2005	232,139	73,370	158,769	197,734	42,786	154,948	30,584	3,821
2006	280,876	78,067	202,809	239,405	42,147	197,258	35,920	5,551
2007	367,719	80,503	287,216	323,917	43,302	280,615	37,201	6,601
2008(P)	404,470	82,274	322,196	359,693	45,818	313,875	36,456	8,321

Source: U.S. Census Bureau, *Manufacturers' Shipments, Inventories, and Orders (M3)*.

Notes: To ensure comprehensive industry coverage, AIA reports backlog data from two different Census Bureau sources. Data on this page matches data used by AIA for its statistical series and *Year End Review and Forecast*, and may not match other pages in this book.

See Glossary entry for *Sales* for further information.

P. Preliminary.

ORDERS AND BACKLOG OF AEROSPACE ESTABLISHMENTS AS REPORTED BY THE BUREAU OF THE CENSUS

Calendar Years 1993 – 2007

Year	TOTAL	Totals		Aircraft, Engines, & Parts		Missiles, Space, & Rocket Propul- sion	Other Aerospace (includes R&D)		Non- Aero- space
		Military	Non- Military	Military	Non- Military		Military	Non- Military	
Orders (millions)									
1993	\$79,770	\$49,541	\$30,229	\$19,518	\$16,090	\$14,919	\$11,121	\$4,629	\$13,493
1994	88,706	53,268	35,438	23,352	20,166	13,705	12,924	5,395	13,164
1995	109,109	49,350	59,759	19,854	36,467	19,181	13,716	5,261	14,630
1996	126,267	62,127	64,140	25,343	45,281	27,067	12,136	5,070	11,370
1997	118,993	47,802	71,192	21,424	49,676	21,326	12,348	4,125	10,096
1998	109,993	38,678	71,314	16,870	47,613	19,699	7,628	4,468	13,715
1999	115,257	49,696	65,561	25,009	48,018	18,824	10,261	4,152	8,992
2000	140,086	54,723	85,363	31,396	65,459	18,368	7,046	3,900	13,917
2001	122,206	63,619	58,587	21,762	40,731	12,727	25,659	5,876	15,451
2002	114,830	66,437	48,393	28,498	31,482	17,288	11,156	4,985	21,420
2003	117,721	72,650	45,070	33,941	30,878	10,067	15,269	4,935	22,631
2004	131,674	76,747	54,927	26,785	44,984	17,677	19,088	3,611	19,529
2005	186,443	53,008	133,434	19,017	113,565	(S)	20,272	5,295	24,444
2006	202,842	67,709	135,133	31,285	110,967	(D)	16,724	8,620	(D)
2007	235,372	47,705	187,666	18,954	152,904	(D)	15,031	7,497	29,873
Backlog (as of End-of-Year, millions)									
1993	\$211,814	\$91,751	\$120,063	\$46,177	\$96,228	\$29,511	\$16,668	\$7,958	\$15,272
1994	192,561	84,445	108,116	44,624	85,305	24,746	15,599	8,043	14,244
1995	202,638	82,309	120,329	44,642	92,239	27,113	17,534	8,214	12,906
1996	229,871	89,500	140,371	47,635	106,341	35,440	16,176	9,339	14,940
1997	218,951	78,870	140,082	43,615	111,931	34,585	12,125	4,754	11,942
1998	200,288	69,962	130,326	37,530	106,166	31,174	9,665	3,488	12,264
1999	188,409	68,379	120,029	36,565	96,596	33,880	9,904	3,051	8,413
2000	214,966	73,741	141,225	41,250	115,241	36,283	10,028	4,081	8,083
2001	223,189	88,863	134,326	39,623	107,124	32,139	27,922	3,631	12,748
2002	222,452	99,948	122,505	42,934	96,515	33,503	30,533	3,944	18,224
2003	226,932	108,704	118,229	50,646	90,122	27,989	31,173	4,481	22,522
2004	234,272	116,509	117,763	51,428	95,356	31,337	29,707	3,690	22,755
2005	290,054	100,836	189,217	38,436	165,297	25,784	30,077	3,939	26,520
2006	334,489	92,924	241,565	42,459	(D)	(D)	22,109	6,380	(D)
2007	441,137	96,330	344,807	44,577	(D)	(D)	(D)	(D)	32,195

Source: Bureau of the Census, *Aerospace Industry (Orders, Sales, and Backlog)*.

D. Withheld by Census Bureau to avoid disclosing data for individual companies.

S. Does not meet publication standards, as determined by the Census Bureau.

Notes: To ensure comprehensive industry coverage, AIA reports backlog data from two different Census Bureau sources.

Data reported on this page and page 15 are derived from the Current Industrial Report (CIR). Data on page 16 matches data used by AIA for its statistical series and *Year End Review and Forecast*, and may not match this or other pages in this book.See Glossary entry for *Sales* for further information.

FEDERAL OUTLAYS FOR DEFENSE, NASA, AND AEROSPACE PRODUCTS AND SERVICES

Fiscal Years 1980 – 2009
(Millions of Dollars)

Year	Total National Defense	Total NASA	Federal Outlays for Aerospace Products and Services			Aerospace as Percent of Sum of Total Nat. Def. and Total NASA
			TOTAL Aerospace	DoD ^a	NASA	
1980	\$133,995	\$4,959	\$20,269	\$15,558	\$4,711	14.6%
1981	157,513	5,537	24,276	19,002	5,274	14.9
1982	185,309	6,155	29,501	23,575	5,926	15.4
1983	209,903	6,853	35,364	28,808	6,556	16.3
1984	227,413	7,055	39,663	32,723	6,940	16.9
1985	252,748	7,251	44,483	37,335	7,148	17.1
1986	273,375	7,403	49,773	42,558	7,215	17.7
1987	281,999	7,591	51,871	44,429	7,442	17.9
1988	290,361	9,092	48,848	39,922	8,926	16.3
1989	303,559	11,036	52,933	42,072	10,861	16.8
1990	299,331	12,429	53,194	40,992	12,202	17.1
1991(b)	273,292	13,878	53,630	40,089	13,541	18.7
1992(b)	298,350	13,961	50,569	37,085	13,484	16.2
1993(b)	291,086	14,305	45,496	31,763	13,733	14.9
1994	281,642	13,695	41,082	27,774	13,308	13.9
1995	272,066	13,378	36,696	23,638	13,058	12.9
1996	265,753	13,881	32,947	20,530	12,417	11.8
1997	270,505	14,360	32,808	19,888	12,920	11.5
1998	268,207	14,206	33,184	20,380	12,804	11.8
1999	274,785	13,664	32,968	20,564	12,404	11.4
2000	294,394	13,442	34,617	22,222	12,395	11.2
2001	304,759	14,199	37,212	23,451	13,761	11.7
2002	348,482	14,430	39,224	25,776	13,448	10.8
2003	404,778	14,552	39,430	26,573	12,857	9.4
2004	455,847	15,189	44,324	29,713	14,611	9.4
2005	495,326	15,613	44,655	29,906	14,749	8.7
2006	521,840	15,125	45,046	30,676	14,370	8.4
2007	552,568	15,861	46,021	30,805	15,216	8.1
2008(E)	607,263	17,318	53,374	36,697	16,677	8.5
2009(E)	675,084	18,137	62,987	45,232	17,755	9.1

Source: Office of Management and Budget, *The Budget of the United States Government*.

Notes: "National Defense" includes the military budget of the DoD and other defense-related activities.

"Total NASA" includes all categories of the NASA budget; see following table for additional explanations.

a. Outlays for aircraft and missile procurement, excluding RDT&E.

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

E. Estimate.

FEDERAL OUTLAYS FOR AEROSPACE PRODUCTS AND SERVICES

Fiscal Years 1980 – 2009
(Millions of Dollars)

Year	TOTAL Federal Aerospace	Department of Defense ^a			NASA Aerospace ^b
		Total DoD Aerospace	Aircraft	Missiles	
1980	\$20,269	\$15,558	\$11,124	\$4,434	\$4,711
1981	24,276	19,002	13,193	5,809	5,274
1982	29,501	23,575	16,793	6,782	5,926
1983	35,364	28,808	21,013	7,795	6,556
1984	39,663	32,723	23,196	9,527	6,940
1985	44,483	37,335	26,586	10,749	7,148
1986	49,773	42,558	30,828	11,730	7,215
1987	51,871	44,429	32,956	11,473 (c)	7,442
1988	48,848	39,922	28,246	11,676	8,926
1989	52,933	42,072	27,569	14,503	10,861
1990	53,194	40,992	26,142	14,851	12,202
1991	53,630	40,089	25,689	14,400	13,541
1992	50,569	37,085	23,581	13,504	13,484
1993	45,496	31,763	20,359	11,404	13,733
1994	41,082	27,774	18,840	8,934	13,308
1995	36,696	23,638	16,125	7,513	13,058
1996	32,947	20,530	14,331	6,199	12,417
1997	32,808	19,888	14,663	5,225	12,920
1998	33,184	20,380	15,473	4,907	12,804
1999	32,968	20,564	16,484	4,080	12,404
2000	34,617	22,222	17,991	4,231	12,395
2001	37,212	23,451	17,979	5,472	13,761
2002	39,224	25,776	20,546	5,230	13,448
2003	39,430	26,573	21,280	5,293	12,857
2004	44,324	29,713	22,898	6,815	14,611
2005	44,655	29,906	23,284	6,622	14,749
2006	45,046	30,676	23,176	7,500	14,370
2007	46,021	30,805	23,349	7,456	15,216
2008(E)	53,374	36,697	28,625	8,072	16,677
2009(E)	62,987	45,232	35,584	9,648	17,755

Source: Office of Management and Budget, *The Budget of the United States Government*.

Notes: Totals may not equal sum of terms due to rounding. Previous years' data may have been revised to reflect updated and/or newly available information.

a. Outlays for aircraft and missile procurement. Does not include RDT&E, which DoD has not reported by product group since 1977.

b. Excludes Construction of Facilities, Office of Inspector General, and Air Transportation.

c. Beginning in 1987, DoD combined Navy Missile Procurement with torpedoes and other related products into Navy Weapons Procurement, of which missiles comprise approximately 80 percent.

E. Estimate.

**DEPARTMENT OF DEFENSE
MILITARY OUTLAYS BY FUNCTIONAL TITLE^a**

**Fiscal Years 2000 – 2009
(Millions of Dollars)**

	2000	2001	2002	2003
TOTAL	\$281,161	\$293,995	\$331,951	\$388,870
Procurement—TOTAL	<u>\$51,696</u>	<u>\$54,986</u>	<u>\$62,515</u>	<u>\$67,926</u>
Aircraft	17,991	17,979	20,546	21,280
Missiles ^b	4,231	5,472	5,230	5,293
Ships	6,679	7,115	8,287	9,455
Weapons ^b	1,756	1,825	2,343	2,641
Ammunition	1,836	2,153	2,587	2,571
Other	19,203	20,442	23,522	26,686
Military Personnel	75,950	73,977	86,799	106,744
Research, Development, Test, and Evaluation (RDT&E)	37,602	40,599	44,389	53,098
Operations & Maintenance (O&M)	105,812	113,985	130,005	151,408
Military Construction	5,109	5,010	5,052	5,851
Family Housing	3,413	3,519	3,736	3,784
Other	1,579	1,919	(545)	59

(Continued on next page)

**DEPARTMENT OF DEFENSE
MILITARY OUTLAYS BY FUNCTIONAL TITLE^a**

**Fiscal Years 2000 – 2009, Continued
(Millions of Dollars)**

2004	2005	2006	2007	2008(E)	2009(E)
\$437,116	\$474,434	\$499,357	\$529,875	\$583,057	\$651,162
<u>\$76,216</u>	<u>\$82,294</u>	<u>\$89,757</u>	<u>\$99,647</u>	<u>\$130,477</u>	<u>\$142,843</u>
22,898	23,284	23,176	23,349	28,625	35,584
6,815	6,622	7,500	7,456	8,072	9,648
10,021	9,950	10,345	10,485	10,530	12,171
2,332	2,680	4,065	4,915	6,652	9,504
3,502	4,061	4,281	4,670	4,777	4,641
30,648	35,697	40,390	48,772	71,821	71,295
113,576	127,463	127,543	128,826	137,401	129,072
60,759	65,694	68,629	73,136	74,735	78,566
174,045	188,118	203,789	216,631	225,062	241,455
6,312	5,331	6,245	7,899	10,241	15,115
3,905	3,720	3,717	3,473	4,290	3,358
2,303	1,814	(323)	263	851	40,753

Source: Office of Management and Budget, *The Budget of the United States Government*.

Notes: Data in parentheses are credit items.

Totals may not equal sum of terms due to rounding. Previous years' data may have been revised to reflect updated and/or newly available information.

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 activities.

b. Beginning in 1987, 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.

E. Estimate.

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

Calendar and Fiscal Years 1979 – 2008

Year	GDP		Federal Government Defense Purchases		PPI, Capital Equipment	CPI, (Urban) All Items
	FY GDP	CY GDP	Goods & Services	Equipment Investment		
	(FY 2000=100)	(CY 2000=100)	(CY 2000=100)	(CY 2000=100)	(CY 1982=100)	(CY 82- 84=100)
1979	48.8	49.5	48.6	80.6	77.5	72.6
1980	53.1	54.0	53.9	85.3	85.8	82.4
1981	58.3	59.1	59.2	92.5	94.6	90.9
1982	62.3	62.7	63.4	99.0	100.0	96.5
1983	65.0	65.2	65.6	101.8	102.8	99.6
1984	67.4	67.7	70.3	103.1	105.2	103.9
1985	69.6	69.7	71.6	100.5	107.5	107.6
1986	71.3	71.3	71.6	95.5	109.7	109.6
1987	73.1	73.2	72.3	91.4	111.7	113.6
1988	75.4	75.7	73.6	90.6	114.3	118.3
1989	78.3	78.6	75.5	91.5	118.8	124.0
1990	81.3	81.6	78.0	93.2	122.9	130.7
1991	84.3	84.4	80.8	95.1	126.7	136.2
1992	86.4	86.4	83.6	95.9	129.1	140.3
1993	88.4	88.4	85.3	98.1	131.4	144.5
1994	90.3	90.3	87.4	101.0	134.1	148.2
1995	92.2	92.1	89.6	103.3	136.7	152.4
1996	94.0	93.9	92.4	103.5	138.3	156.9
1997	95.6	95.4	93.7	100.9	138.2	160.5
1998	96.8	96.5	94.6	99.5	137.6	163.0
1999	98.0	97.9	96.9	100.6	137.6	166.6
2000	100.0	100.0	100.0	100.0	138.8	172.2
2001	102.4	102.4	102.0	98.2	139.7	177.1
2002	104.3	104.2	105.8	97.0	139.1	179.9
2003	106.4	106.4	110.8	96.9	139.5	184.0
2004	109.2	109.5	115.9	98.2	141.4	188.9
2005	112.7	113.0	121.9	99.5	144.6	195.3
2006	116.4	116.7	127.4	101.0	146.9	201.6
2007	119.6	119.8	131.9	102.3	149.5	207.3
2008(E)	121.9	122.2	136.6	104.1	152.0	216.0

Source: Bureau of Economic Analysis; Bureau of Labor Statistics; and Office of Management and Budget,
The Budget of the United States Government.

CPI = Consumer Price Index for *All Urban Consumers* for 1978 and subsequent years. Previous years,
All Urban Wage Earners.

GDP = Gross Domestic Product.

PPI = Producer Price Index for Capital Equipment.

CY = Calendar Year.

FY = Fiscal Year.

E. Estimate.

PRICE DEFLATORS FOR AEROSPACE INDUSTRY

Calendar Years 1986 – 2008

Year	Aerospace Deflators (2000=100)				
	AIA Aerospace Composite	Aircraft Manufacturing	Engine and Engine Parts Manufacturing	Other Aircraft Parts and Equipment	Missiles
1986	73.0	66.4	71.7	72.4	95.2
1987	73.2	66.0	72.2	73.9	95.2
1988	74.3	67.4	74.3	76.5	91.1
1989	77.9	73.2	76.3	78.9	92.5
1990	81.0	77.1	80.6	81.2	93.2
1991	84.2	80.0	84.4	83.9	96.8
1992	87.1	82.6	88.5	87.2	98.4
1993	89.9	85.4	90.0	89.3	103.9
1994	92.1	88.3	92.3	91.2	104.5
1995	93.4	91.2	93.7	91.9	101.6
1996	95.2	93.4	95.5	95.1	100.6
1997	96.3	94.6	96.5	97.0	100.2
1998	96.7	94.8	97.2	98.3	99.4
1999	97.6	95.7	97.9	99.2	100.0
2000	100.0	100.0	100.0	100.0	100.0
2001	102.6	103.5	103.1	102.3	99.5
2002	104.3	105.5	104.3	103.3	101.9
2003	107.0	109.1	109.4	103.0	102.7
2004	110.3	113.5	114.8	103.3	103.7
2005	114.5	120.2	117.0	105.9	106.0
2006	118.6	125.4	121.5	107.4	110.0
2007	122.3	128.8	126.8	111.5	111.2
2008(E)	126.2	133.0	131.4	115.8	112.4

Source: Aerospace Industries Association, based on data from: Bureau of Labor Statistics and Bureau of Economic Analysis.
E. Estimate.

GROSS DOMESTIC PRODUCT, FEDERAL BUDGET, AND DEFENSE BUDGET

**Fiscal Years 1980 – 2009
(Billions of Dollars)**

Year	Fiscal Year GDP	Federal Budget Outlays		Defense Outlays as Percent of:	
		Total Outlays	National Defense	GDP	Total Outlays
1980	\$2,726.7	\$590.9	\$134.0	4.9%	22.7%
1981	3,054.7	678.2	157.5	5.2	23.2
1982	3,227.6	745.7	185.3	5.7	24.8
1983	3,440.7	808.4	209.9	6.1	26.0
1984	3,840.2	851.9	227.4	5.9	26.7
1985	4,141.5	946.4	252.7 (a)	6.1	26.7
1986	4,412.4	990.4	273.4	6.2	27.6
1987	4,647.1	1,004.1	282.0	6.1	28.1
1988	5,008.6	1,064.5	290.4	5.8	27.3
1989	5,400.5	1,143.8	303.6	5.6	26.5
1990	5,735.4	1,253.1	299.3	5.2	23.9
1991	5,935.1	1,324.3	273.3 (b)	4.6	20.6
1992	6,239.9	1,381.6	298.4 (b)	4.8	21.6
1993	6,575.5	1,409.5	291.1 (b)	4.4	20.7
1994	6,961.3	1,461.9	281.6	4.0	19.3
1995	7,325.8	1,515.9	272.1	3.7	17.9
1996	7,694.1	1,560.6	265.8	3.5	17.0
1997	8,182.4	1,601.3	270.5	3.3	16.9
1998	8,627.9	1,652.7	268.2	3.1	16.2
1999	9,125.3	1,702.0	274.8	3.0	16.1
2000	9,709.8	1,789.2	294.4	3.0	16.5
2001	10,057.9	1,863.2	304.8	3.0	16.4
2002	10,377.4	2,011.2	348.5	3.4	17.3
2003	10,808.6	2,160.1	404.8	3.7	18.7
2004	11,499.9	2,293.0	455.8	4.0	19.9
2005	12,237.9	2,472.2	495.3	4.0	20.0
2006	13,015.5	2,655.4	521.8	4.0	19.7
2007	13,667.5	2,730.2	552.6	4.0	20.2
2008(E)	14,311.5	2,931.2	607.3	4.2	20.7
2009(E)	15,027.0	3,107.4	675.1	4.5	21.7

Source: Office of Management and Budget, *The Budget of the United States Government*.

Notes: Totals may not equal sum of terms due to rounding. Previous years' data may have been revised to reflect updated and/or newly available information.

a. Beginning in 1985, the Federal Budget reflects establishment of a military retirement trust fund. Data for prior years adjusted for comparable treatment of the military retired pay.

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

E. Estimate.

AIRCRAFT PRODUCTION



E2C Hawkeye (U.S. Navy Photo)

In 2007, sales of military aircraft, engines, and parts tumbled more than 38 percent to \$16.8 billion, a significant change in direction from the sector's 1.9 percent compound annual growth rate (CAGR) for years 2002-2006. The decrease was reflected industry-wide. Sales of complete military aircraft and parts declined by nearly 35 percent to \$12.9 billion, while sales of military aircraft engines and parts fell by 47 percent to \$3.9 billion.

As in previous years, the U.S. Census Bureau withheld several key civil aircraft sales figures for 2007 to avoid disclosing data of individual companies. The agency did report that civil sales of aircraft engines and parts suffered significant losses in 2007, falling 45 percent to \$11.6 billion. As with military sales, this represented an abrupt shift from the upward trend seen in recent years, as the CAGR for 2002-2006 was 23 percent.

The U.S. civil aircraft industry produced and delivered a total of 286 more aircraft in 2007 than in the previous year, while the total value of all civil shipments increased by nearly 15 percent to \$42.5 billion. Shipments of civil transport aircraft grew by 43 units, with the total value increasing by 12.7 percent to \$29.2 billion.

By model, the Boeing 737 was again the civil transport aircraft in highest demand, with 330 shipped in 2007, up 9.3 percent over the previous year. The backlog of orders for the 737 jumped by 516 aircraft to 2,076, which represents a 160-percent increase compared to 2003's end-of-year figure of 800. Despite schedule setbacks, Boeing's 787 remained the most successful initial launch of any civil transport aircraft, as indicated by an



Predator UAV (U.S. Air Force Photo)



MH-60S Sea Hawk (U.S. Navy Photo)

order backlog of 817 aircraft at the end of 2007. The worldwide fleet of freighter aircraft also continued to expand in 2007, finding success on the strength of globalization and flourishing international trade.

According to AIA's annual survey of U.S. civil helicopter manufacturers, helicopter shipments rose sharply to 1,009 units in 2007, which by value was an increase of 73 percent, or nearly \$1.4 billion. MD Helicopters, Robinson, Schweizer, and Sikorsky all reported jumps in shipments for the year, and the Department of Commerce reports that foreign customers were responsible for a record number of these sales. By number of shipments, the R44 remained the most successful helicopter platform, with 664 units shipped in 2007, more than twice the number shipped in 2003.

General aviation manufacturers logged another record year in 2007, as economic growth remained strong in key markets around the world. The general aviation segment registered some 3,279 shipments, valued at almost \$12 billion. The 2007 value represents a 15-percent increase over 2006, and is significantly higher than the 7.7 percent CAGR for 2002-2006. Single-engine, piston aircraft made up the majority by quantity, and were valued at \$712 million. By comparison, 815 turbojet aircraft were shipped, with an estimated value of over \$10 billion.

Strong growth in emerging economies contributed to robust demand for U.S. general aviation products abroad. In particular, sales of business jets continued to benefit from global economic prosperity, making 2007 the fourth consecutive year of growth for the segment. Spurred by favorable economic conditions, the number of international clients has risen sharply in recent years. Although North America was still by far the most important market for business jet manufacturers, almost half of all shipments in 2007 went to customers abroad, with 24.9 percent going to Europe, 7.5 percent to Latin America, 5.2 percent to the Middle East and Africa, and 4.2 percent to Asia-Pacific.

While acceptances of military aircraft by U.S. armed services increased by 7.4 percent in 2007 to 320 aircraft, the overall flyaway value decreased by some \$100 million to \$13.9 billion (less than 1 percent). This was due to the number of acceptances decreasing for higher per-unit cost aircraft

(e.g.: fighter/attack), and increasing for helicopters, generally a lower per-unit cost aircraft. Outlays for aircraft procurement in fiscal 2007 increased slightly to \$23.3 billion, growing slower than the CAGR for 2002-2006 of 3.1 percent.

The same four aircraft programs dominated military procurement in fiscal 2007 as in fiscal 2006, although the top two exchanged the first and second positions. The Air Force's C-17 Globemaster was the largest item with 22 aircraft valued at \$4.7 billion, while the F-22 Raptor had 20 fighters valued at \$3.5 billion. Rounding out the top four were the Navy's two largest aircraft procurement programs, the F/A-18E/F Hornet and the MV-22 Osprey, valued at \$2.7 billion and \$1.7 billion, respectively.

The C-17 is a key player in U.S. military operations abroad and a notable U.S. export product. The F-22 is generally considered the world's best fighter. The Defense Department has cut funding for both planes, and their future depends on Congress providing supplemental funding to sustain procurement. If supplemental funding ceases and the U.S. Air Force fails to prioritize money, these key national aerospace products will disappear.

Another significant military aircraft sector in 2007 was unmanned aerial vehicle (UAV) production. UAVs have become increasingly important in recent years, particularly with the growing needs in Iraq and Afghanistan for aerial reconnaissance and surveillance capabilities. In 2007, U.S. military agencies procured 474 UAVs worth \$1.5 billion. By value, the largest UAV programs included the M/RQ-1 Predator, the RQ-4 Global Hawk, the RQ-7 Shadow, and the RQ-11 Raven.

The United States is the world's top developer of UAVs, and while current spending on UAVs is a fraction of that spent on manned aircraft, UAV budgets are growing at a much faster rate, with demand far outstripping current production rates. UAVs are also being utilized outside the



B-737 Jetliner (Photo Courtesy Thomas Becker)

Defense Department. Local police departments are deploying UAVs to keep watch over their airspace, and the Department of Homeland Security is seeking to use UAVs to guard civil aircraft from missile attacks.

SALES OF AIRCRAFT, ENGINES, AND PARTS

Calendar Years 1993 – 2007
(Millions of Dollars)

Year	GRAND TOTAL	TOTAL		Complete Aircraft and Parts		Aircraft Engines and Parts	
		Military	Non- Military	Military	Non- Military	Military	Non- Military
CURRENT DOLLARS							
1993	\$61,086	\$20,099	\$40,987	\$16,118	\$32,780	\$3,981	\$8,207
1994	54,553	23,652	30,901	20,127	23,176	3,525	7,725
1995	55,029	22,944	32,085	19,596	22,897	3,348	9,188
1996	57,526	24,804	32,722	20,822	20,993	3,982	11,729
1997	66,558	23,944	42,614	21,297	33,206	2,647	9,408
1998	76,503	23,795	52,708	21,154	42,541	2,641	10,167
1999	82,449	26,043	56,406	22,917	45,107	3,126	11,299
2000	69,673	23,196	46,477	19,650	37,538	3,546	8,939
2001	74,637	22,133	52,504	18,176	40,548	3,957	11,956
2002	68,683	25,249	43,435	19,579	34,278	5,670	9,157
2003	63,482	26,225	37,256	20,493	29,141	5,732	8,115
2004	65,675	26,008	39,667	21,322	28,275	4,686	11,392
2005	68,382	24,873	43,509	18,452	31,409	6,421	12,100
2006	(D)	27,261	(D)	19,855	(D)	7,406	21,194
2007	(D)	16,836	(D)	12,924	(D)	3,913	11,600
CONSTANT DOLLARS ^a							
1993	\$67,925	\$22,349	\$45,576	\$17,922	\$36,450	\$4,427	\$9,126
1994	59,201	25,667	33,534	21,842	25,151	3,825	8,383
1995	58,902	24,559	34,343	20,975	24,508	3,584	9,835
1996	60,401	26,044	34,357	21,863	22,042	4,181	12,315
1997	69,107	24,861	44,246	22,113	34,478	2,748	9,768
1998	79,086	24,599	54,488	21,868	43,978	2,730	10,510
1999	84,503	26,692	57,811	23,488	46,230	3,204	11,580
2000	69,673	23,196	46,477	19,650	37,538	3,546	8,939
2001	72,770	21,579	51,190	17,721	39,533	3,858	11,657
2002	65,872	24,215	41,657	18,778	32,875	5,438	8,782
2003	59,324	24,507	34,816	19,151	27,232	5,357	7,583
2004	59,540	23,579	35,962	19,330	25,634	4,248	10,328
2005	59,712	21,719	37,992	16,112	27,427	5,607	10,566
2006	(D)	22,980	(D)	16,737	(D)	6,243	17,865
2007	(D)	13,765	(D)	10,566	(D)	3,199	9,484

Source: Bureau of the Census, *Aerospace Industry (Orders, Sales, and Backlog)*.

Notes: In addition to AIA's own aerospace sales data (pages 12-13), AIA reports sales data derived from two unique U.S. Census Bureau sources. Data reported on this page, and pages 15, 17, and 29 are derived from the *Current Industrial Report (CIR)*.

See Glossary entry for *Sales* for further information.

a. Based on AIA's aerospace composite price deflator (2000=100).

D. Withheld by Census Bureau to avoid disclosing data for individual companies.

ORDERS AND BACKLOG OF AIRCRAFT, ENGINES, AND PARTS

Calendar Years 1993 – 2007
(Millions of Dollars)

Year	GRAND TOTAL	TOTAL		Complete Aircraft and Parts		Aircraft Engines and Parts	
		Military	Non- Military	Military	Non- Military	Military	Non- Military
NET NEW ORDERS							
1993	\$35,608	\$19,518	\$16,090	\$15,853	\$11,238	\$3,665	\$4,852
1994	43,518	23,352	20,166	19,806	12,854	3,546	7,312
1995	56,321	19,854	36,467	16,248	27,156	3,606	9,311
1996	70,624	25,343	45,281	21,755	33,802	3,588	11,479
1997	71,100	21,424	49,676	19,102	41,439	2,322	8,237
1998	64,483	16,870	47,613	14,051	37,362	2,819	10,251
1999	73,027	25,009	48,018	21,422	35,529	3,587	12,489
2000	96,855	31,396	65,459	27,440	54,335	3,956	11,124
2001	62,493	21,762	40,731	18,144	27,525	3,618	13,206
2002	59,979	28,498	31,482	20,946	25,333	7,552	6,149
2003	64,819	33,941	30,878	28,151	24,248	5,790	6,630
2004	71,770	26,785	44,985	21,926	35,622	4,859	9,363
2005	132,582	19,017	113,565	14,410	95,274	4,607	18,291
2006	142,252	31,285	110,967	26,210	90,919	5,075	20,048
2007	171,858	18,954	152,904	14,748	136,616	4,206	16,288
BACKLOG AS OF END-OF-YEAR							
1993	\$142,405	\$46,177	\$96,228	\$41,732	\$82,772	\$4,445	\$13,456
1994	129,929	44,624	85,305	40,206	72,295	4,418	13,010
1995	136,871	44,642	92,229	39,673	77,802	4,969	14,427
1996	153,976	47,635	106,341	42,788	91,851	4,847	14,490
1997	155,546	43,615	111,931	40,562	100,022	3,053	11,909
1998	143,696	37,530	106,166	34,866	94,161	2,664	12,005
1999	133,161	36,565	96,596	33,374	83,412	3,191	13,184
2000	156,491	41,250	115,241	37,650	99,942	3,600	15,299
2001	146,747	39,623	107,124	36,456	90,370	3,167	16,754
2002	139,449	42,934	96,515	37,884	82,832	5,050	13,683
2003	140,768	50,646	90,122	45,538	77,927	5,108	12,195
2004	146,784	51,428	95,355	46,166	85,249	5,262	10,106
2005	203,733	38,436	165,297	34,987	149,050	3,449	16,247
2006	(D)	42,459	(D)	41,342	(D)	1,117	15,093
2007	(D)	44,577	(D)	43,166	(D)	1,411	19,781

Source: Bureau of the Census, *Aerospace Industry (Orders, Sales, and Backlog)*.

Notes: To ensure comprehensive industry coverage, AIA reports orders and backlog data from two different Census Bureau sources. Data reported on this page, and pages 15, 17, and 28 are derived from the *Current Industrial Report (CIR)*. Data on page 16 matches data used by AIA for its statistical series and *Year End Review and Forecast*, and may not match this or other pages in this book.

See Glossary entry for *Sales* for further information.

D. Withheld by Census Bureau to avoid disclosing data for individual companies.

U.S. AIRCRAFT SHIPMENTS: CIVIL

Calendar Years 1983 – 2007
(Number of Aircraft)

Year	TOTAL	Domestic			Exports		
		Trans- ports	Heli- copters	General Aviation	Trans- ports	Heli- copters	General Aviation
1983	3,356	133	187	2,172	129	216	519
1984	2,999	102	143	2,013	83	233	425
1985	2,691	126	247	1,545	152	137	484
1986	2,156	171	120	1,031	159	210	464
1987	1,800	187	116	598	170	242	487
1988	1,949	206	103	500	217	280	643
1989	2,448	138	221	225	260	294	1,310
1990	2,268	215	254	335	306	349	809
1991	2,181	204	253	487	385	318	534
1992	1,790	180	112	541	387	212	358
1993	1,630	130	83	631	278	175	333
1994	1,545	87	154	543	222	154	385
1995	1,625	119	82	714	137	210	363
1996	1,662	97	64	732	172	214	383
1997	2,269	122	87	1,140	252	259	409
1998	3,115	184	125	1,794	375	238	399
1999	3,456	279	180	1,972	341	181	503
2000	3,780	217	189	2,391	268	304	411
2001	3,559	273	106	2,172	253	309	446
2002	2,893	117	24	1,875	262	294	321
2003	2,935	121	118	1,788	160	399	349
2004	3,445	137	238	2,000	148	567	355
2005	4,094	130	240	2,266	160	707	591
2006	4,443	152	212	2,445	246	686	702
2007	4,729	153	108	2,191	288	901	1,088

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

U.S. AIRCRAFT SHIPMENTS: MILITARY

Calendar Years 1983 – 2007
(Number of Aircraft)

Year	TOTAL	U.S. Military Agencies	Exports^a
1983	1,053	766	287
1984	936	561	375
1985	919	643	276
1986	1,107	708	399
1987	1,210	725	485
1988	1,305	687	618
1989	1,261	614	647
1990	1,053	666	387
1991	911	556	355
1992	753	421	332
1993	954	437	517
1994	766	418	348
1995	816	354	462
1996	558	242	316
1997	511	151	360
1998	418	149	269
1999	357	133	224
2000	333	138	195
2001	347	196	151
2002	359	228	131
2003	383	234	149
2004	418	251	167
2005	587	324	263
2006	996	298	698
2007	915	320	595

Source: Department of Commerce, International Trade Administration.

a. Includes FMS and military aircraft exported via commercial contracts,
directly from manufacturers to foreign governments.

CIVIL AIRCRAFT SHIPMENTS

Calendar Years 1994 – 2007

Year	TOTAL	Transport Aircraft ^a	Helicopters	General Aviation
Number of Aircraft Shipped				
1994	1,545	309	308	928
1995	1,625	256	292	1,077
1996	1,662	269	278	1,115
1997	2,269	374	346	1,549
1998	3,115	559	363	2,193
1999	3,456	620	361	2,475
2000	3,780	485	493	2,802
2001	3,559	526	415	2,618
2002	2,893	379	318	2,196
2003	2,935	281	517	2,137
2004	3,445	285	805	2,355
2005	4,094	290	947	2,857
2006	4,443	398	898	3,147
2007	4,729	441	1,009	3,279
Value (Millions of Dollars)				
1994	\$20,666	\$18,124	\$185	\$2,357
1995	18,299	15,263	194	2,842
1996	20,805	17,564	193	3,048
1997	31,753	26,929	231	4,593
1998	41,449	35,663	252	5,534
1999	45,161	38,171	187	6,803
2000	38,637	30,327	270	8,040
2001	42,399	34,155	247	7,997
2002	35,000	27,574	157	7,269
2003	27,833	21,033	366	6,434
2004	27,815	20,484	515	6,816
2005	31,424	21,941	816	8,667
2006	37,044	25,875	802	10,367
2007	42,486	29,160	1,385	11,941

Source: Aerospace Industries Association, based on company reports, data from the General Aviation Manufacturers Association (GAMA), and AIA estimates.

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.

SHIPMENTS OF CIVIL TRANSPORT AIRCRAFT^a

Calendar Years 2003 – 2007

	2003	2004	2005	2006	2007
TOTALS:					
Number of Aircraft	281	285	290	398	441
Value(E) (Millions of Dollars)	\$21,033	\$20,484	\$21,941	\$25,875	\$29,160

Company and Model:**Boeing:**

Total	281	285	290	398	441
B-717 (MD-95) ^b	12	12	13	5	-
B-737	173	202	212	302	330
B-747	19	15	13	14	16
B-757	14	11	2	-	-
B-767	24	9	10	12	12
B-777	39	36	40	65	83

Source: Aerospace Industries Association, based on company reports.

a. U.S.-manufactured fixed-wing aircraft over 33,000 pounds.

b. Formerly reported as Douglas.

E. Estimate.

SPECIFICATIONS OF U.S. CIVIL JET TRANSPORT AIRCRAFT^a

On Order or in Production as of 2008

Model and Designation	Initial Service	Standard Mixed Class	Operating Empty Weight (000's lbs)	Max Takeoff Weight (000's lbs)	Range (Nautical Miles)	Engine Manufacturer ^b and Model
FOUR ENGINES						
747-8*	2010	467	467	970	8,000	GE GENX
747-400*	1989	416-524	399	875	7,260	GE CF6-80C2, P&W PW4000, or RR RB211-524.
TWO ENGINES						
737-600	1998	110-130	80	146	3,050	CFMI CFM56-7B
737-700	1997	126-149	84	155	3,365	CFMI CFM56-7B
737-700ER	2006	126	84	171	5,510	CFMI CFM56-7B
737-800	1998	162-189	91	174	3,060	CFMI CFM56-7B
737-900ER	2007	180-215	98	188	3,200	CFMI CFM56-7B
757-200	1983	200-228	130	255	3,900	RR RB211-535 or P&W PW2000.
757-300	1998	243-280	142	273	3,395	RR RB211-535 or P&W PW2000.
767-200ER*	1984	181-255	182	395	6,600	P&W PW4000 or GE CF6-80C2.
767-300ER*	1988	218-350	198	412	5,975	P&W PW4000 or GE CF6-80C2.
767-400ER*	2000	245-375	229	450	5,625	P&W PW4000, or GE CF6-80C2.
777-200*	1995	305-440	307	545	5,235	RR Trent, GE GE90, or P&W PW4000.
777-200ER*	1997	301-440	315	656	7,700	RR Trent, GE GE90, or P&W PW4000.
777-200LR*	2005	301	326	766	9,380	GE GE90
777-300*	1998	368-550	354	660	6,015	RR Trent, GE GE90, or P&W PW4000.
777-300ER*	2004	365	367	775	7,930	GE GE90
787-3*	2012	290-330	223	364	3,050	GE GENX or RR Trent.
787-8*	2008	210-250	242	484	8,200	GE GENX or RR Trent.
787-9*	2012	250-290	254	540	8,500	GE GENX or RR Trent.

Source: Aerospace Industries Association, based on company reports.

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

b. P&W = Pratt & Whitney; GE = General Electric; RR = Rolls-Royce; CFMI = General Electric/Snecma.

* Wide-body aircraft.

CIVIL TRANSPORT AIRCRAFT BACKLOG^a

**As of End-of-Year
Calendar Years 2003 – 2007**

	2003	2004	2005	2006	2007
TOTAL AIRCRAFT ON ORDER:					
Number of Aircraft	1,051	1,062	1,791	2,451	3,427
Value(E) (<i>Millions of Dollars</i>)	\$69,133	\$76,345	\$133,197	\$184,610	\$270,728
Boeing (U.S. & Foreign):					
B-717 (MD-95) ^b	22	18	5	—	—
B-737	800	771	1,123	1,560	2,076
B-747	32	27	58	116	125
B-757	13	2	—	—	—
B-767	25	25	30	28	52
B-777	159	167	288	299	357
B-787	—	52	287	448	817
TOTAL FOREIGN ORDERS:					
Number of Aircraft	464	568	1,239	1,730	2,581
Value(E) (<i>Millions of Dollars</i>)	\$37,939	\$48,109	\$100,971	\$139,554	\$213,418
Boeing:					
B-717 (MD-95) ^b	2	2	—	—	—
B-737	299	347	684	1,008	1,493
B-747	30	27	44	85	101
B-757	8	2	—	—	—
B-767	25	24	29	27	24
B-777	100	114	240	233	284
B-787	—	52	242	377	679

Source: Aerospace Industries Association, based on company reports.

a. Unfilled announced orders excluding options for U.S.-manufactured transport aircraft over 33,000 pounds.

Includes new transports contracted for lease from the manufacturer.

b. Formerly reported as Douglas.

E. Estimate.

SPECIFICATIONS OF SELECTED U.S. CIVIL HELICOPTERS

Company	Model	Crew / Passengers	Useful Load (Lbs.)	Range (Nautical Miles)	External Cargo Payload (Lbs.)
Bell/Agusta Aerospace	BA609	10-11	5,500	750	—
Enstrom Helicopter	F-28 Series	3	960	229	1,000
	280 Series	3	930	229	1,000
	480 Series	5	1,200	375	1,000
MD Helicopters	500 Series	5	1,519	239	2,069
	520 Series	5	1,764	182	2,264
	530 Series	5	1,509	202	2,159
	600 Series	8	2,000	330	3,000
Robinson Helicopter	900 Series	8	2,875	255	3,525
	R22	2	515	180	—
	R44	4	980-994	348-365	—
Schweizer Aircraft	300C	3	950	201	1,050
	300CBi	2-3	662	NA	—
	330/333	4	1,300	310	—
Sikorsky Aircraft	S-76C	14	4,695	411	3,300
	S-92	21	9,748	539	8,000

Source: Helicopter Association International, *2008 Helicopter Annual*.

CIVIL HELICOPTER SHIPMENTS^a

Calendar Years 2003 – 2007

	2003	2004	2005	2006	2007
CIVIL SHIPMENTS:					
Number of Aircraft	517	805	947	898	1,009
Value (Millions of Dollars)	\$366	\$515	\$816	\$802	\$1,385
Brantly—TOTAL	<u>1</u>	<u>-</u>	<u>2</u>	<u>-</u>	<u>-</u>
B-2B	1	-	2	-	-
Enstrom—TOTAL	<u>17</u>	<u>23</u>	<u>29</u>	<u>23</u>	<u>19</u>
F-28/280 Series	7	5	15	10	6
480 Series	10	18	14	13	13
MD Helicopters^b—TOTAL	<u>16</u>	<u>10</u>	<u>3</u>	<u>13</u>	<u>18</u>
500 Series	3	1	-	DNR	3
520 Series	1	-	2	DNR	3
530 Series	3	1	-	DNR	2
600 Series	1	4	1	DNR	3
900 Series	8	4	-	DNR	7
Robinson—TOTAL	<u>422</u>	<u>690</u>	<u>806</u>	<u>749</u>	<u>823</u>
R22	128	234	243	97	159
R44	294	456	563	652	664
Schweizer—TOTAL	<u>38</u>	<u>48</u>	<u>58</u>	<u>61</u>	<u>70</u>
300C	20	13	12	12	11
300CB/300CBi	15	27	40	44	51
330/333	3	8	6	5	8
Sikorsky—TOTAL	<u>23</u>	<u>34</u>	<u>49</u>	<u>52</u>	<u>79</u>
S-70	-	1	-	-	-
S-76	23	29	30	36	50
S-92	-	4	19	16	29

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. Please note that shipments from Bell Helicopter's Canadian facilities are excluded as are other foreign-produced helicopters, but reported separately below for information purposes only.

b. Formerly reported as McDonnell Douglas.

DNR. Firm did not report information.

Bell—TOTAL	<u>105</u>	<u>111</u>	<u>123</u>	<u>159</u>	<u>181</u>
206B	10	7	16	20	28
206L/LT	6	18	22	21	24
407	46	40	41	67	73
412	29	33	29	35	39
427	7	9	5	7	10
430	7	4	10	9	7

GENERAL AVIATION AIRCRAFT SHIPMENTS BY SELECTED MANUFACTURERS

Calendar Years 2003 – 2007

	2003	2004	2005	2006	2007
NUMBER OF AIRCRAFT SHIPPED:					
TOTAL	2,137	2,355	2,857	3,147	3,279
Single-Engine, Piston	1,519	1,706	2,024	2,208	2,097
Multi-Engine, Piston	71	52	71	79	77
Turboprop	163	194	240	256	290
Turbojet	384	403	522	604	815
VALUE OF SHIPMENTS:					
TOTAL (<i>Millions of Dollars</i>)	\$6,434	\$6,816	\$8,667	\$10,367	\$11,941
Piston	\$440	\$568	\$712	\$722	\$712
Turboprop	411	555	749	853	1,001
Turbojet	5,583	5,693	7,205	8,792	10,227

***Number of Aircraft Shipped by
Selected Manufacturers:***

Adam	-	-	2	4	3
Alpha Aviation	-	-	-	5	13
American Champion	63	94	89	60	70
Aviat	47	42	47	-	-
Cessna	841	899	1,155	1,239	1,274
Cirrus Design	469	553	600	721	710
Columbia (formerly Lancair)	51	78	114	185	152
Gulfstream	50	56	63	71	79
Learjet	31	48	67	71	80
Liberty	-	-	2	29	38
Maule	31	25	27	38	36
Mooney	36	37	85	75	79
Piper	229	189	233	238	221
Raytheon	263	310	354	398	430
Tiger	18	19	15	3	-

Source: General Aviation Manufacturers Association.

Notes: Totals may not equal sum of terms due to rounding. Previous years' data may have been revised to reflect updated and/or newly available information.

SPECIFICATIONS OF SELECTED U.S. MILITARY AIRCRAFT

Primary Mission, DoD Designation, & Popular Name	Manufac- turer	U.S. Military Service	Crew	Empty Weight (000's lbs.)	Engines	Performance Typical for Primary Mission	Remarks
FIGHTER / ATTACK							
EA-18G Growler	Boeing	USN	2	33	2xGE F414	Mach 1.6+ class	Airborne electronic attack
F-15E Strike Eagle	Boeing	USAF	2	34	2xP&W F100	Mach 2.5 class	Multirole fighter / long range interdiction
F-16C/D Fighting Falcon	LM	USAF	1-2	19	1xP&W F100/ 1xGE F110	Mach 2+ class	Multirole fighter
F/A-18E/F Hornet	Boeing/NGC	USN	1-2	32	2xGE F414	Mach 1.6+ class	Multi-mission strike fighter
F-22A Raptor	LM/Boeing	USAF	1	32	2xP&W F119	Mach 2+ class	Air superiority with near-precision ground attack
F-35 Lightning II	LM/NGC/BAE	USAF/USN	1	29-32	1xP&W F135	Mach 1.6+ class	Multirole air superiority
BOMBER / COMMAND / CONTROL / PATROL							
E-2C Hawkeye 2000	NGC	USN	5	40	2xRR T56	6+ hr. duration	AEW battle mgmt.; active & passive detection
E-8C Joint STARS	NGC	USAF/Army	21+	171	4xP&W JT3D	11-20+ hr. loiter	Ground surveillance/battle mgmt.
ER/MD UAS	GA-ASI	USA	2	2	Thielert 135	40 hr. duration	Recon, surveillance, attack
I-GNAT ER	GA-ASI	USA	2	1	Rotax 914	40+ hr. duration	Reconnaissance
MQ-1 Predator	GA-ASI	USN/USAF	2	1	Rotax 914	40 hr. duration	Recon. and surveillance
MQ-9 Reaper	GA-ASI	USN/USAF	2	5	HI TPE 331	30+ hr. duration	Recon, surveillance, attack
RC-12 P/Q	Raytheon	Army	2	9	2xP&W PT6A	4 hr. loiter	Electronic intercept
RQ-7B Shadow 200	AAI	Army	0-2	0.3	1xAR 74	6+ hr. duration	Recon. and surveillance
YAL-1A Airborne Laser	Boeing	USAF	6	TBD	4xGE CF6	TBD	Airborne high-energy chemical laser system
CARGO-TRANSPORT / TANKER							
C-12R	Raytheon	Army	2	8	2xP&W PT6A	268 mph; 788 n.m.	Utility/transport
C-17A Globemaster III	Boeing	USAF	3	283	4xP&WF117	Mach 0.77; 4267 n.m.	102 troops or 164,900 lbs.
C-20F/G/H	Gulfstream	All	3-5	42-43	2xRR Tay	Mach 0.80; 4200 n.m.	Versions of Gulfstream IV
C-32	Boeing	USAF	5-7	125	2xP&W 2000	Mach 0.80; 3950 n.m.	Transport of USG officials
C-37A/B	Gulfstream	All	3-5	48	2xBR 710	Mach 0.80; 6750 n.m.	Version of Gulfstream V
C-40A	Boeing	USN	3-7	92	2xCFM 56-7	Mach 0.79; 3000 n.m.	Navy Unique Fleet Essential Aircraft
C-40B/C	Boeing	USAF	3-7	92	2xCFM 56-7	Mach 0.79; 5000 n.m.	Special air mission aircraft
C/EC/HC/WC-130J	LM	USAF/ANG/ AFRC/USCG	3	97	4xRR AE2100	396 mph; 3260 mi.	41,000 lbs.
KC-130J	LM	USMC	3	97	4xRR AE2100	12,100 gals.	Tanker
MV/CV-22 Osprey	Bell/Boeing	USMC/USAF	2-3	33	2xRR AE1107C	Max 316 mph	With internal fuel tanks, engine nacelles tilt for STOL
UC-27	Cessna	Army/USN	1	5	1xP&W PT6A	200 mph; 907 n.m.	Utility/transport/special missions
UC-35B/D	Cessna	Army/USMC	2	10	2xP&W 535A	Mach 0.75; 1700 n.m.	Utility/transport
TRAINER							
T-1A Jayhawk	Raytheon	USAF	2	10	2xP&W JT-15D	Max 538 mph	Tanker/transport trainer
T-6A Texan II	Raytheon	USN/USAF	2	5	1xP&W PT6A-68	Max 368 mph	Primary trainer
T-45C Goshawk	Boeing/BAE	USN	2	11	1xRR F405	Mach 0.85, 675 mph	Next generation trainer
TH-57 Sea Ranger	Bell	USN	1	2	1xRR 250	Max 135 mph; 405 mi.	Rotary wing trainer
TH-67 Creek	Bell	Army	1	2	1xRR 250	Max 135 mph; 405 mi.	Rotary wing trainer
HELICOPTER							
AH-1Z	Bell	USMC	2	12	2xGE T700	Max 256 mph; 475 mi.	Attack helicopter
AH-64D Apache	Boeing	Army	2	11	2xGE T700	Max 226 mph; 280 mi.	Attack helicopter
CH-47F Chinook	Boeing	Army	3	25	2xHI T55	Max 196 mph; 368 mi.	Transport
CH-53E	Sikorsky	USN	3-8	33-36	3xGE T64	Max 196 mph; 710 mi.	55 passengers, aux. tanks/ minesweeping
HH/SH-60 Seahawk	Sikorsky	USN	4-12	14	2xGE T700	Max 184 mph; 500 mi.	Combat search and rescue, SOF
HH/MH-60G Pave Hawk	Sikorsky	USAF	3	12	2xGE T700	Max 184 mph; 1380 mi.	11 troops; combat; search; rescue
MH-60R	Sikorsky	USN	3	15	2xGE T700	Max 161 mph; 435 mi.	Anti-sub/ship warfare; SAR
MH-60S	Sikorsky	USN	4	11	2xGE T700	Max 184 mph; 373 mi.	Vertical replenishment
UH-1Y	Bell	USMC	2	12	2xGE T700	Max 219 mph; 400 mi.	Utility assault helicopter
UH-60L Black Hawk	Sikorsky	Army	3	11	2xGE T700	Max 184 mph; 373 mi.	Utility assault helicopter
UH-60M	Sikorsky	Army	4-11	13	2xGE T701	Max 173 mph; 363 mi.	Utility assault helicopter; SAR
VH-71	LM/Agusta Westland/Bell	USMC	NA	NA	3xGE CT7-8E	NA	Presidential transport

Source: Aerospace Industries Association, based on company reports.
Key: BAE = BAE Systems; BR = BMW-Rolls Royce; GA-ASI = General Atomics Aeronautical Systems; GE = General Electric;
HI = Honeywell; LHTEC = Light Helicopter Turbine Engine Co.; LM = Lockheed Martin; NGC = Northrop Grumman;
P&W = Pratt & Whitney; RR = Rolls-Royce.
TBD. To be determined.

MILITARY AIRCRAFT PROGRAM PROCUREMENT^a

Fiscal Years 2007, 2008, and 2009
(Costs in Millions of Dollars)

Agency and Model	2007		2008(E)		2009(E)	
	No.	Cost	No.	Cost	No.	Cost
AIR FORCE						
A-10 Thunderbolt(m)	—	\$276.2	—	\$168.0	—	\$144.1
B-2 Stealth Bomber(m)	—	110.0	—	246.7	—	367.2
B-52(m)	—	63.9	—	33.1	—	41.7
C-5 Galaxy(m)	—	202.8	—	338.8	—	601.3
C-17 Globemaster	22	4,721.7	—	438.8	—	699.1
C-37A	—	112.8	—	0.4	—	2.4
C-130J Hercules	14	1,630.2	9	975.1	—	578.2
C-135(m)	—	86.2	—	124.9	—	134.2
Civil Air Patrol Aircraft(m)	—	10.2	—	6.2	—	2.4
CV-22	3	341.7	5	508.1	6	445.9
E-3 AWACS(m)	—	66.3	—	53.8	—	86.5
F-15E Eagle(m)	—	287.7	—	64.3	—	32.5
F-16 Falcon(m)	—	380.1	—	352.2	—	287.3
F-22A Raptor	20	3,540.6	20	3,810.3	20	3,381.2
F-35 Joint Strike Fighter	2	571.7	6	1,412.1	8	1,810.7
T-6A JPATS	48	308.7	39	261.2	—	63.2
T-38(m)	—	143.1	—	129.9	—	59.9
Unmanned Aerial Vehicles(b)	474	1,472.2	775	1,270.8	575	1,532.2
ARMY						
AH-64 Apache(m)	—	\$1,485.0	—	\$814.2	—	\$637.3
Armed Recon. Helicopter	—	0.1	10	174.6	28	438.9
CH-47 Chinook	—	1,308.8	6	1,099.6	16	1,167.7
Light Utility Helicopter (LUH)	26	148.4	43	228.9	36	224.5
UH-60 Black Hawk	66	1,271.9	78	1,364.8	63	1,063.0
NAVY						
C-40A(b)	—	\$ —	—	\$ —	2	\$155.0
E-2C Hawkeye	2	202.7	—	52.2	3	589.1
E-6 Mercury(m)	—	54.7	—	84.6	—	88.9
EA-6B Prowler(m)	—	227.6	—	30.4	—	33.4
EA-18G Growler	9	735.7	18	1,308.2	22	1,651.6
F-5	5	4.5	—	—	—	—
F/A-18E/F Hornet	37	2,737.1	24	2,074.9	23	1,911.3
F-35 Joint Strike Fighter	—	124.5	6	1,223.8	8	1,860.9
T-6A JPATS	20	146.7	44	303.1	44	298.1
KC-130J Hercules	3	233.4	4	251.8	2	153.5
MH-60R Strikehawk	25	913.0	27	990.8	31	1,185.8
MH-60S Knighthawk	18	546.3	18	500.2	18	549.7
MV-22	14	1,702.2	21	2,014.0	30	2,261.9
P-3(m)	—	282.6	—	248.8	—	297.9
T-45S Goshawk	10	410.5	—	89.1	—	67.7
UH-1Y/AH-1Z	11	493.7	15	415.6	20	474.1

Source: Department of Defense Budget, *Program Acquisition Costs by Weapon System and Procurement Programs (P-1)*.

a. Total Obligational Authority for procurement, excludes RDT&E. See Research and Development chapter for aircraft program RDT&E authorization data.

b. DoD-wide / Joint funding; includes high and medium altitude aircraft.

m. Modification of inservice aircraft.

E. Estimate.

MILITARY UNMANNED AERIAL VEHICLE (UAV) PROCUREMENT^a

Fiscal Years 2007, 2008, and 2009
(Costs in Millions of Dollars)

Model	2007		2008(E)		2009(E)	
	No.	Cost	No.	Cost	No.	Cost
TOTAL	474	\$1,472.2	775	\$1,270.8	575	\$1,532.2
M/RQ-1 Predator	48	\$428.5	24	\$276.1	38	\$378.2
RQ-4 Global Hawk	5	442.6	5	580.9	5	712.2
RQ-7 Shadow	72	262.0	28	162.3	4	20.5
MQ-8B VTUAV	4	37.4	0	37.4	3	55.3
MQ-9 Reaper	12	247.6	4	58.1	9	161.4
RQ-11 Raven	333	15.5	702	33.3	504	30.0
MQ-1C Warrior	—	38.6	12	122.7	12	174.6

Source: Department of Defense Budget, Fiscal Year 2009 *Budget Request Summary Justification, Procurement Programs (P-1)*.

a. Total Obligational Authority for procurement, excludes RDT&E.

E. Estimate.

**DEPARTMENT OF HOMELAND SECURITY:
EXPENDITURES FOR AIRCRAFT ACQUISITION
AND MODIFICATION, AND OTHER SELECTED PROGRAMS**

**Fiscal Years 2007, 2008, and 2009
(Thousands of Dollars)**

	2007	2008(E)	2009(E)
Aircraft Total	\$43,804	\$77,730	\$48,460
CN-235 Maritime Patrol Aircraft	\$13,464	\$48,940	\$17,320
HH-60 Pave Hawk	9,861	11,460	10,540
HH-65 Dolphin	6,475	12,700	13,700
HC-130H Hercules	9,791	3,780	4,900
Unmanned Aerial System	4,213	850	2,000
Other	\$60,478	\$32,255	\$32,560
C4ISR	\$27,592	\$17,926	\$17,620
Deepwater Logistics System	25,057	7,300	7,540
Systems Engineering and Integration	7,829	7,029	7,400

**DEPARTMENT OF HOMELAND SECURITY:
AIRCRAFT ACQUISITIONS**

**Fiscal Years 2006-2009
(Number of Aircraft)**

	2006	2007	2008(E)	2009(E)
Aircraft	14	14	30	2
UAS	3	1	1	1

Source: U.S. Department of Homeland Security Budget.

E. Estimate.

UAS = Unmanned Aerial System.

**DEPARTMENT OF DEFENSE OUTLAYS
FOR AIRCRAFT PROCUREMENT
BY AGENCY**

**Fiscal Years 1980 – 2009
(Millions of Dollars)**

Year	TOTAL	Air Force	Army	Navy
1980	\$11,124	\$6,647	\$787	\$3,689
1981	13,193	7,941	855	4,397
1982	16,793	9,624	1,297	5,872
1983	21,013	11,799	1,724	7,490
1984	23,196	12,992	2,165	8,040
1985	26,586	15,619	2,705	8,263
1986	30,828	18,919	2,987	8,922
1987	32,956	20,036	3,306	9,614
1988	28,246	15,961	2,878	9,407
1989	27,569	14,662	2,834	10,073
1990	26,142	14,303	2,808	9,031
1991	25,689	13,794	2,840	9,055
1992	23,581	13,154	2,520	7,907
1993	20,359	11,438	1,675	7,246
1994	18,840	10,303	1,711	6,826
1995	16,125	8,891	1,549	5,685
1996	14,331	7,862	1,435	5,034
1997	14,663	7,799	1,542	5,322
1998	15,473	8,236	1,392	5,845
1999	16,484	8,928	1,532	6,024
2000	17,991	8,979	1,268	7,744
2001	17,979	8,217	1,358	8,404
2002	20,546	10,424	1,633	8,489
2003	21,280	11,303	1,781	8,196
2004	22,898	12,003	2,042	8,853
2005	23,284	11,999	2,491	8,794
2006	23,176	11,783	2,618	8,775
2007	23,349	10,858	3,532	8,959
2008(E)	28,625	12,953	4,657	11,015
2009(E)	35,584	14,850	5,853	14,881

Source: Office of Management and Budget, *Budget of the United States Government*.
E. Estimate.

MILITARY AIRCRAFT ACCEPTED BY U.S. MILITARY AGENCIES

Calendar Years 1993 – 2007

Year	TOTAL	Bomber/ Patrol/ Command/ Control	Fighter/ Attack	Transport/ Tanker	Trainer	Heli- copters ^a	Other
NUMBER OF AIRCRAFT							
1993	437	7	205	25	56	144	-
1994	418	6	133	40	114	122	3
1995	354	4	66	32	102	135	15
1996	242	4	46	28	54	110	-
1997	151	4	34	16	26	71	-
1998	149	8	26	30	33	52	-
1999	133	6	46	45	12	24	-
2000	138	2	51	30	33	22	-
2001	196	3	58	36	52	38	9
2002	228	4	75	30	55	46	18
2003	234	3	57	33	64	61	16
2004	251	5	67	44	75	38	22
2005	324	4	66	57	72	104	21
2006	298	-	69	45	76	81	27
2007	320	4	62	39	33	149	33
FLYAWAY VALUE (Millions of Dollars)							
1993	\$9,601	\$1,314	\$4,736	\$1,553	\$484	\$1,514	\$ -
1994	12,018	3,861	3,062	3,298	477	1,303	17
1995	10,444	3,585	1,975	2,759	460	1,568	98
1996	8,791	3,596	1,419	2,350	337	1,088	-
1997	6,277	1,921	1,204	2,248	270	635	-
1998	9,296	4,699	846	2,890	319	542	-
1999	7,211	415	2,733	3,588	219	256	-
2000	7,424	140	3,018	3,651	356	259	-
2001	7,537	218	3,480	2,962	376	440	61
2002	9,020	295	3,707	3,950	407	456	205
2003	9,736	204	3,960	4,447	371	626	128
2004	12,755	346	6,013	5,067	523	575	231
2005	14,666	281	6,901	5,863	518	1,062	41
2006	13,966	-	7,005	5,004	623	1,108	226
2007	13,859	385	5,474	4,369	339	2,785	507

Source: Aerospace Industries Association, based on USAF, USA, and USN 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.

a. Beginning in 2005, values for helicopters include remanufactured aircraft.

MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES AIR FORCE^a

Calendar Years 2006 – 2007
(Costs in Millions of Dollars)

	Number of Aircraft		Flyaway Cost^b		Weapon System Cost^c	
	2006	2007	2006	2007	2006	2007
TOTAL	142	98	\$8,520	\$6,600	\$10,574	\$7,958
Fighter/Attack:						
Total	27	22	\$ 4,299	\$ 2,966	\$ 5,073	\$ 3,683
F/A-22	27	22	4,299	2,966	5,073	3,683
Transports/Tankers:						
Total	26	21	\$ 3,690	\$ 3,016	\$ 4,720	\$ 3,470
C-17	15	12	2,933	2,453	3,753	2,660
C-130 variants	8	7	539	414	664	621
CV-22	3	2	218	149	303	189
Trainers:						
Total	62	22	\$ 305	\$ 111	\$ 341	\$ 127
T-6	62	22	305	111	341	127
Other:						
Total	27	33	\$ 226	\$ 507	\$ 441	\$ 678
Predator UAV	25	27	140	161	338	223
RQ-4A Global Hawk	2	6	86	346	103	454

Source: Aerospace Industries Association, based on USAF survey responses.

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.

MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES ARMY^a

Calendar Years 2006 – 2007
(Costs in Millions of Dollars)

	Number of Aircraft		Flyaway Cost ^b		Weapon System Cost ^c	
	2006	2007	2006	2007	2006	2007
TOTAL	69	108	\$ 774	\$ 1,815	\$ 862	\$ 1,989
Transports/Tankers:						
Total	-	-	\$ -	\$ -	\$ -	\$ -
JCA	-	-	-	-	-	-
Helicopters:						
Total	69	108	\$ 774	\$ 1,815	\$ 862	\$ 1,989
CH-47	5	30	(d) 115	712	121	769
HH-60L	-	7	-	110	-	122
TH-67	-	1	-	2	-	2
UH-60L	22	25	221	259	251	294
UH-60M	9	23	(f) 151	393	156	407
AH-64D	33	22	(d) 287	339	334	395

Source: Aerospace Industries Association, based on USA survey responses.

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.

d. Includes remanufactured aircraft.

f. Includes prototypes.

MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES NAVY^a

Calendar Years 2006 – 2007
(Costs in Millions of Dollars)

	Number of Aircraft		Flyaway Cost ^b		Weapon System Cost ^c	
	2006	2007	2006	2007	2006	2007
TOTAL	87	114	\$ 4,672	\$ 5,444	\$ 5,678	\$ 6,889
Patrol:						
Total	-	4	\$ -	\$ 385	\$ -	\$ 494
E-2	-	4	-	385	-	494
Fighter/Attack:						
Total	42	40	\$ 2,706	\$ 2,508	\$ 3,154	\$ 2,918
F/A -18	42	40	2,706	2,508	3,154	2,918
E/A-18G	-	-	-	-	-	-
Transports/Tankers:						
Total	19	18	\$ 1,314	\$ 1,353	\$ 1,701	\$ 1,834
C-37	1	2	50	103	55	108
C-40	1	-	63	-	77	-
KC-130	4	3	237	190	332	247
UC-35	1	-	16	-	16	-
MV-22	12	13	948	1,060	1,221	1,479
Trainers:						
Total	14	11	\$ 318	\$ 228	\$ 372	\$ 274
T-6 JPATS	-	3	-	15	-	17
T-45TS	14	8	318	213	372	257
Helicopters:						
Total	12	41	\$ 334	\$ 970	\$ 451	\$ 1,369
MH-60R	7	9	239	308	345	531
MH-60S	5	21	95	399	106	444
AH-1Z/UH-1Y	-	11	-	263	-	395

Source: Aerospace Industries Association, based on USN budget timelines.

a. Navy acceptances for own use; excludes FMS shipments.

b. *Flyaway Cost* includes airframe, engines, electronics, communications, armament, other installed equipment, non-recurring costs, and ancillary equipment.

c. *Weapons System Cost* (Investment Cost) includes flyaway cost, initial spares, ground equipment, training equipment, and other support items.

MISSILE PROGRAMS



SM-3 Missile (U.S. Navy Photo)

Sales of missile systems reached \$12.4 billion in 2007, as determined by the Aerospace Industries Association (AIA). The increase of over \$1 billion represented a 10-percent jump from the previous year.

In the past, the Bureau of the Census provided figures for the sector's sales, new orders, and backlog of orders, which were reported within this chapter. However, Census withheld these data for 2007 to avoid disclosing confidential business information for individual firms.

The missile sector includes sales of missile systems and parts, as well as Missile Defense Agency (MDA) funding for research and development.

Fiscal year (FY) 2007 missile procurement outlays for the Defense Department remained steady at just under \$7.5 billion. The FY 2007 budget plan for Defense included \$4.2 billion (a 2.7-percent increase) for Air Force procurement of missile systems, \$2.0 billion (a 6.9-percent increase) for Navy procurement, and \$1.3 billion (a 17.4-percent decrease) for Army procurement.

In 2007, the Air Force and Navy acquired 10,585 Joint Direct Attack Munitions (JDAM) guidance kits that convert unguided bombs into "smart" munitions. The Defense Department's inventory of JDAM is nearing capacity, which is expected reduce 2008 procurements by an estimated 50-percent.



MH-60R Firing the AGM-114 Hellfire (U.S. Navy Photo)

MDA funding for missile research, development, testing and evaluation increased by 22 percent in 2007 to \$9.4 billion. Programs receiving the most funding included the Midcourse Defense Segment (\$3 billion), the Terminal Defense

Segment (\$1.1 billion), and BMD Aegis (\$1.1 billion). The MDA also continued procurement of the Patriot surface-to-air missile system in 2007, at a cost of \$495 million.

The United States formally began negotiations with Poland and the Czech Republic in early 2007 regarding the construction of missile-defense shields in those countries. These plans were part of the ground-based Midcourse Defense Segment, which included provisions for missile defense sites throughout Europe.

The Minuteman III modification program was the most sweeping Air Force missile program in FY 2007, costing \$640.2 million. Initialized in 1966, the program involves keeping Minuteman III missiles in service at least until 2020. For the Navy, the Trident II submarine-launched ballistic missile was the largest program by cost. The Navy is replacing obsolete components on the Trident II with off-the-shelf commercial hardware, and upgrading the guidance and reentry systems. These improvements



AMRAAM Launched from F-16 (Raytheon Photo)

will extend the missile's life expectancy to 2042. The Army's most expensive missile program was the High Mobility Artillery Rocket System (HIMARS), at \$190 million.

Raytheon's AIM-9 Sidewinder and AIM-120 Advanced Medium-Range-Air-to-Air Missile (AMRAAM) dominate the air-to-air missile market. The growing tactical fighter fleets of the U.S. and other militaries will lead to growth in the short and medium range air-to-air missiles segments.

In May 2007, Boeing was selected to continue development of the Joint Dual-Role Air Dominance Missile (JDRAAM). This dual-range/dual-role air-to-air missile is capable of reaching close-in and beyond-visual-range targets. If the Defense Department initiates an actual development program, new missiles would enter service within the decade-timeframe.

The new Joint Air-to-Ground Missile (JAGM) is designed to replace seven types of missiles in the U.S. inventory. Development of the JAGM was launched in 2008, and the missile has yet to become a formal “program of record”. The JAGM will incorporate improved “fire and forget” capability, and will operate on all current air platforms.

The trend from highly specialized missiles to multi-capability missiles such as the JAGM will only continue as technology allows weapons systems to become more intelligent.



F-16C Firing AGM-65H Missile (U.S. Air Force Photo)

Global demand for missiles remains strong and shows no sign of slowing for the foreseeable future. Based on preliminary data, AIA believes that 2008 sales of missiles will be \$13.2 billion. Compared to other weapons systems, the missile sector may fare particularly well in the challenging economic times expected ahead. When defense budgets are squeezed, it is extremely cost effective to add new missiles to older aircraft, thereby increasing capabilities without replacing entire aircraft systems.

ORDERS, SALES, AND BACKLOG OF MISSILE SYSTEMS AND PARTS^a

Calendar Years 1993 – 2007
(Millions of Dollars)

Year	SALES	
	Current Dollars	Constant Dollars ^b
1993	\$7,713	\$8,576
1994	5,294	5,745
1995	4,688	5,018
1996	4,792	5,031
1997	4,024	4,178
1998	4,356	4,503
1999	4,521	4,634
2000	5,567	5,567
2001	6,241	6,085
2002	7,218	6,923
2003	7,729	7,223
2004	6,386	5,789
2005	5,398	4,714
2006	6,224	5,247
2007	(D)	-

Year	NET NEW ORDERS	BACKLOG as of End-of-Year
1993	\$4,775	\$9,305
1994	2,785	5,823
1995	3,164	4,833
1996	8,672	6,563
1997	4,239	5,828
1998	4,884	6,539
1999	3,753	5,342
2000	9,738	9,389
2001	5,215	9,547
2002	8,742	11,072
2003	9,855	13,198
2004	4,050	10,785
2005	3,759	8,908
2006	7,924	10,608
2007	(D)	(D)

Source: Bureau of the Census, *Aerospace Industry (Orders, Sales, and Backlog)*.

a. Excludes engines and propulsion units, where separable.

b. Based on AIA's aerospace composite price deflator (2000=100).

D. Withheld by Census Bureau to avoid disclosing data for individual companies.

**DEPARTMENT OF DEFENSE OUTLAYS
FOR MISSILE PROCUREMENT
BY AGENCY**

**Fiscal Years 1980 – 2009
(Millions of Dollars)**

Year	TOTAL	Air Force	Army	Navy
1980	\$4,434	\$1,810	\$651	\$1,973
1981	5,809	2,366	1,146	2,297
1982	6,782	3,069	1,269	2,444
1983	7,795	3,383	1,600	2,812
1984	9,527	4,640	2,079	2,809
1985	10,749	5,409	2,399	2,941
1986	11,731	6,473	2,478	2,780
1987	11,473	6,002	2,314	3,157
1988	11,676	6,046	2,239	3,392
1989	14,503	7,349	2,709	4,445
1990	14,851	7,951	2,453	4,446
1991	14,400	6,906	2,540	4,954
1992	13,504	6,409	2,401	4,694
1993	11,404	5,424	2,187	3,794
1994	8,934	4,312	1,384	3,238
1995	7,513	3,845	974	2,694
1996	6,199	3,235	919	2,045
1997	5,225	2,743	936	1,546
1998	4,907	2,543	964	1,400
1999	4,080	2,299	783	998
2000	4,231	2,243	926	1,062
2001	5,472	2,982	1,248	1,242
2002	5,230	2,719	1,256	1,255
2003	5,293	2,802	1,273	1,218
2004	6,815	4,040	1,295	1,480
2005	6,622	3,733	1,373	1,516
2006	7,500	4,074	1,594	1,832
2007	7,456	4,182	1,316	1,958
2008(E)	8,072	4,391	1,469	2,212
2009(E)	9,648	4,980	2,089	2,579

Source: Office of Management and Budget, *The Budget of the United States Government*.

E. Estimate.

MAJOR MISSILE PROGRAMS IN RESEARCH, DEVELOPMENT, OR PRODUCTION

As of 2008

Program	Agency	Status	Systems Contractor	Propulsion Manufacturer	Guidance Manufacturer
AIR-TO-AIR:					
AMRAAM-120C	USAF/USN	P	Ray	ATK	Ray/NGC/BAE
MALD	USAF	D	Ray	—	Ray/Hi
Sidewinder AIM-9X	USN/USAF	P	Ray	ATK	Ray/BAE
AIR-TO-SURFACE:					
AGM-142	USAF	P	LM/Rafael	Rafael	NGC/BAE
EGBU 15	USAF	P	Ray	—	Honeywell
GATS/GAM	USAF	P	NGC	—	Honeywell
HSAD	USN	D	USN	Aerojet	ATK
JASSM	USN/USAF	P	LM	TCM	Hi/BAE
JASSM-ER	USAF	D	LM	WI	Hi/BAE
JCM	Army/USN	D	LM	Aerojet/Roxel	LM/Hi
JDAM	All	P	Boeing	—	Hi/Boeing/RC
JSOW-154	USN/USAF	P	Ray	—	Hi/Kearfott
Maverick-65D/G/H/K	USAF	P	Ray	ATK	Ray
Maverick-65E	USN/USMC	D	Ray	ATK	Ray
Maverick-65F	USN	P	Ray	ATK	Ray
Paveway II/III	USN/USAF	P	Ray/LM	—	Ray
Paveway III Enhanced	USN/USAF	P	Ray	—	Ray/Hi
SLAM-ER-84H/K	USN	P	Boeing	TCM	Hi/Boeing/RC
Small Diameter Bomb	USAF	P	Boeing	—	Hi/Ray/RC
WCMD	USAF	P	LM	—	LM/BAE/Hi
ANTI-SUBMARINE:					
VLA-44A	USN	P	LM	ATK	LM
BATTLEFIELD SUPPORT AND ANTIARMOR:					
BTERM	USN	D	ATK	ATK	Draper Labs
CKEM	Army	D	LM	ATK	L-3/Litton/Hi
Excalibur	Army	P	Ray	—	Hi/L-3/BAE/NGC
HELLFIRE II-114K	Army/USMC	P	LM	ATK	LM
Javelin	Army/USMC	P	Ray/LM	Aerojet	LM/Ray/BAE

(Continued on Next Page)

MAJOR MISSILE PROGRAMS IN RESEARCH, DEVELOPMENT, OR PRODUCTION

As of 2008, continued

Program	Agency	Status	Systems Contractor	Propulsion Manufacturer	Guidance Manufacturer
BATTLEFIELD SUPPORT AND ANTIARMOR: (continued)					
LRLAP	USN	D	LM	ATK	Honeywell
MLRS-30	Army	P	LM	Aerojet	—
Predator SRAW	USMC	P	LM	ATK	LM
TOW2A-71E	Army	P	Ray	ATK	Ray/BAE
TOW2A-71H	Army/USMC	P	Ray	ATK	Ray/BAE
TOW2B-71F	USMC	P	Ray	ATK	Ray/BAE
SURFACE-TO-AIR:					
GMD	MDA/Army	P	Boeing	ATK/Aerojet	Ray/Boeing
PAC-3	Army	P	LM	Aerojet	LM/HI/Boeing/NGC
RAM-RIM 116B	USN	P	Ray	ATK	Ray/RAMSYS
SeaSparrow-7M	USN	P	Ray	ATK	Ray/BAE
SeaSparrow-Evolved	USN	P	Ray	ATK/Raufoss	Ray/HI/BAE/NGC
Standard 1	USN	P	Ray	Aerojet	Ray/HI
Standard 2	USN	P	Ray	Aerojet	Ray/HI
Standard 3	USN	P	Ray	Aerojet/ATK	Ray/HI/NGC
Standard 6	USN	D	Ray	Aerojet/ATK	Ray
Stinger-92D/E	All	P	Ray	Aerojet	Ray/HI
THAAD	Army	D	LM	UTC/Aerojet	LM/Honeywell
Viper Strike	SoCom/Army	P	NGC	—	NTC/BAE/EFW
SURFACE-TO-SURFACE:					
AGS LRAP	USN	D	LM	ATK	Honeywell
ATACMS	Army	P	LM	Aerojet	Honeywell
GMLRS	Army	P	LM	Aerojet	Honeywell
Minuteman III	USAF	P	NGC	ATK/UTC/Aerojet	Boeing
NLOS-LS-PAM	Army	D	Ray/LM	Aerojet	Ray
Tomahawk Tactical	USN	P	Ray	WI/Aerojet	Ray/HI/Kearfott
Trident II	USN	P	LM	ATK/Aerojet	Ray/HI/Kearfott

Source: Aerospace Industries Association, based on company reports.

Status: R-Research; D-Development; P-Production.

Key: ATK = Alliant Techsystems; BAE = BAE Systems; HI = Honeywell; LM = Lockheed Martin;
 LSI = Lear Siegler; MI = MEADS International; NASC = Naval Air Systems Command;
 NGC = Northrop Grumman; Ray = Raytheon; RC= Rockwell Collins; UTC = United Technologies;
 TCM = Teledyne Continental Motors; WI = Williams International.

MISSILE PROGRAM PROCUREMENT^a

Fiscal Years 2007, 2008, and 2009
(Costs in Millions of Dollars)

	2007		2008(E)		2009(E)	
	No.	Cost	No.	Cost	No.	Cost
Air Force:						
AIM-9X	357	\$83.9	319	\$106.9	480	\$134.7
AMRAAM(b)	101	202.5	226	280.1	428	441.6
JASSM	163	156.5	115	160.0	260	240.3
JDAM(b)	10,585	280.7	5,174	150.4	3,816	115.0
Minuteman III mods	-	640.2	-	502.0	-	296.4
Predator Hellfire	1,847	144.1	-	-	642	63.6
SDB	2,030	114.7	1,395	94.7	2,612	133.2
SFW	305	118.4	-	-	-	-
WCMD	-	3.1	-	-	-	-
Army:						
ATACMS	18	\$76.3	-	\$ -	-	\$ -
GMLRS	925	125.0	1,482	201.8	1,938	247.2
HIMARS	44	190.3	57	225.1	57	246.0
Javelin	250	158.1	385	166.8	605	259.3
Longbow Hellfire	-	-	-	45.7	-	48.6
TOW 2	949	50.3	2,255	110.0	1,586	96.0
MDA:						
Patriot	112	\$494.6	108	\$469.7	108	\$512.1
Navy:						
ESSM	100	\$99.1	85	\$82.7	86	\$85.1
Hellfire	1,111	100.4	439	45.4	1,068	95.4
JSOW	388	124.1	416	130.4	496	149.1
RAM	90	56.6	90	75.5	90	74.3
Standard	75	137.0	75	158.6	70	228.0
Tomahawk	355	353.0	394	380.5	207	281.1
Trident II	-	914.4	12	1,044.7	24	1,093.2

Source: Department of Defense, *Procurement Programs (P-1)*.

a. Total Obligational Authority excluding initial spares and RDT&E.

b. Navy and Air Force funding.

E. Estimate.

**MISSILE PROGRAMS RESEARCH,
DEVELOPMENT, TEST, AND EVALUATION^a
BY AGENCY AND MODEL**

**Fiscal Years 2007, 2008, 2009
(Millions of Dollars)**

	2007	2008(E)	2009(E)
Air Force:			
ALCM	\$3.6	\$4.60	\$0.4
Advanced Cruise Missile	6.8	-	-
AMRAAM(b)	39.5	35.9	62.8
ICBM	56.3	31.1	65.6
JASSM(b)	59.8	41.2	35.5
JDAM	21.0	-	-
SDB(b)	132.1	153.9	144.7
Tactical AIM Missiles(b)	16.4	12.2	12.4
Army:			
CAP*	\$322.9	\$369.8	\$431.3
Common Missile	24.2	-	-
JAGM	-	-	118.5
MDA:			
BMD(c)	\$8,273.7	\$7,630.4	\$7,871.5
Navy:			
HARM	\$97.8	\$43.6	\$31.4
JAGM	-	-	62.5
JSOW	26.8	29.1	22.5
Standard	177.1	226.8	234.7
Tomahawk	22.4	15.7	14.2
Trident II	105.7	118.7	143.5

Source: Department of Defense Budget, *RDT&E Programs (R-1)*.

a. Total Obligational Authority.

b. Navy and Air Force funding.

c. Army and MDA funding.

E. Estimate.

* Patriot/MEADS Combined Aggregate Program (CAP).

Missile Program Acronyms:

AIM = Air Intercept Missile
AMRAAM = Advanced Medium Range Air-to-Air Missile
HARM = High-speed Anti-Radiation Missile
JAGM = Joint Air-to-Ground Missile
JDAM = Joint Direct Attack Munition
MEADS = Medium Extended Air Defense System

ALCM= Air-Launched Cruise Missile
BMD = Ballistic Missile Defense
ICBM = Inter-Continental Ballistic Missile
JASSM = Joint Air-to-Surface Stand-off Missile
JSOW = Joint Standoff Weapon
SDB = Small Diameter Bomb

BALLISTIC MISSILE DEFENSE FUNDING**Fiscal Years 2005 – 2009****(Millions of Dollars)**

Category and Title	Program Element	2005	2006	2007	2008(E)	2009(E)
TOTAL		\$10,003	\$8,618	\$9,781	\$9,109	\$9,860
BMDO/MDA Programs:						
Total		\$8,991	\$7,687	\$9,389	\$8,655	\$9,336
Military Construction:						
Total		<u>\$23</u>	<u>\$5</u>	<u>\$8</u>	<u>\$103</u>	<u>\$445</u>
BRAC		–	–	–	103	160
BMDS European						
Interceptor Site		–	–	–	–	133
BMDS An/TPY-2 #3		–	–	–	–	30
BMD Midcourse						
Defense Segment		20	–	–	–	109
BMD Test & Targets	0603888C	3	5	8	–	–
Other		–	–	–	–	14
RDT&E:						
Total		<u>\$8,969</u>	<u>\$7,682</u>	<u>\$9,381</u>	<u>\$8,552</u>	<u>\$8,891</u>
TMD		–	–	–	–	–
MEADS	0603869C	–	–	–	–	–
THAAD System	0604861C	–	–	–	–	–
PAC-3	0604865C	–	–	–	–	–
Navy Area	0604867C	–	–	–	–	–

(Continued on next page)

BALLISTIC MISSILE DEFENSE FUNDING

Fiscal Years 2005 – 2009, continued
(Millions of Dollars)

Category and Title	Program Element	2005	2006	2007	2008(E)	2009(E)
RDT&E: (continued)						
BMD Technology	0603175C	\$228	\$147	\$184	\$108	\$119
Advanced Concepts, Evaluation, & Systems	0603879C	231	–	–	–	–
BMD System Segment	0603880C	–	–	–	–	–
Terminal Defense Segment	0603881C	944	1,121	1,083	1,045	1,019
Midcourse Defense Segment	0603882C	4,630	2,391	2,985	2,243	2,077
BMD Aegis	0603892C	–	893	1,125	1,126	1,158
Multiple Kill Vehicle	0603894C	–	48	134	230	355
BMD System Space Programs	0603895C	–	–	–	17	30
Boost Defense Segment	0603883C	498	456	622	510	421
Sensors Segment	0603884C	606	284	515	586	1,077
BMD Satellites/STSS	0603893C	–	220	311	232	242
BMD System Interceptors	0603886C	348	200	341	340	387
BMD Test & Targets	0603888C	717	606	585	622	665
BMD Products	0603889C	405	387	–	–	–
BMD C2BMC	0603896C	–	–	249	448	289
BMD Hercules	0603897C	–	–	46	53	56
BMD Joint Warfighter Support	0603898C	–	–	50	49	70
BMD JNIC	0603904C	–	–	104	79	96
BMD Concurrent Test & Operations	0603905C	–	–	22	–	–
Regarding Trench	0603906C	–	–	–	2	3
Small Business						
Innovative Research - MDA	0605502C	–	133	143	–	–
SBX	0603907C	–	–	–	165	–
Special Programs - MDA	0603891C	–	271	347	197	288
BMD System Core	0603890C	410	410	426	414	432
Pentagon Reservation						
Maintenance Fund	0901585C	14	15	16	6	20
Headquarters Management	0901598C	117	99	93	80	87
Undistributed Cuts		(180)	–	–	–	–
BMD-Related Programs — TOTAL		\$1,012	\$931	\$392	\$454	\$525
Army Missile						
Defense Improvement	0203801A	\$34	\$16	\$17	\$30	\$38
Army MEADS	0603869A	251	–	–	–	–
Army PAC-3	0604865A	641	–	–	–	–
Patriot/MEADS CAP	0604869A	–	839	323	370	431
JTAMDO	0605126J	86	76	52	54	55

Source: Missile Defense Agency.

Note: The Army combined RDT&E funding for PAC-3 and MEADS into a single funding line in FY 2006 budget request.

E. Estimate.

SPACE PROGRAMS

Space-sector sales remained fairly flat in 2007, dropping 2.7 percent from 2006. This was consistent with the sector's negative 1.9 percent compound annual growth rate (CAGR) for 2002-2006. According to data compiled by the Aerospace Industries Association, space-related sales totaled \$32.0 billion, and included NASA and Defense Department research and development (R&D) and procurement, as well as commercial launch services and satellites.

Net new orders of space vehicle systems was a notable area of growth in 2007. The 20-percent increase pushed the tally to over \$6 billion, as reported by the Bureau of the Census.

Breakouts of the sector's sales, new orders, and backlog of orders by military and non-military components were not available for 2007, as Census withheld the figures to avoid disclosing business confidential information for individual firms.

The upward trend of government investment in space that began in fiscal year (FY) 2000 continued in FY 2007. Federal outlays reached \$38.8 billion, compared with \$35.8 billion in FY 2006. The year-over-year increase amounted to 8.3 percent, beating the 5.0 percent CAGR for fiscal years 2002 to 2006. In FY 2007, NASA had outlays of \$15.2 billion, while the Defense Department spent \$22.1 billion on space.

Federal budget authority for space activities in FY 2007 was virtually unchanged from the previous year. The increase of 0.4 percent was well below the 6.4 percent CAGR for fiscal years 2002-2006. In FY 2007, the Defense Department and NASA again accounted for the largest shares by far, 57 percent and 39 percent, respectively. Comparing growth rates, for fiscal years 2003-2007, Defense budget authority increased at a slightly faster pace (3.7 percent CAGR) than did NASA's allotment (2.0 percent CAGR). Projected budget authority for the Defense Department includes a \$5 billion dollar jump in FY 2008, a nearly 16 percent increase.



STS-118 Launch (NASA Photo)



Atlas V on Launch Pad (U.S. Air Force Photo)

The Defense Department's largest space program in 2007 was the Air Force's Evolved Expendable Launch Vehicle (EELV), with \$852 million allotted for procurement. The EELV program utilizes proven hardware from Delta II, ATLAS II, and Titan IV vehicles to meet the military's long term needs for affordable and reliable access to Earth orbit.

The Defense Department had procurement outlays of \$361.8 million for the Wideband Gapfiller Satellite program, aimed at increasing communication capabilities for the United States, as well as for allied nations' military forces. Boeing Satellite Systems is slated to build the system's constellation of

six satellites. Wideband Gapfiller will replace the Defense Satellite Communications System, and will support the Department's war-fighting information exchange requirements.

The Transformational Satellite Communications System (TSAT) was the Air Force's largest space research, development, test and evaluation (RDT&E) program in 2007. The system is designed to enable net-centric warfare by delivering Internet-like capabilities to warfighters without terrestrial connections. Once complete, this high capacity network will serve the Defense Department, NASA, and the U.S. intelligence community.

The global satellite manufacturing industry fell off slightly in 2007, due to over-capacity and financial stress. Still, the United States retained its leading position, accounting for 41 percent of global satellite manufacturing revenue.

For commercial geosynchronous satellites, orders decreased to \$2.6 billion in 2007 from an estimated \$4.4 billion the previous year. However, backlogs increased to \$10.9 billion. EADS Astrium led the market in terms of orders, followed by Virginia-based Orbital Sciences and California-based Space Systems/Loral. Space Systems/Loral is the only U.S. manufacturer whose annual revenues come mainly from the commercial sector.

The Middle East was one of the most dynamic markets for commercial satellites in 2007, with 13 active operators. Middle Eastern satellites were

booked at 73 percent capacity, on the strength of television, and voice and data traffic. Reportedly, commercial satellite operators and manufacturers generally consider rocket availability the most significant risk to their growth prospects.

In 2007, the United States led the world in total backlog of commercial launch contracts, with 78 unfilled orders. However, there were only 6 new orders for U.S. commercial launches in 2007, down from 9 the previous year. At the same time, European and Russian year-over-year totals for launch orders increased. Europe had 21 (up from 10) and Russia had 19 (up from 4).

In the Expendable Launch Vehicle (ELV) market, government customers comprise two-thirds of global launches, a trend that generally protects the ELV market from the turmoil often experienced within the commercial launch market. Although Russian, Ukrainian, and Chinese ELV manufacturers will likely produce more ELVs through 2016 than the United States, the American-made ELV market will have greater value due to high-ticket items like the Atlas V and the Delta IV.

AIA expects that U.S. space sales will increase by over \$1 billion in 2008, to \$33.4 billion. NASA's near-term future activities include launching the eight remaining space shuttle missions in 2009 and 2010, at which time the fleet is expected to retire, although additional flights are being considered. NASA plans to replace the shuttle fleet with the Orion spacecraft, which is currently undergoing testing and development.



Delta II Launch Carrying NAVSTAR GPS Satellite
(U.S. Air Force Photo)

Budget limitations have increasingly forced NASA to fund one program at the expense of another. The agency's short-term focus on returning to the moon has curtailed work on other projects such as nuclear thermal rocket propulsion.

ORDERS, SALES, AND BACKLOG OF SPACE VEHICLE SYSTEMS

Calendar Years 1993 – 2007
(Millions of Dollars)

Year	SALES (Current Dollars)			SALES (Constant Dollars) ^a		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1993	\$7,317	\$4,175	\$3,142	\$6,077	\$3,468	\$2,610
1994	10,594	5,707	4,887	8,592	4,629	3,964
1995	11,314	4,782	6,532	9,037	3,819	5,217
1996	11,698	5,613	6,085	9,189	4,409	4,780
1997	14,643	4,919	9,724	11,404	3,831	7,573
1998	9,491	4,227	5,264	7,346	3,272	4,074
1999	9,022	5,107	3,915	6,940	3,928	3,012
2000	8,164	3,723	4,441	6,102	2,783	3,319
2001(b)	9,032	4,413	4,619	6,588	3,219	3,369
2002(b)	7,946	3,824	4,121	5,708	2,747	2,960
2003(b)	7,325	3,784	3,542	5,112	2,641	2,472
2004(b)	7,321	3,846	3,475	4,943	2,597	2,346
2005(b)	(S)	(S)	(S)	-	-	-
2006(b)	6,759	(D)	(D)	4,209	-	-
2007(b)	(D)	(D)	(D)	-	-	-

Year	NET NEW ORDERS			BACKLOG AS OF END-OF-YEAR		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1993	\$8,436	\$5,106	\$3,330	\$13,663	\$7,384	\$6,279
1994	9,041	4,896	4,145	12,888	6,732	6,156
1995	13,212	4,679	8,533	15,650	5,872	9,778
1996	16,527	8,888	7,639	23,004	9,125	13,879
1997	15,078	4,584	10,494	23,189	8,848	14,341
1998	12,420	4,563	7,857	20,372	7,970	12,402
1999	11,175	7,912	3,263	22,356	10,666	11,690
2000	7,205	2,310	4,895	21,395	8,942	12,453
2001(b)	7,267	3,719	3,548	21,886	5,767	16,121
2002(b)	7,968	5,176	2,793	21,620	7,166	14,456
2003(b)	(258)	(1,992)	1,732	14,037	1,390	12,647
2004(b)	12,704	13,032	(329)	19,412	10,582	8,830
2005(b)	(S)	(S)	(S)	15,561	9,386	6,175
2006(b)	5,013	(D)	(D)	13,599	(D)	(D)
2007(b)	6,001	(D)	(D)	(D)	(D)	(D)

Source: U.S. Census Bureau, *Aerospace Industry (Orders, Sales, and Backlog)*.

Note: Excludes engines and propulsion units, where separable.

a. Based on AIA's aerospace composite price deflator (2000=100).

b. Due to disclosure limitations, space propulsion units combined with space vehicle systems.

D. Withheld by Census Bureau to avoid disclosing data for individual companies.

S. Does not meet Census Bureau publication standards.

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

Calendar Years 1993 – 2007
(Millions of Dollars)

Year	SALES (Current Dollars)			SALES (Constant Dollars) ^a		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1993	\$3,104	\$1,619	\$1,485	\$2,578	\$1,345	\$1,233
1994	2,518	1,123	1,395	2,042	911	1,131
1995	2,364	1,035	1,329	1,888	827	1,062
1996	2,016	635	1,381	1,584	499	1,085
1997	2,687	558	2,129	2,093	435	1,658
1998	2,262	496	1,766	1,751	384	1,367
1999	2,118	525	1,593	1,629	404	1,225
2000	1,872	683	1,189	1,399	510	889
2001(b)	239	239	-	174	174	-
2002(b)	472	472	-	339	339	-
2003(b)	525	525	-	366	366	-
2004(b)	533	533	-	360	360	-
2005(b)	996	996	-	645	645	-
2006(b)	(D)	(D)	(D)	-	-	-
2007(b)	(D)	(D)	(D)	-	-	-

Year	NET NEW ORDERS			BACKLOG AS OF END-OF-YEAR		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1993	\$1,708	\$710	\$998	\$6,543	\$1,903	\$4,640
1994	1,879	484	1,395	6,035	1,390	4,645
1995	2,805	444	2,361	6,630	1,065	5,565
1996	1,868	745	1,123	5,873	1,108	4,765
1997	2,009	477	1,532	5,568	1,023	4,545
1998	2,395	655	1,740	4,263	1,102	3,161
1999	3,896	687	3,209	6,182	1,017	5,165
2000	1,425	493	932	5,499	816	4,683
2001(b)	245	245	-	486	486	-
2002(b)	578	578	-	811	811	-
2003(b)	470	470	-	754	754	-
2004(b)	923	923	-	1,139	1,139	-
2005(b)	911	911	-	1,315	1,315	-
2006(b)	940	940	-	(D)	-	-
2007(b)	(D)	(D)	(D)	(D)	(D)	(D)

Source: U.S. Census Bureau, *Aerospace Industry (Orders, Sales, and Backlog)*.

a. Based on AIA's aerospace composite price deflator (2000=100).

b. Due to disclosure limitations, space propulsion units combined with space vehicle systems. See page 62.

D. Withheld by Census Bureau to avoid disclosing data for individual companies.

WORLDWIDE SPACE LAUNCHINGS^a
WHICH ATTAINED EARTH ORBIT OR BEYOND

Calendar Years 1957 – 2007

Country	Total: 1957- 2007	2003	2004	2005	2006	2007(b)
TOTAL	4,532	61	53	55	44	64
U.S.S.R. / C.I.S.	2,791	21	22	26	16	23
United States	1,351	26	19	16	15	18
European Space Agency	172	4	3	5	5	5
People's Republic of China	102	6	8	5	3	11
Japan	70	2	-	2	5	3
India	21	2	1	1	-	3
Israel	5	-	-	-	-	1
Other	20	-	-	-	-	-

Source: NASA, *Aeronautics and Space Report of the President*.

a. Number of launchings rather than spacecraft; some launches orbited multiple spacecraft.

b. Through September 30.

U.S. GOVERNMENT SPACECRAFT RECORD^a

Calendar Years 1957 – 2007

Year	Earth Orbit ^b		Earth Escape ^b		Year	Earth Orbit ^b		Earth Escape ^b	
	Success	Failure	Success	Failure		Success	Failure	Success	Failure
1957	0	1	0	0	1987	9	1	0	0
1958	5	8	0	4	1988	16	1	0	0
1959	9	9	1	2	1989	24	0	2	0
1960	16	12	1	2	1990	40	0	1	0
1961	35	12	0	2	1991(d)	32	0	0	0
1962	55	12	4	1	1992(d)	26	0	1	0
1963	62	11	0	0	1993(d)	28	1	1	0
1964	69	8	4	0	1994(d)	31	1	1	0
1965	93	7	4	1	1995(d)	24	2	1	0
1966	94	12	7	1(c)	1996(d)	30	1	3	0
1967	78	4	10	0	1997	22	0	1	0
1968	61	15	3	0	1998	23	0	2	0
1969	58	1	8	1	1999	35	4	2	0
1970	36	1	3	0	2000	31	0	0	0
1971	45	2	8	1	2001	23	0	3	0
1972	33	2	8	0	2002	18	0	0	1(c)
1973	23	2	3	0	2003	28	0	2	0
1974	27	2	1	0	2004	8	0	1	0
1975	30	4	4	0	2005	10	0	2	0
1976	33	0	1	0	2006	20	0	2	0
1977	27	2	2	0	2007(f)	9	2	2	0
1978	34	2	7	0	TOTAL	1,599	155	106	16
1979	18	0	0	0					
1980	16	4	0	0					
1981	20	1	0	0					
1982	21	0	0	0					
1983	31	0	0	0					
1984	35	3	0	0					
1985	37	1	0	0					
1986	11	4	0	0					

*(continues next column)*Source: NASA, *Aeronautics and Space Report of the President*.

- 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 judgment of mission success. "Escape" flights include all that were intended to go at least an altitude equal to the lunar distance from the Earth.
- c. This Earth-escape failure did attain Earth orbit and therefore is included in the Earth-orbit success totals.
- d. Excludes commercial satellites.
- f. Through September 30.

U.S. SPACE LAUNCH VEHICLES

As of 2008

Vehicle and Initial Launch and First Launch of This Modification	Stages	Thrust (Kilo-newtons)	Maximum Payload (Kg) ^a		
			200-Km LEO	Geo-synch. Transfer Orbit	Circular Sun-synch. Orbit
Atlas V (1966; 2002)	0. 0-5 Aerojet* 1. RD-180 2. 1-2 RL-10A-4	1,361 each 3,827 99.2 (SEC)/ 198.4 (DEC)	29,400**	12,100	NA
Delta II 7000 Series (1960; 1990)	0. 3, 4 or 9 GEM* 1. RS-27 2. AJ10-118K 3. Star 48B*	446 each 890 44 66	4,900 3,755	1,750	3,250
Delta IV Medium (1960; 2003)	1. RS-68 2. RL-10B-2	2,891 110	8,700 7,840	4,000	6,800
Delta IV Medium+ (1960; 2002)	0. 2 or 4 GEM* 1. RS-68 2. RL-10B-2	852 each 2,891 110	13,200 12,021	6,300	10,800
Delta IV Heavy (1960; 2004)	0. 2 RS-68 1. RS-68 2. RL-10B-2	5,962 2,891 110	23,000 22,184	12,600	20,800
Falcon 1 (2006)	1. Merlin 1C 2. Kestrel	347	400		150

(Continued on next page)

U.S. SPACE LAUNCH VEHICLES

As of 2008, Continued

Vehicle and Initial Launch and First Launch of This Modification	Stages	Thrust (Kilo-newtons)	Maximum Payload (Kg) ^a		
			200-Km LEO	Geo-synch. Transfer Orbit	Circular Sun-synch. Orbit
Falcon 9 (2009)	1. Merlin 1C 2. Merlin 1C	4,400	9,100	3,500	6,400**
Minotaur (2000)	1. MM55A1* 2. MSR-19* 3. Orion 50XL* 4. Orion 38*	792 263 196 36	550	—	350
Pegasus XL (1990; 1994 ^b)	1. Orion 50S-XL* 2. Orion 50-XL* 3. Orion 38*	721 196 36	450 340	—	200
Space Shuttle (reusable) (1981)	0. 3 main engines (SSMEs) fire in parallel with solid-fueled rocket boosters (SRBs) 1. 2 SRBs mounted on external tank (ET) fire in parallel with SSMEs 2. 2 OMS	5,578 23,575 53	24,900	—	—
Taurus XL (1994)	0. Castor 120* 1. Orion 50S-XL* 2. Orion 50-XL* 3. Orion 38*	1,904 704 196 36	1,550 1,240	—	950

Source: NASA, *Aeronautics and Space Report of the President*.

* Solid propellant; all others are liquid.

** Estimated performance based on non-contractual data.

a. Due east launch except as indicated.

b. First launch was a failure.

FEDERAL SPACE ACTIVITIES BUDGET AUTHORITY

Fiscal Years 1980 – 2009
(Millions of Dollars)

Year	TOTAL	NASA^a	DoD	Commerce	Energy	Other^b
1980	\$8,759	\$4,680	\$3,848	\$93	\$40	\$98
1981	10,054	4,992	4,828	87	41	106
1982	12,520	5,528	6,679	145	61	107
1983	15,674	6,328	9,019	178	39	110
1984	17,448	6,858	10,195	236	34	125
1985	20,277	6,925	12,768	423	34	127
1986	21,768	7,165	14,126	309	35	133
1987	26,562	9,809	16,287	278	48	140
1988	26,742	8,322	17,679	352	241	148
1989	28,563	10,097	17,906	301	97	162
1990	27,582	11,460	15,616	243	79	184
1991	27,999	13,046	14,181	251	251	270
1992	29,020	13,199	15,023	327	223	248
1993	27,901	13,064	14,106	324	165	242
1994	26,820	13,022	13,166	312	74	246
1995	23,946	12,543	10,644	352	60	347
1996	24,911	12,569	11,514	472	46	310
1997	24,973	12,457	11,727	448	35	306
1998	25,519	12,321	12,359	435	103	301
1999	26,644	12,459	13,203	575	105	302
2000	26,518	12,521	12,941	575	164	317
2001	28,692	13,304	14,326	577	145	340
2002	30,807	13,871	15,740	644	169	383
2003	35,053	14,360	19,388	649	191	465
2004	34,901	14,322	19,115	745	209	510
2005	36,475	15,234	19,690	807	229	515
2006	39,526	15,765	22,114	860	245	542
2007	39,666	15,568	22,418	912	200	568
2008(E)	44,134	16,502	25,949	862	195	626
2009(E)	45,652	17,167	26,528	1,089	203	665

Source: NASA, *Aeronautics and Space Report of the President*.

a. Excludes amounts for air transportation.

b. Departments of Interior, Transportation, and Agriculture; the National Science Foundation; and the Environmental Protection Agency.

E. Estimate.

FEDERAL SPACE ACTIVITIES OUTLAYS

Fiscal Years 1978 – 2007
(Millions of Dollars)

Year	TOTAL	NASA^a	DoD	Commerce	Energy	Other^b
1978	\$6,188	\$3,582	\$2,457	\$101	\$29	\$20
1979	6,808	3,744	2,892	97	55	21
1980	7,734	4,340	3,162	89	49	94
1981	9,238	4,877	4,131	81	47	102
1982	10,542	5,463	4,772	142	60	106
1983	12,668	6,101	6,247	178	40	103
1984	14,813	6,461	8,000	209	33	109
1985	17,353	6,607	10,441	155	34	115
1986	18,683	6,756	11,449	317	35	127
1987	21,948	7,254	14,264	262	37	130
1988	23,521	8,451	14,397	334	199	140
1989	25,255	10,195	14,504	306	97	153
1990	25,788	12,292	12,962	279	79	177
1991	28,484	13,351	14,432	266	251	184
1992	27,998	12,838	14,437	298	223	202
1993	27,537	13,092	13,779	295	165	206
1994	23,929	12,363	10,973	297	83	213
1995	24,700	12,593	11,494	330	70	213
1996	24,675	12,694	11,353	354	46	228
1997	25,620	13,055	11,959	336	37	233
1998	25,827	12,866	12,230	326	97	308
1999	25,771	12,466	12,453	431	103	318
2000	26,633	12,427	13,207	517	165	317
2001	27,226	13,197	13,046	525	143	315
2002	29,465	13,449	14,906	579	170	361
2003	33,321	13,553	18,612	579	191	386
2004	33,371	14,270	17,776	670	202	453
2005	35,838	14,747	19,662	727	223	479
2006	35,846	14,403	19,959	780	243	461
2007	38,830	15,247	22,060	820	188	515

Source: NASA, *Aeronautics and Space Report of the President*.

a. Excludes amounts for air transportation.

b. Departments of Interior, Transportation, and Agriculture; the National Science Foundation; and the Environmental Protection Agency.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION BUDGET AUTHORITY

Fiscal Years 1986 – 2009
(Millions of Dollars)

Year	TOTAL	Research and Development	Space Flight Control and Communications	Construction of Facilities	Research and Program Management ^a
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	12,111	5,225	4,645	218	2,023
1991	14,005	6,024	5,271	498	2,212
1992	14,301	6,848	5,352	525	1,576
1993	14,310	7,074	5,059	526	1,652
1994	14,570	7,534	4,835	493	1,708

Year	TOTAL	Science, Aeronautics, & Technology	Human Space Flight	Other ^a	Mission Support
1995(b)	\$13,854	\$5,936	\$5,515	(\$130)	\$2,533
1996	13,886	5,929	5,457	17	2,483
1997	13,711	5,590	5,540	19	2,562
1998	13,649	5,690	5,560	19	2,380
1999	13,655	5,654	5,480	21	2,500
2000	13,602	5,582	5,488	21	2,511
2001	14,361	6,235	5,496	28	2,602
2002(c)	14,893	8,095	6,773	25	-
2003	15,391	9,215	6,149	27	-

Year	TOTAL	Exploration, Science, & Aeronautics	Exploration Capabilities	Other ^a	Mission Support
2004	\$15,379	\$7,873	\$7,478	\$28	-
2005	16,198	7,891	8,275	31	-
2006	16,273	9,721	6,520	32	-
2007	16,264	9,545	6,146	573	-
2008(E)	17,118	10,030	6,734	354	-
2009(E)	17,614	8,388	5,775	3,451	-

Source: Office of Management and Budget, *Budget of the United States Government*.

a. Includes trust funds, Office of the Inspector General, National Space Grant Program, and GSA building delegation.

b. 1995 features major budget account restructuring.

c. Mission Support, as a separate category, discontinued; funds merged into other categories.

E. Estimate.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION OUTLAYS

Fiscal Years 1994 – 2009
(Millions of Dollars)

Year	TOTAL	Research and Development	Space Flight Control and Communications ^a	Construction of Facilities	Research and Program Management ^b
1994	\$13,695	\$6,758	\$4,899	\$371	\$1,666
1995(c)	5,098	3,286	1,409	305	98
1996(c)	1,022	510	241	265	6
1997(c)	317	101	92	122	2
1998(c)	138	40	34	64	0
1999(c)	47	18	2	27	0
2000(c)	31	18	1	12	0

Year	TOTAL	Science, Aeronautics, & Technology	Human Space Flight	Other ^b	Mission Support
1995(c)	\$8,280	\$2,708	\$3,528	\$15	\$2,029
1996(c)	12,858	5,017	5,452	16	2,373
1997(c)	14,043	5,891	5,656	19	2,477
1998(c)	14,068	6,015	5,551	19	2,483
1999(c)	13,617	5,785	5,417	20	2,395
2000(c)	13,411	5,477	5,497	21	2,416
2001(d)	14,199	5,752	5,829	32	2,586
2002(f)	14,430	7,532	6,337	27	534
2003(f)	14,552	8,358	6,034	25	135
2004(f,g)	5,826	3,944	1,842	-	40
2005(f,g)	884	667	198	-	19

Year	TOTAL	Exploration, Science, & Aeronautics	Exploration Capabilities	Office of Inspector General	Other ^h
2004(g)	\$15,152	\$4,115	\$5,218	\$32	\$5,787
2005(g)	15,602	6,957	7,743	28	874
2006	15,125	7,853	7,117	33	122
2007	15,861	9,303	6,375	32	151
2008(E)	17,318	10,427	6,836	33	22
2009(E)	18,137	10,400	6,061	36	1,640

Source: Office of Management and Budget, *Budget of the United States Government*.

a. Separate budget category beginning in 1984; funds formerly included under Research and Development.

b. Includes trust funds, Office of Inspector General, National Space Grant Program, & GSA building delegation.

c. 1995 featured major budget account restructuring; 1995–2000 outlays split between old and new account structure.

d. Continuing minimal outlays reported under old account structure included under Other beginning in 2001.

e. Estimate.

f. Mission Support, as a separate category, is being discontinued; funds merged into other categories.

g. 2004 featured another budget account restructuring; 2004–2005 outlays split between old and new account structure.

h. In FY 2004, NASA again restructured accounts. Outlays authorized under old accounts but expended in later years are shown here, along with a few miscellaneous programs and accounts.

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

**Fiscal Years 2007 – 2009
(Millions of Dollars)**

	2007	2008	2009
	Actual	Estimate	Estimate
TOTAL	\$16,285	\$17,310	\$17,617
Science, Aeronautics and Exploration:	<u>\$11,024</u>	<u>\$11,604</u>	<u>\$11,690</u>
Science	4,610	4,706	4,442
Exploration Systems	2,870	3,143	3,501
Aeronautics Research	594	512	447
Cross-Agency Support Programs	2,950	3,243	3,300
Exploration Capabilities:	<u>\$5,113</u>	<u>\$5,526</u>	<u>\$5,775</u>
Space Operations:	<u>\$5,113</u>	<u>\$5,526</u>	<u>\$5,775</u>
Space Shuttle	3,315	3,267	2,982
International Space Station	1,469	1,813	2,060
Space and Flight Support	329	446	733
Education	\$116	\$147	\$116
Inspector General	\$32	\$33	\$36

Source: NASA, FY 2009 Budget Estimates.

**DEPARTMENT OF DEFENSE SPACE PROGRAMS
PROCUREMENT AND RDT&E**

**Fiscal Years 2007, 2008, and 2009
(Millions of Dollars)**

Agency and Program	2007		2008(E)		2009(E)	
	Procurement	RDT&E	Procurement	RDT&E	Procurement	RDT&E
AIR FORCE						
AEHF	\$ -	\$617.3	\$132.1	\$599.4	\$16.6	\$388.0
Defense Space Recon Pgm	213.4	-	183.0	-	159.0	-
Defense Support Program	75.8	-	-	-	-	-
DMSP	106.4	0.9	125.8	-	99.8	-
EELV	852.1	19.1	1,091.8	-	1,205.3	33.7
Global Positioning System	90.3	582.4	221.8	756.5	136.0	946.5
Medium Launch Vehicles	91.3	-	116.9	-	5.8	-
MILSATCOM (DISA)	75.3	257.2	117.6	384.7	106.3	337.1
NPOESS	-	343.3	-	332.5	-	289.5
NUDET Detection System	12.8	59.9	16.3	38.3	27.6	41.3
Satellite Control Network	72.0	21.2	49.7	26.9	65.4	16.8
SBIRS-High	-	677.9	-	583.3	1,164.0	529.8
Space Test Program (STP)	-	48.8	-	47.1	-	48.1
Space Radar (SR) System	(a)	183.2	(a)	(a)	(a)	(a)
Spacelift Range System	117.3	45.6	121.3	27.1	102.0	12.4
Titan Space Boosters	25.9	-	36.2	-	-	-
TSAT	-	700.4	-	804.7	-	843.0
Wideband Gapfiller Satellite	361.8	44.0	322.3	19.1	22.5	12.4
ARMY						
NAVSTAR GPS	\$121.3	\$ -	\$110.9	\$ -	\$103.2	\$ -
NAVY						
MUOS	\$ -	\$645.9	\$214.4	\$598.2	\$507.5	\$516.8
Satellite Communications	36.3	728.5	63.6	724.8	122.0	652.5

Source: Department of Defense: *Program Acquisition Costs by Weapon System, Procurement Programs (P-1), and RDT&E Programs (R-1)*.

a. Classified funding.

E. Estimate.

Key: AEHF = Advanced Extremely High Frequency

DMSP = Defense Meteorological Satellite Program

DSCS = Defense Satellite Communications System

EELV = Evolved Expendable Launch Vehicle

GPS = Global Positioning System

MUOS = Mobile User Objective System

NPOESS = National Polar-orbiting Operational Environmental Satellite System

NUDET = Nuclear Detonation

SBIRS = Space-Based InfraRed System

TSAT = Transformational Satellite Communications System

ORDERS AND BACKLOG OF COMMERCIAL^a GEOSYNCHRONOUS SATELLITES BY MANUFACTURER^b

Calendar Years 2004 – 2007

	2004	2005	2006	2007
ORDERS				
Estimated Value^c (millions)	\$1,346	\$2,578	\$4,425	\$2,585
Number of Satellites—TOTAL	8	24	26	21
Thales Alenia Space	2	3	5	2
Boeing Satellite Systems	3	-	3	-
Chinese Academy of Space Tech.	-	3	-	-
EADS Astrium	1	2	7	7
Israel Aircraft Industries	-	1	-	1
Khrunichev	-	1	3	-
LMCSS	1	4	1	1
MELCO	-	1	-	-
Orbital Sciences	-	4	1	5
RSC Energia	-	-	-	-
Space Systems Loral	1	5	6	5
BACKLOG^d				
Estimated Value^c (millions)	\$9,240	\$10,120	\$10,670	\$10,890
Number of Satellites—TOTAL	84	92	97	99
Thales Alenia Space	16	19	22	20
Boeing Satellite Systems	15	12	13	10
Chinese Academy of Space Tech.	2	5	5	5
EADS Astrium	11	10	14	20
Israel Aircraft Industries	-	1	-	1
Khrunichev	2	1	4	4
LMCSS	12	16	12	8
MELCO	-	1	-	-
Orbital Sciences	5	6	6	10
RSC Energia	2	2	-	-
Space Systems Loral	19	19	21	21

Source: Futron Corporation.

a. Satellites primary used for commercial service.

b. Excludes canceled orders and orders on hold, without firm funding or business commitment, or with extended construction delay.

c. Estimated using best available public information; where not available, Futron estimates used.

d. Includes satellites on order during year.

ORDERS AND BACKLOG OF COMMERCIAL LAUNCH CONTRACTS BY PROVIDER-COUNTRY

Calendar Years 2004 – 2007

	2004	2005	2006	2007
ORDERS^a				
Total:	<u>27</u>	<u>32</u>	<u>33</u>	<u>49</u>
China	3	3	1	1
India	1	-	-	-
Japan	-	-	-	-
Russia	2	7	4	19
United States	10	6	9	6
Europe	9	11	10	21
Other multinational ^b	2	5	9	2
BACKLOG^a				
Total:	<u>195</u>	<u>202</u>	<u>200</u>	<u>215</u>
China	8	11	9	10
India	2	2	1	12
Japan	-	-	-	4
Russia	31	33	28	38
United States	93	95	92	78
Europe	46	45	50	53
Other multinational ^b	15	16	20	20

Source: Futron Corporation.

a. Includes announced government payloads.

b. Sea Launch and Land Launch.

AIR TRANSPORTATION



B-747 Takeoff (Boeing Photo)

By most measures, 2007 was a prosperous year for airlines around the world, with operating revenues up \$42.7 billion (9.2 percent) to nearly \$508 billion. Airlines continued to improve the efficiency of their operations in 2007, yielding worldwide operating profits of \$19.7 billion, which

represented 3.9 percent of operating revenues. Both the passenger and freight transportation sectors experienced solid growth. Air carriers had record high load factors, with passenger traffic growing 6 percent, while the amount of air freight carried rose 4 percent.

U.S. airlines marked their third consecutive year of positive operating results in 2007, reaching a near-record \$9.2 billion. Overall, results have consistently improved since the industry's \$10.3 billion loss in 2001. While higher-fare international operations remained more profitable than domestic routes in 2007, both categories registered gains.

Fuel costs remained a top issue for air carriers in 2007. U.S. air carriers consumed almost \$34 billion of jet fuel in 2007, with an average cost per gallon of \$2.05. The cost of fuel as a percent of cash operating expenses reached its highest level since the years following the 1979 energy crisis. Fuel costs hit a record high over the summer in 2008, leading airlines to aggressively restructure their operations. However, by December 2008, jet fuel prices had dropped to below half their summer-time peak, easing some difficulties. Even so, the continued volatility of worldwide oil markets remains a major concern



Citation X (Courtesy Cessna)

for airlines, as it makes fleet-planning and flight-management considerably more difficult.

The world airline fleet reached 28,126 aircraft in 2007, an increase of 3 percent. The fleet included 13,726 U.S.-manufactured jets, up 239 from the previous year. Such aircraft represented almost 49 percent of the 2007 world airline fleet. Other major manufacturers included Europe, Russia, Brazil, and Canada. The United States also remained the top player in the turbojet engine market, with U.S. engine exports accounting for well over 50 percent of the world airline market share.

Based on the latest available data (2006) for U.S. general aviation, the number of active aircraft decreased slightly to 221,900, with fixed-wing, piston, single-engine aircraft accounting for the most retirements. Broken down by primary use, business and personal aircraft had the most retirements. Although more aircraft were retired in 2006 than in 2005, pilots spent more time in the air, resulting in an across the board increase in the number of flight hours. Of the various uses tracked, instructional flight registered the largest increase in number of hours flown. This is also a leading indicator for future growth of overall flight hours.



Legacy 600 (Embraer Photo)

The U.S. civil aviation market has grown tremendously in recent years on the strength of global economic expansion, world trade, and the competitiveness and innovation of the U.S. industry. However, airlines worldwide are facing an increasingly challenging business environment, marked

by a slowing world economy, high oil prices, and in some markets, slowing traffic growth. Airlines responded by reducing capacity and increasing ticket prices, and while such strategies did improve their positions, market indicators portend weakening demand for air transportation.

Both international and domestic passenger traffic have retreated in recent months, with the global economic instability affecting even previously booming markets such as China and the Middle East. Air transportation, historically correlated with economic growth, is clearly poised for long term expansion, both in the United States and abroad. However, the near future may bring difficult times for airlines as passenger demand weakens and fuel costs remain volatile.

Already, airlines have tempered plans for fleet replacement and expansion, as evidenced by a significant drop in new aircraft orders and an increase in the number of delivery deferments. Orders began to slow in early 2008, and as the year progressed, rapidly deteriorating market conditions hastened the decline.



B-777 on Runway (Boeing Photo)

Slumping corporate profits and customer financing problems have reduced short term demand for business jets. Large civil aircraft have also been affected, with airlines facing tighter credit terms. However, aircraft backlogs provide a measure of longer-term optimism for the industry; Boeing alone has a backlog approximately seven times its current production rate.

OPERATING REVENUES, EXPENSES, AND RESULTS OF WORLD SCHEDULED AIRLINES

Calendar Years 2004 – 2007
(Millions of Dollars)

	2004	2005	2006	2007(P)
OPERATING REVENUES:				
Scheduled Services:				
Passenger	\$285,970	\$314,430	\$355,910	NA
Freight	40,180	42,150	46,710	
Mail	2,270	2,070	2,320	
Excess baggage	-	1,540	1,360	
Total	\$328,420	\$360,190	\$406,300	
Non-Scheduled Services	\$11,740	\$10,340	\$12,100	
Incidental	38,600	42,770	46,760	
Total	\$378,760	\$413,300	\$465,160	\$507,870
OPERATING EXPENSES:				
Flight Operations	\$125,800	\$154,190	\$176,050	NA
Maintenance & Overhaul	39,430	41,720	45,010	
Depreciation & Amortization	23,660	24,950	26,560	
User Charges & Station Expenses	61,970	66,260	72,920	
Passenger Services	36,420	38,040	40,070	
Ticketing, Sales, & Promotion	36,430	37,220	39,620	
General, Administrative, & Other	51,970	46,620	49,980	
Total	\$375,680	\$409,000	\$450,210	\$488,210
OPERATING RESULT	\$3,080	\$4,300	\$14,950	\$19,660
Percent of Revenue	0.8%	1.0%	3.2%	3.9%
NET RESULT(a)	(\$5,670)	(\$4,100)	\$4,990	\$14,530
Percent of Revenue	-1.5%	-1.0%	1.1%	2.9%

Source: International Civil Aviation Organization, *Civil Aviation Statistics of the World*.

a. Net Result equals Operating Result minus non-operating items, including interest, income taxes, retirement of property and equipment, affiliated companies, and subsidiaries.

P. Preliminary.

NA. Not available.

OPERATING REVENUES AND EXPENSES OF U.S. AIR CARRIERS^a **DOMESTIC AND INTERNATIONAL OPERATIONS**

Calendar Years 1983 – 2007
(Millions of Dollars)

Year	TOTAL			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)
1983	\$38,177	\$37,879	\$299	\$31,014	\$31,186	(\$171)	\$7,163	\$6,693	\$470
1984	43,369	41,297	2,072	35,394	33,812	1,582	7,975	7,485	490
1985	45,931	44,595	1,337	37,629	36,611	1,018	8,302	7,984	319
1986	49,622	48,442	1,223	41,001	39,984	1,060	8,621	8,458	163
1987	56,583	54,151	2,431	45,658	43,925	1,733	10,925	10,226	698
1988	63,589	60,142	3,446	50,187	47,739	2,448	13,402	12,403	998
1989	69,225	67,413	1,812	54,314	52,460	1,855	14,911	14,954	(43)
1990	75,984	77,898	(1,913)	57,994	58,983	(989)	17,990	18,914	(924)
1991	75,158	76,943	(1,785)	56,230	56,758	(528)	18,928	20,185	(1,257)
1992	78,140	80,585	(2,444)	57,654	58,801	(1,147)	20,486	21,784	(1,298)
1993	84,559	83,121	1,438	63,233	61,157	2,076	21,326	21,964	(637)
1994	88,313	85,600	2,713	65,949	63,758	2,191	22,364	21,842	522
1995	94,318	88,455	5,863	70,885	66,120	4,765	23,433	22,335	1,098
1996	101,937	95,728	6,209	76,891	71,573	5,317	25,047	24,155	892
1997	109,568	100,981	8,587	82,250	75,731	6,518	27,318	25,250	2,068
1998	113,465	104,137	9,328	86,494	78,389	8,105	26,971	25,749	1,223
1999	119,038	110,635	8,403	90,931	84,328	6,603	28,107	26,307	1,800
2000	130,299	123,314	6,985	98,896	93,579	5,317	31,403	29,736	1,668
2001	115,227	125,550	(10,323)	86,511	94,892	(8,380)	28,716	30,658	(1,943)
2002	106,702	115,260	(8,557)	79,220	86,697	(7,476)	27,482	28,563	(1,081)
2003	117,728	119,824	(2,096)	88,830	91,484	(2,654)	28,898	28,340	558
2004	134,296	135,778	(1,482)	100,811	104,353	(3,542)	33,486	31,425	2,061
2005	151,255	150,828	427	111,730	113,764	(2,034)	39,524	37,064	2,461
2006	164,913	157,400	7,513	120,330	116,188	4,142	44,583	41,212	3,371
2007	173,719	164,503	9,216	124,118	119,786	4,332	49,601	44,717	4,884

Source: Department of Transportation, Office of Airline Information, *Air Carrier Financial Statistics Quarterly*.

a. Scheduled and non-scheduled service for all certificated route air carriers. Excludes supplemental air carriers, commuters, and air taxis.

SOURCES OF OPERATING REVENUES OF U.S. AIR CARRIERS^a **DOMESTIC AND INTERNATIONAL OPERATIONS**

Calendar Years 1993 – 2007
(Millions of Dollars)

Year	TOTAL	Passenger Service ^b	Mail	Freight ^b & Air Express	Excess Baggage	Other ^c
DOMESTIC OPERATIONS						
1993	\$63,233	\$49,289	\$974	\$5,266	\$91	\$7,612
1994	65,949	50,504	971	5,844	98	8,531
1995	70,885	53,971	1,050	6,546	92	9,227
1996	76,891	59,381	1,024	7,029	94	9,362
1997	82,250	62,549	1,087	7,497	99	11,017
1998	86,494	64,847	1,423	7,711	105	12,408
1999	90,931	67,777	1,475	8,053	118	13,509
2000	98,896	74,744	1,688	8,804	123	13,537
2001	86,511	64,324	824	8,170	111	13,082
2002	79,220	57,871	431	8,148	132	12,638
2003	88,830	62,442	545	8,983	201	16,660
2004	100,811	67,284	443	10,691	219	22,173
2005	111,730	72,142	318	12,530	263	26,476
2006	120,330	77,092	405	13,514	341	28,979
2007	124,118	79,384	269	14,342	357	29,764
INTERNATIONAL OPERATIONS						
1993	\$21,326	\$15,915	\$237	\$3,220	\$49	\$1,905
1994	22,364	16,300	212	3,606	46	2,201
1995	23,433	16,788	216	3,994	48	2,387
1996	25,047	17,337	255	4,664	47	2,743
1997	27,318	18,320	275	5,156	56	3,511
1998	26,971	17,667	285	5,278	50	3,692
1999	28,107	18,011	264	5,921	46	3,865
2000	31,403	20,419	283	6,566	47	4,089
2001	28,716	18,227	240	6,444	42	3,763
2002	27,482	17,105	228	7,127	48	2,975
2003	28,898	17,253	358	8,206	58	3,023
2004	33,486	20,788	257	8,851	67	3,522
2005	39,524	23,891	405	10,651	79	4,499
2006	44,583	26,502	528	11,810	100	5,641
2007	49,601	29,724	438	12,356	107	6,976

Source: Department of Transportation, Office of Airline Information, *Air Carrier Financial Statistics Quarterly*.

a. Scheduled and non-scheduled service for all certificated route air carriers. Excludes supplemental air carriers, commuters, and air taxis.

b. Scheduled and charter.

c. Includes subsidy, reservation cancellation fees, miscellaneous operating revenues, and other transport-related revenues.

OPERATING EXPENSES OF U.S. AIR CARRIERS^a **DOMESTIC AND INTERNATIONAL OPERATIONS**

Calendar Years 1993 – 2007
(Millions of Dollars)

Year	TOTAL	Flying Operations	Main- tenance	Passen- ger Service	Aircraft & Traffic Serv- icing	Promo- tion and Sales	Depre- ciation & Amorti- zation	Other ^b
DOMESTIC OPERATIONS								
1993	\$61,157	\$17,622	\$7,025	\$5,241	\$10,172	\$9,387	\$3,621	\$8,089
1994	63,758	17,912	7,312	5,305	10,543	9,882	3,782	9,023
1995	66,120	18,926	7,656	5,281	11,103	9,974	3,762	9,417
1996	71,573	21,515	8,292	5,577	11,569	10,414	3,878	10,328
1997	75,731	22,156	9,475	5,854	12,058	10,780	3,940	11,469
1998	78,389	21,044	10,311	6,252	12,699	10,743	4,144	13,195
1999	84,328	22,820	11,161	6,763	13,796	10,760	4,657	14,372
2000	93,579	28,565	12,062	7,355	14,827	10,089	5,122	15,558
2001	94,892	27,908	12,113	7,219	15,390	8,949	6,230	17,081
2002	86,697	25,924	11,069	7,049	14,853	6,703	4,989	16,109
2003	91,484	28,339	10,369	6,499	15,245	6,299	5,028	19,704
2004	104,353	34,016	11,071	6,604	15,580	6,372	5,096	25,614
2005	113,764	39,805	11,466	6,317	15,671	6,369	5,038	29,099
2006	116,188	42,727	11,609	5,798	15,469	6,113	5,056	29,417
2007	119,786	44,136	12,267	5,908	16,191	6,143	5,131	30,010
INTERNATIONAL OPERATIONS								
1993	\$21,964	\$5,928	\$1,967	\$2,175	\$3,072	\$5,339	\$1,077	\$2,406
1994	21,842	5,842	2,064	2,311	3,336	4,335	1,237	2,716
1995	22,335	6,181	2,273	2,467	3,748	3,527	1,106	3,033
1996	24,155	7,279	2,616	2,596	3,736	3,354	1,483	3,091
1997	25,250	7,462	2,899	2,736	3,823	3,476	1,281	3,571
1998	25,749	7,158	2,955	2,920	3,978	3,374	1,438	3,926
1999	26,307	7,472	2,902	3,067	4,207	3,201	1,614	3,845
2000	29,736	9,504	3,093	3,211	4,565	3,282	1,751	4,329
2001	30,658	9,652	3,196	3,254	4,599	2,828	2,168	4,960
2002	28,563	9,202	3,125	3,090	4,573	2,233	1,923	4,417
2003	28,340	9,805	3,294	2,741	4,456	1,959	1,748	4,337
2004	31,425	11,579	3,438	2,911	4,961	2,225	1,799	4,512
2005	37,064	15,172	3,994	3,006	5,613	2,281	1,734	5,264
2006	41,212	17,066	4,287	2,960	5,852	2,305	1,875	6,867
2007	44,717	18,351	4,470	3,047	6,187	2,414	1,984	8,265

Source: Department of Transportation, Office of Airline Information, *Air Carrier Financial Statistics Quarterly*.

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.

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

Calendar Years 1978 – 2007
(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	Net Value as a Percent of Total Assets
1978	\$20,745	\$16,127	\$3,367	\$8,799	\$10,696	51.6%
1979	24,907	18,561	3,985	9,746	12,800	51.4
1980	28,900	20,859	4,682	10,309	15,233	52.7
1981	30,513	22,375	5,175	11,028	16,521	54.1
1982	31,525	23,786	5,424	11,405	17,804	56.5
1983	35,213	26,588	6,191	12,910	19,868	56.4
1984	36,769	28,509	6,061	14,043	20,527	55.8
1985	40,978	30,402	6,772	15,467	21,707	53.0
1986	47,105	31,750	8,468	14,764	25,454	54.0
1987	51,436	33,177	9,223	15,580	26,820	52.1
1988	56,047	35,781	10,248	17,450	28,579	51.0
1989	62,454	38,812	11,903	19,018	31,697	50.8
1990	67,769	40,215	13,523	20,593	33,144	48.9
1991	70,332	42,897	14,285	22,009	35,173	50.0
1992	75,426	48,563	15,219	24,445	39,337	52.2
1993	82,399	51,513	15,438	24,949	42,003	51.0
1994	84,442	51,951	15,844	26,476	41,319	48.9
1995	89,782	56,018	16,804	29,056	43,766	48.7
1996	95,184	59,206	16,661	30,029	45,838	48.2
1997	105,226	66,523	17,643	32,789	51,377	48.8
1998	118,308	75,385	19,980	35,992	59,373	50.2
1999	133,711	86,269	21,826	39,060	69,035	51.6
2000	146,300	98,404	22,095	41,880	78,620	53.7
2001	158,516	103,508	23,092	42,666	83,934	52.9
2002	158,186	106,297	24,224	44,366	86,155	54.5
2003	166,899	109,429	23,451	44,577	88,303	52.9
2004	165,116	115,006	24,320	48,468	90,858	55.0
2005	167,830	115,582	25,987	51,620	89,950	53.6
2006	178,070	115,926	23,391	48,188	91,129	51.2
2007	205,228	111,026	21,301	38,776	93,551	45.6

Source: Department of Transportation, Office of Airline Information, *Air Carrier Financial Statistics Quarterly*.

a. Includes land and construction in progress.

TRAFFIC STATISTICS: WORLD AIRLINE SCHEDULED SERVICE^a

Calendar Years 1978 – 2007

Year	Passen- gers Carried	Freight Tons Carried	Passen- ger- Miles Per- formed	Seat- Miles Avail- able	Passen- ger Load Factor	Ton-Miles Performed		
						Total ^b	Freight	Mail
	(Millions)		(Billions)		(Percent)	(Billions)		
1978	679	11.7	582	902	65%	77.77	17.77	2.24
1979	754	12.1	659	999	66	86.89	19.19	2.35
1980	748	12.2	677	1,071	63	89.72	20.12	2.52
1981	752	12.0	695	1,092	64	92.81	21.15	2.60
1982	766	12.8	710	1,115	64	94.84	21.60	2.65
1983	798	13.5	739	1,151	64	100.28	24.05	2.74
1984	848	14.8	794	1,226	65	109.05	27.17	2.95
1985	899	15.1	850	1,293	66	114.86	27.29	3.01
1986	960	16.2	902	1,389	65	122.47	29.58	3.11
1987	1,028	17.7	988	1,471	67	134.57	33.10	3.22
1988	1,082	19.0	1,060	1,568	68	145.29	36.48	3.31
1989	1,109	19.9	1,102	1,621	68	152.73	39.14	3.46
1990	1,165	20.3	1,177	1,740	68	161.12	40.27	3.65
1991	1,135	19.3	1,147	1,727	66	158.04	40.11	3.48
1992	1,146	19.5	1,199	1,821	66	165.86	42.90	3.51
1993	1,142	19.9	1,211	1,873	65	171.67	46.88	3.58
1994	1,233	22.6	1,305	1,969	66	187.29	52.89	3.71
1995	1,304	24.5	1,397	2,087	67	201.34	56.94	3.86
1996	1,391	25.6	1,511	2,215	68	217.24	61.10	3.97
1997	1,457	29.1	1,599	2,316	69	235.75	70.47	4.10
1998	1,471	29.2	1,633	2,385	68	238.77	69.74	3.95
1999	1,562	31.0	1,738	2,517	69	253.72	74.43	3.92
2000	1,672	33.5	1,887	2,663	71	276.69	80.88	4.14
2001	1,640	31.8	1,833	2,654	69	265.86	75.89	3.64
2002	1,639	34.6	1,842	2,589	71	272.01	82.08	3.13
2003	1,691	36.9	1,876	2,627	71	279.23	86.14	3.10
2004	1,888	40.8	2,141	2,923	73	314.33	95.23	3.14
2005	2,022	41.9	2,313	3,092	75	334.16	97.62	3.19
2006	2,128	44.1	2,449	3,229	76	352.58	102.50	3.12
2007(P)	2,260	45.9	2,610	3,408	77	373.34	108.49	3.10

Source: International Civil Aviation Organization (ICAO).

a. Includes international and domestic traffic on scheduled service performed by the airlines of the 189 states which were members of ICAO in 2007.

b. Passengers and baggage, and freight and mail.

P. Preliminary.

**TRAFFIC STATISTICS:
U.S. AIR CARRIER SCHEDULED SERVICE^a**
Calendar Years 1978 – 2007

Year	Revenue Ton-Miles (Millions)			Total Available Ton-Miles (Millions)	Total Revenue Load Factor (Percent)	Aircraft Revenue Miles (Millions)	Average Overall Flight Stage Length (Miles)	Average Available Seats per Aircraft Mile
	Total	Passen- ger	Cargo ^b					
1978	29,679	22,678	7,001	54,765	54.2%	2,520	502	152
1979	33,390	26,202	7,189	60,844	54.9	2,791	517	154
1980	32,603	25,519	7,084	62,983	51.8	2,816	526	158
1981	31,949	24,889	7,060	61,186	52.2	2,703	519	161
1982	32,850	25,964	6,886	62,401	52.6	2,699	544	167
1983	35,756	28,183	7,573	65,385	54.7	2,809	558	169
1984	38,697	30,512	8,185	72,223	53.6	3,134	575	168
1985	41,329	33,640	7,689	76,059	54.3	3,320	569	168
1986	45,681	36,655	9,026	85,140	53.7	3,725	580	168
1987	50,469	40,453	10,016	92,209	54.7	3,988	606	167
1988	53,800	42,330	11,469	97,899	55.0	4,141	618	169
1989	55,458	43,271	12,187	100,082	55.4	4,193	633	169
1990	58,342	45,793	12,549	107,559	54.2	4,491	649	170
1991	56,925	44,795	12,130	105,599	53.9	4,416	651	169
1992	61,054	47,855	13,199	112,749	54.2	4,661	661	169
1993	63,088	48,968	14,120	115,473	54.6	4,846	669	166
1994	67,989	51,938	16,052	120,798	56.3	5,033	668	163
1995	70,987	54,066	16,921	126,154	56.3	5,293	657	160
1996	75,621	57,866	17,754	131,381	57.6	5,501	668	160
1997	80,852	60,342	20,510	137,544	58.8	5,659	696	160
1998	82,304	61,809	20,496	141,722	58.1	5,838	704	159
1999	86,817	65,205	21,613	149,561	58.0	6,168	715	157
2000	93,163	69,276	23,888	159,441	58.4	6,574	728	154
2001	87,173	65,170	22,003	158,975	54.8	6,514	745	143
2002	88,701	64,110	24,591	158,795	55.9	6,556	755	136
2003	92,361	65,627	26,734	165,352	55.9	7,037	681	137
2004	101,346	73,368	27,978	171,650	59.0	7,658	668	136
2005	105,938	77,901	28,037	178,969	59.2	7,920	682	136
2006	109,019	79,680	29,339	179,454	60.8	7,917	702	137
2007	112,416	82,849	29,567	184,759	60.8	8,104	723	137

Source: Department of Transportation, Office of Airline Information, *Air Carrier Traffic Statistics Monthly*.

a. Includes international and domestic operations.

b. Includes freight, air express, U.S. and foreign mail.

**PASSENGER STATISTICS:
U.S. AIR CARRIER SCHEDULED SERVICE,
DOMESTIC AND INTERNATIONAL OPERATIONS**
Calendar Years 1993 – 2007

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					
1993	443,172	799	354,177	571,489	62.0%
1994	481,755	787	378,990	585,438	64.7
1995	499,000	791	394,708	603,917	65.4
1996	530,708	802	425,596	626,389	67.9
1997	542,001	817	442,640	640,319	69.1
1998	559,653	812	454,430	649,362	70.0
1999	582,880	824	480,134	687,502	69.8
2000	610,601	833	508,403	714,454	71.2
2001	570,125	843	480,348	695,200	69.1
2002	560,107	850	476,004	676,949	70.3
2003	589,135	848	499,632	687,850	72.6
2004	640,698	862	551,937	741,677	74.4
2005	670,418	865	579,690	752,482	77.0
2006	671,796	871	585,391	740,909	79.0
2007	692,852	871	603,623	756,648	79.8
INTERNATIONAL OPERATIONS					
1993	45,348	2,988	135,508	200,151	67.7%
1994	47,093	2,981	140,391	198,893	70.6
1995	48,773	2,992	145,948	203,160	71.8
1996	50,526	3,029	153,067	208,682	73.3
1997	52,724	3,049	160,779	216,913	74.1
1998	53,232	3,074	163,656	224,728	72.8
1999	53,079	3,239	171,913	230,917	74.4
2000	55,549	3,319	184,354	242,496	76.0
2001	52,003	3,295	171,352	235,311	72.8
2002	52,769	3,129	165,098	215,606	76.6
2003	53,863	2,908	156,638	204,755	76.5
2004	62,222	2,921	181,743	229,788	79.1
2005	68,210	2,922	199,324	250,854	79.5
2006	72,445	2,918	211,405	264,625	79.9
2007	75,996	2,959	224,866	279,575	80.4

Source: Department of Transportation, Office of Airline Information, *Air Carrier Traffic Statistics Monthly*.

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

**AIR CARGO STATISTICS:
U.S. COMMERCIAL AIR CARRIERS**

**Fiscal Years 1978 – 2007
(Millions of Revenue-Ton-Miles)**

Year	Total	Freight / Express / Mail	
		Domestic	International ^a
1978	7,003	4,083	2,920
1979	7,211	4,217	2,994
1980	7,255	4,105	3,150
1981	6,979	4,078	2,901
1982	6,895	3,847	3,048
1983	7,715	4,539	3,177
1984	8,857	5,228	3,629
1985	8,653	4,994	3,659
1986	10,311	5,989	4,322
1987	12,130	7,010	5,119
1988	14,136	8,075	6,061
1989	15,954	8,821	7,133
1990	16,229	8,987	7,242
1991	16,327	8,913	7,414
1992	16,793	9,474	7,319
1993	18,420	10,374	8,046
1994	20,790	11,323	9,467
1995	23,228	12,416	10,812
1996	24,217	12,782	11,435
1997	26,954	13,455	13,499
1998	28,347	13,830	14,517
1999	28,102	13,975	14,127
2000	30,057	14,699	15,358
2001	28,481	13,934	14,547
2002	27,763	12,967	14,796
2003	33,514	14,972	18,542
2004	36,463	16,341	20,122
2005	39,219	16,090	23,129
2006	39,669	15,711	23,959
2007(E)	40,072	15,821	24,251

Source: Federal Aviation Administration, Office of Aviation Policy & Plans.

a. Beginning in 2003, includes contract service by U.S. carriers for foreign carriers.

E. Estimate.

WORLD AIRLINE FLEET OF TURBINE-ENGINEED AIRCRAFT BY MODEL

Calendar Years 2003 – 2007

	2003	2004	2005	2006	2007
TOTAL AIRCRAFT IN SERVICE	<u>26,367</u>	<u>27,189</u>	<u>27,898</u>	<u>27,427</u>	<u>28,126</u>
Number Manufactured in U.S.	13,678	13,827	13,827	13,487	13,726
Percent Manufactured in U.S.	51.9%	50.9%	49.6%	49.2%	48.8%
Turbojet Aircraft in Service	<u>17,988</u>	<u>18,784</u>	<u>19,422</u>	<u>19,044</u>	<u>20,056</u>
Number Manufactured in U.S.	10,617	10,771	10,765	10,331	10,662
Percent Manufactured in U.S.	59.0%	57.3%	55.4%	54.2%	53.2%
Turboprop Aircraft in Service	<u>7,002</u>	<u>7,016</u>	<u>7,050</u>	<u>6,764</u>	<u>6,487</u>
Number Manufactured in U.S.	2,221	2,197	2,209	2,214	2,108
Percent Manufactured in U.S.	31.7%	31.3%	31.3%	32.7%	32.5%
Turbine Helicopters in Service	<u>1,377</u>	<u>1,389</u>	<u>1,426</u>	<u>1,619</u>	<u>1,583</u>
Number Manufactured in U.S.	840	859	853	942	956
Percent Manufactured in U.S.	61.0%	61.8%	59.8%	58.2%	60.4%
Turbojets-TOTAL	<u>17,988</u>	<u>18,784</u>	<u>19,422</u>	<u>19,044</u>	<u>20,056</u>
Aerospatiale Corvette	2	1	1	1	—
Aerospatiale SE-210 Caravelle	5	3	3	—	—
Airbus A300	389	404	398	383	377
Airbus A310	187	197	198	182	182
Airbus A318	9	19	28	37	52
Airbus A319	541	634	774	901	1,018
Airbus A320	1,207	1,307	1,447	1,580	1,811
Airbus A321	270	321	337	372	427
Airbus A330	273	322	381	442	519
Airbus A340	246	277	302	320	333
Airbus A380	—	—	—	—	2
Antonov 124	17	19	27	27	27
Antonov 225	1	1	1	1	1
Antonov 72/74	20	34	38	29	25
Avro RJ-70/85/100	172	163	158	128	140
B.Ae. (HS) 125	18	20	18	22	16
B.Ae. 146	168	167	170	149	150
B.Ae. One-Eleven	33	18	15	11	7
B.Ae./Aerospatiale Concorde	—	—	—	—	—
Beech 400 Beechjet	2	1	2	7	7
Boeing 707/720	54	46	43	27	20
Boeing 717	125	137	150	147	152
Boeing 727	788	709	652	472	399
Boeing 737	3,946	4,118	4,220	4,322	4,696
Boeing 747	1,002	998	986	912	918
Boeing 757	999	1,006	999	977	966
Boeing 767	857	867	858	846	856
Boeing 777	462	494	534	596	689
Bombardier BD-700	—	1	1	1	1
Canadair CL-601 Challenger	3	6	7	8	8
Canadair Regional Jet	995	1,148	1,256	1,281	1,370
Cessna Citation I/II/III	47	43	42	45	54
Dassault Falcon 10/20/50	67	69	68	69	67
Dornier/Fairchild 328 Jet	85	51	61	65	75
Eclipse 500	—	—	—	—	12
Embraer Regional Jets	700	844	963	806	1,204
Fokker F-28 Fellowship	134	133	134	79	66

(Continued on next page)

WORLD AIRLINE FLEET OF TURBINE-ENGINEED AIRCRAFT BY MODEL

Calendar Years 2003 – 2007, continued

	2003	2004	2005	2006	2007
Turbojets (continued)					
Fokker 100	219	240	208	221	232
Fokker 70	44	43	43	43	43
Gulfstream III/III/IV/V G-1159	13	13	13	14	14
Ilyushin IL-62	99	98	77	83	64
Ilyushin IL-76/IL-78	290	291	285	280	212
Ilyushin IL-86	82	76	77	69	53
Ilyushin IL-96	9	11	11	15	15
Israel Aircraft 1121/1124/1125	10	12	12	12	10
Learjet	80	91	94	107	110
Lockheed L-1011 Tristar	78	51	47	35	30
MBB Hansa HFB-320	6	6	4	4	—
McDonnell Douglas DC-8	163	146	146	112	104
McDonnell Douglas DC-9	483	447	433	308	265
McDonnell Douglas DC-10	212	197	184	149	147
McDonnell Douglas MD-11	182	186	190	180	188
McDonnell Douglas MD-80	1,020	1,114	1072	961	925
McDonnell Douglas MD-90	104	107	111	108	109
Premier IA	—	—	—	—	1
Rockwell Sabre	—	—	2	2	—
Rombac 111-560	—	—	—	4	4
Tupolev Tu-134	205	212	243	232	190
Tupolev Tu-154	457	460	431	415	350
Tupolev Tu-204/214	18	17	23	25	22
Yakovlev Yak-40/42	390	388	444	420	321
Turboprops-TOTAL	<u>7,012</u>	<u>7,016</u>	<u>7,050</u>	<u>6,764</u>	<u>6,487</u>
Aerospatiale N.262/Mohawk 298	10	9	9	7	3
Aerospatiale/Aeritalia ATR 42	302	310	301	290	300
Aerospatiale/Aeritalia ATR 72	262	283	287	309	338
Airtech CN-235	14	14	7	10	—
Antonov An-3	—	—	4	—	3
Antonov An-8	6	—	—	—	—
Antonov An-12	113	115	130	126	116
Antonov An-22	1	1	1	1	1
Antonov An-24/26/30/32/38/140	566	578	626	586	495
B.Ae. ATP	32	30	34	28	35
B.Ae. Viscount	3	3	3	3	—
B.Ae. (HP-137) Jetstream 31/32	164	153	163	157	142
B.Ae. Jetstream 41	91	66	59	48	51
B.Ae. HS-748	91	89	85	55	45
Beech 18 Turbo	4	4	4	8	6
Beech 90 King Air	34	33	26	31	26
Beech 99	144	139	138	132	131
Beech 100 King Air	51	52	51	54	56
Beech 200/300 Super King Air	147	149	151	171	158
Beech 1300	9	10	9	10	6
Beech 1900C/D	405	419	409	450	473
Canadair CL-44	1	—	1	1	—
CASA/Nurtanio C-212 Aviocar	91	85	82	81	81

(Continued on next page)

WORLD AIRLINE FLEET OF TURBINE-ENGINEED AIRCRAFT BY MODEL

Calendar Years 2003 – 2007, continued

	2003	2004	2005	2006	2007
Turboprops (continued)					
Cessna 207 Turbo	—	—	—	2	2
Cessna 208 Caravan I	754	742	765	751	745
Cessna F406 Caravan II	31	27	29	28	23
Cessna 425/441 Conquest I/II	16	20	17	20	16
Convair 580/600/640	89	85	84	70	47
DHC-2/3 Turbo Beaver/Otter	36	46	56	59	59
DHC-5 Buffalo	1	1	2	—	—
DHC-6 Twin Otter	343	331	333	317	316
DHC-7 Dash 7	58	58	58	51	49
DHC-8 Dash 8	574	589	604	650	668
Dornier DO-228	110	106	109	90	91
Dornier DO-328	89	80	75	61	68
Douglas DC-3T Turbo Express	5	5	6	8	7
Embraer EMB-110 Bandeirante	149	154	138	130	86
Embraer EMB-120 Brasília	256	258	248	203	207
Embraer EMB-121 Xingu	1	2	1	1	1
Fokker/Fairchild F-27/FH-227 Fri	209	205	169	112	119
Fokker 50	155	169	168	165	166
GAF Nomad	11	10	8	7	7
Grumman G-73 Turbo Mallard	6	6	5	6	—
Grumman G-159 Gulfstream I	4	4	3	4	3
Harbin YU-12 II	38	38	38	32	26
IAI Arava	1	1	1	—	—
Ilyushin IL-114	3	3	3	1	3
Ilyushin IL-18	39	40	32	34	27
LET L-410	217	224	247	267	223
Lockheed L-100/L-382 Hercules	45	46	42	40	37
Lockheed L-188 Electra	32	29	29	13	11
Mitsubishi MU-2B	15	18	15	17	12
Neiva NE-821 Caraja	—	—	—	6	6
Nihon AMC YS-11	29	23	21	18	13
Piaggio P-180 Avanti	2	1	2	2	2
Pilatus Britten-Norman BN-2T T1	4	2	2	2	1
Pilatus PC-6 Turbo Porter	17	24	24	30	23
Pilatus PC-XII	21	21	20	19	18
Piper PA-31T/42 Cheyenne	22	23	25	20	17
Piper T-1040	6	6	6	6	4
PZL (Antonov) An-28	44	40	47	45	32
Rockwell Turbo Commander	7	8	8	8	6
Saab 2000	47	50	50	45	44
Saab SF-340A/B	367	371	375	314	323
Shaanxi Yunshuji Y8F-100	—	—	—	4	4
Shorts 330	32	32	29	26	25
Shorts 360	94	103	96	68	77
Shorts SC-5 Belfast	—	—	1	1	1
Shorts SC-7 Skyliner/Skyvan	25	24	23	23	24
Swearingen Merlin	23	30	54	50	22
Swearingen Metro	387	360	348	332	312
Transall C-160	6	6	6	4	3

(Continued on next page)

WORLD AIRLINE FLEET OF TURBINE-ENGINEED AIRCRAFT BY MODEL

Calendar Years 2003 – 2007, continued

	2003	2004	2005	2006	2007
Turboprops (continued)					
Xian (Antonov) Y-7/Y-8/MA-60	51	53	48	44	45
Helicopters-TOTAL	<u>1,377</u>	<u>1,389</u>	<u>1,426</u>	<u>1,619</u>	<u>1,583</u>
Agusta/Westland A109	3	4	5	4	4
Agusta/Westland A119	—	—	10	12	14
Agusta/Westland AW139	—	—	3	8	13
Bell (Agusta/Fuji) 204	4	5	2	2	2
Bell 205	14	14	—	—	—
Bell 206 Jetranger/Longranger	294	309	289	307	304
Bell 212	110	101	96	98	97
Bell 214	11	10	11	10	10
Bell 222 UT/A	2	2	2	3	2
Bell 407	71	74	79	83	85
Bell 412	73	81	84	111	109
Bell 430	2	2	2	3	3
Boeing 107	15	15	15	15	14
Boeing-Vertol BV-234	9	9	9	9	6
Eurocopter SA-315 Lama	—	—	—	14	14
Eurocopter SA-316 Alouette III	1	1	1	6	6
Eurocopter SA-318 Alouette II	1	1	1	1	1
Eurocopter (Nurtanio) SA-330 Puma	6	6	6	6	6
Eurocopter AS-332 Super Puma	95	89	96	98	98
Eurocopter AS-350 Ecureuil/Astar	123	128	125	128	137
Eurocopter AS-355 Ecureuil 2/Twinstar	18	11	14	13	14
Eurocopter SA-365 Dauphin II	54	53	58	64	55
Eurocopter EC-120	5	12	21	19	19
Eurocopter EC-135	—	—	18	29	29
Eurocopter EC-155	—	—	2	1	3
Helibras HB-350B	—	—	—	2	—
Hiller UH-12T	—	—	2	2	—
Hughes (Kawasaki) 500/369D	9	9	4	3	1
Kamov Ka-26	16	20	4	—	—
MBB BK-117	8	8	8	8	6
MBB/Nurtanio Bo.105	83	81	79	75	74
MD Helicopters MD-900	4	4	4	4	—
Mil Mi-2	26	26	28	46	30
Mil Mi-6	6	—	—	1	—
Mil Mi-8	78	82	85	96	87
Mil Mi-14	1	1	1	1	1
Mil Mi-26	7	7	8	45	16
Sikorsky CH-54 Series	—	—	—	5	—
Sikorsky S-58T	1	2	2	1	—
Sikorsky S-61	75	65	67	64	61
Sikorsky S-64	5	5	5	—	—
Sikorsky S-76	147	151	173	209	249
Sikorsky S-92	—	1	7	13	13

Source: Air BP Lubricants, *Turbine-Engineed Fleets of the World's Airlines*.Notes: *Turbine-Engineed Fleets of the World's Airlines* covers aircraft in airline service as of end-of-year.

Excludes air taxi operators.

NUMBER AND PERCENT OF CIVIL TURBOJET ENGINES IN WORLD AIRLINE FLEET BY MANUFACTURER AND AIRCRAFT MODEL

As of December 2007

Aircraft Manufacturer and Model	Total Installed Engines	Engine Manufacturers					
		P&W	GE	RR	CFM	IAE	Other
TOTAL ENGINES	55,525	12,715	9,437	6,986	13,904	2,978	9,505
PERCENT OF TOTAL	100.0%	22.9%	17.0%	12.6%	25.0%	5.4%	17.1%
Airbus A300(a)	510	29%	71%	— %	— %	— %	— %
Airbus A300B4-600R	320	54	46	—	—	—	—
Airbus A310(a)	192	40	60	—	—	—	—
Airbus A310-300	252	34	66	—	—	—	—
Airbus A318	98	6	—	—	94	—	—
Airbus A319(a)	88	—	—	—	64	36	—
Airbus A319(b)	1,964	—	—	—	66	34	—
Airbus A320(a)	30	—	—	—	93	7	—
Airbus A320-200	3,518	—	—	—	54	46	—
Airbus A321(a)	162	—	—	—	46	54	—
Airbus A321-200	668	—	—	—	48	52	—
Airbus A330-200	546	23	35	42	—	—	—
Airbus A330-300	454	37	23	40	—	—	—
Airbus A340(a)	780	—	—	54	46	—	—
Airbus A340-300X	604	—	—	—	100	—	—
Airbus A380-800	4	—	—	100	—	—	—
Antonov AN-72	30	—	—	—	—	—	100
Antonov AN-74	62	—	—	—	—	—	100
Antonov AN-124	188	—	—	—	—	—	100
Antonov AN-225	6	—	—	—	—	—	100
Avro Int'l RJ	660	—	—	—	—	—	100
BAe 1-11	82	—	—	100	—	—	—
BAe 146	776	—	—	—	—	—	100
BAe/HS 125	34	5	—	—	—	—	95
BAe VC-10	88	—	—	100	—	—	—
Beech 400 Beechjet	14	100	—	—	—	—	—
Boeing B-707	936	82	—	—	18	—	—
Boeing B-717	310	—	—	100	—	—	—
Boeing B-720B	16	100	—	—	—	—	—
Boeing B-727 series(a)	720	94	—	6	—	—	—
Boeing B-727-200 ADV	753	100	—	—	—	—	—
Boeing B-727-200A(F)	741	100	—	—	—	—	—
Boeing B-737(a)	920	29	—	—	70	—	1
Boeing B-737-200 ADV	1,162	100	—	—	—	—	—
Boeing B-737-300	1,986	—	—	—	100	—	—
Boeing B-737-400	922	—	—	—	100	—	—
Boeing B-737-500	760	—	—	—	100	—	—
Boeing B-737-700	1,792	—	—	—	100	—	—
Boeing B-737-800	2,584	—	—	—	100	—	—
Boeing B-747(a)	2,100	49	41	10	—	—	—
Boeing B-747-400	1,628	38	37	25	—	—	—
Boeing B-747-400F	460	29	57	14	—	—	—
Boeing B-757(a)	518	25	—	75	—	—	—
Boeing B-757-200	1,548	47	—	53	—	—	—
Boeing B-767(a)	346	13	87	—	—	—	—
Boeing B-767-200ER	250	49	51	—	—	—	—
Boeing B-767-300	202	25	75	—	—	—	—
Boeing B-767-300ER	1,046	35	59	6	—	—	—
Boeing B-777(a)	536	27	51	22	—	—	—
Boeing B-777-200ER	818	22	38	40	—	—	—

(Continued on next page)

NUMBER AND PERCENT OF CIVIL TURBOJET ENGINES IN WORLD AIRLINE FLEET BY MANUFACTURER AND AIRCRAFT MODEL

As of December 2007, continued

Canadair CL 601/604	12	— %	100%	— %	— %	— %	— %
Canadair RJ series(a)	434	—	100	—	—	—	—
Canadair Regional Jet(b)	454	—	100	—	—	—	—
Canadair Regional Jet 200	1,448	—	100	—	—	—	—
Canadair Regional Jet 700	518	—	100	—	—	—	—
Cessna 500s	98	86	—	14	—	—	—
Cessna 650	16	—	—	—	—	—	100
Cessna 750	2	—	—	100	—	—	—
Dassault Falcon	140	—	91	—	—	—	9
Embraer ERJ-135(b)	244	—	—	100	—	—	—
Embraer ERJ-140	150	—	—	100	—	—	—
Embraer ERJ-145 series(a)	396	—	—	100	—	—	—
Embraer ERJ-145(b)	1,178	—	100	—	—	—	—
Embraer ERJ-170	386	—	100	—	—	—	—
Embraer ERJ-190	250	—	100	—	—	—	—
Fairchild Dornier 328 Jet	206	100	—	—	—	—	—
Fokker F-28	286	—	—	100	—	—	—
Fokker 70	92	—	—	100	—	—	—
Fokker 100	526	—	—	100	—	—	—
Gulfstream II/III/IV	28	—	—	100	—	—	—
IAI 1123/1124/1125	20	—	—	—	—	—	100
Ilyushin IL-62	640	—	—	—	—	—	100
Ilyushin IL-76	1,852	—	—	—	—	—	100
Ilyushin IL-78	8	—	—	—	—	—	100
Ilyushin IL-86	324	—	—	—	—	—	100
Ilyushin IL-96	72	—	—	—	—	—	100
Learjet 23/24/25	114	—	100	—	—	—	—
Learjet 31/35/36/40/45/55	118	—	—	—	—	—	100
Learjet 60	14	100	—	—	—	—	—
Lockheed L-1011	300	—	—	100	—	—	—
MBB HFB-320 Hansa Jet	8	—	100	—	—	—	—
Douglas DC-8	592	47	—	—	53	—	—
Douglas DC-9(a)	458	100	—	—	—	—	—
Douglas DC-9-30	516	100	—	—	—	—	—
Douglas DC-10	792	6	94	—	—	—	—
MDC MD-11	588	39	61	—	—	—	—
MDC MD-80s(a)	252	100	—	—	—	—	—
MDC MD-82	1,048	100	—	—	—	—	—
MDC MD-83	528	100	—	—	—	—	—
MDC MD-88	312	100	—	—	—	—	—
MDC MD-90-30	220	—	—	—	—	100	—
Rockwell Sabreliner	2	100	—	—	—	—	—
Tupolev TU-134	928	—	—	—	—	—	100
Tupolev TU-154(a)	552	—	—	—	—	—	100
Tupolev TU-154B-2	612	—	—	—	—	—	100
Tupolev TU-154M	789	—	—	—	—	—	100
Tupolev TU-204	50	—	—	16	—	—	84
Tupolev TU-214	14	—	—	—	—	—	100
VFW-Fokker VFW-614	8	—	—	100	—	—	—
Yakovlev YAK-40 series(a)	177	—	—	—	—	—	100
Yakovlev YAK-40	1,140	—	—	—	—	—	100
Yakovlev YAK-42	429	—	—	—	—	—	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 = BAE Systems; CFM = CFM International; GE = General Electric;
IAE = International Aero Engines; IAI = Israel Aircraft Industries; MBB = Messerschmitt Bolkow Blohm;
MDC = McDonnell Douglas; P&W = Pratt & Whitney; RR = Rolls-Royce.

ACTIVE U.S. AIR CARRIER FLEET
BY TYPE OF AIRCRAFT, NUMBER OF ENGINES, AND MODEL

As of December 2003 – 2007

	2003	2004	2005	2006	2007
TOTAL	8,176	8,186	8,225	8,089	8,044
Turbojets—TOTAL	6,523	6,691	6,839	6,784	6,784
Four-Engine—TOTAL	337	305	310	272	263
Boeing 747	180	162	164	168	177
B.Ae./AVRO 146	53	52	48	7	-
MD DC-8	104	91	98	97	86
Three-Engine—TOTAL	602	519	540	523	416
Boeing 727	361	296	293	287	182
Lockheed L-1011	17	12	8	4	4
MD DC-10/MD-11	224	211	239	232	230
Twin-Engine—TOTAL	5,584	5,867	5,989	5,989	6,105
Airbus A-300	132	133	153	161	163
Airbus A-310	51	51	62	68	68
Airbus A-318	4	6	7	7	11
Airbus A-319	238	258	285	288	292
Airbus A-320	308	327	350	353	371
Airbus A-321	29	32	34	34	33
Airbus A-330	13	22	27	31	38
British Aerospace Bae-125	-	-	-	-	3
Boeing 717	95	105	117	123	123
Boeing 737	1,387	1,407	1,304	1,312	1,361
Boeing 757	652	651	644	643	641
Boeing 767	361	378	370	349	350
Boeing 777	129	125	122	124	127
Canadair CL-600/604	693	872	936	926	971
Cessna C500/C501/C525/C650	5	6	3	3	6
Embraer ERJ-135	158	160	160	160	160
Embraer ERJ-145	346	446	493	499	506
Embraer ERJ-170	-	29	73	76	106
Embraer ERJ-190	-	-	7	23	30
Fokker F-28	77	11	5	4	4
Learjet LR-24/25/31/35	1	1	-	-	4
MD DC-9/MD-80/MD-90	905	847	837	805	737
Turboprops—TOTAL	1,123	989	889	807	764
Four-Engine—TOTAL	16	17	7	7	7
De Havilland DHC-7	2	-	-	-	-
Lockheed 188 Electra	8	12	-	-	-
Lockheed 382	6	5	7	7	7

(Continued on next page)

ACTIVE U.S. AIR CARRIER FLEET
BY TYPE OF AIRCRAFT, NUMBER OF ENGINES, AND MODEL

As of December 2003 – 2007, continued

	2003	2004	2005	2006	2007
Twin-Engine—TOTAL	1,107	968	880	795	753
Beech BE90	1	1	1	1	1
Beech BE99	9	13	12	13	11
Beech BE100	4	4	4	4	4
Beech BE200	3	3	3	3	3
Beech BE1900	172	159	133	133	125
B.Ae. Jetstream	83	73	45	22	6
CASA C212 Aviocar	8	4	4	4	5
Cessna C441	3	3	3	-	-
Cessna CE208B	50	50	55	56	66
Convair 580/600/640	1	-	1	2	1
Curtis C-46	2	2	2	2	2
DeHavilland DHC-6	25	18	28	20	10
DeHavilland DHC-8	170	154	149	154	157
Dornier DO328	79	46	14	10	12
Embraer EMB110	1	1	1	1	1
Embraer EMB120	136	127	104	80	77
Fairchild/Fokker F-27/FH-227	34	-	17	-	-
Grumman G-73	5	5	5	-	2
Piper PA31T	5	5	2	2	2
Reims F406	-	-	-	4	4
Saab-Fairchild SF340	210	208	195	169	155
Shorts SC-7	3	3	3	3	2
Shorts SD-3	4	5	4	10	9
SNAIS ATR-42	16	7	28	26	25
SNAIS ATR-72	62	61	57	56	57
Swearingen SA-227	21	16	10	20	16
Single-Engine—TOTAL	-	4	2	5	4
Piston-Engine—TOTAL	498	470	454	455	453
Four-Engine—TOTAL	13	20	20	18	18
Douglas DC-6	13	20	20	18	18
Three-Engine—TOTAL	3	2	2	14	15
Pilatus Britten-Norman BN2A-MK-3	3	2	2	14	15
Twin-Engine—TOTAL	143	125	126	98	92
Single-Engine—TOTAL	339	323	306	325	328
Helicopters—TOTAL	32	36	43	47	46

Source: Federal Aviation Administration.

Notes: "Active aircraft" equals the average number of aircraft reported in operation during the last quarter of the year.

Includes certificated route air carriers, supplemental air carriers (charters), multi-engine aircraft in passenger service of commuters, and all aircraft over 12,500 lbs operated by Part 121 and Part 135 commuter operators.

Previous years' data may have been revised to reflect updated and/or newly available information.

ACTIVE U.S. MILITARY AIRCRAFT^a**Fiscal Years 1984 – 2008**

Year	TOTAL	Fixed-Wing Aircraft				Helicopters
		Total	Jet	Turboprop	Piston	
1984	18,833	11,661	9,551	1,777	333	7,172
1985	19,333	11,929	9,640	1,881	408	7,404
1986	20,157	11,919	9,730	1,803	386	8,238
1987	20,514	12,054	9,819	1,865	370	8,460
1988	21,010	12,481	9,954	2,222	305	8,529
1989	19,223	11,893	9,501	2,131	261	7,330
1990	20,017	12,817	10,360	2,199	258	7,200
1991	19,966	12,587	10,221	2,119	247	7,379
1992	19,210	11,936	9,672	2,035	229	7,274
1993	17,231	9,681	7,651	1,852	178	7,550
1994	17,018	9,803	7,786	1,835	182	7,215
1995	16,207	9,277	7,294	1,754	229	6,930
1996(b)	20,554	10,154	7,798	2,199	157	10,400
1997	20,245	9,677	7,364	2,151	162	10,568
1998	15,551	9,153	7,082	1,951	120	6,398
1999	16,051	9,004	6,981	1,908	115	7,047
2000	15,891	8,766	6,738	2,023	5	7,125
2001	16,123	8,992	6,790	2,084	118	7,131
2002	16,005	8,961	6,748	2,092	121	7,044
2003	16,200	8,972	6,748	2,103	121	7,228
2004	15,042	8,732	6,631	1,987	114	6,310
2005	13,032	7,429	5,525	1,862	42	5,603
2006	12,898	7,483	5,602	1,839	42	5,415
2007	13,187	7,830	5,856	1,953	21	5,358
2008	13,485	8,185	6,110	2,066	9	5,300

Source: Aerospace Industries Association.

a. Includes Army, Air Force, Navy, and Marine regular service aircraft, as well as Reserve and National Guard Aircraft.

b. Prior years data provided by Office of the Secretary of Defense and limited to aircraft in the continental United States.

ACTIVE U.S. CIVIL AIRCRAFT^a

As of End-of-Year, 1977 – 2006
(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		
1977	186.8	2.47	184.3	26.7	92.0	57.3	4.7	3.6
1978	201.3	2.55	198.8	28.8	101.5	59.2	5.3	4.0
1979	213.9	3.61	210.3	31.3	106.0	62.4	5.9	4.8
1980	214.9	3.81	211.0	31.7	107.9	60.5	6.0	4.9
1981	217.2	3.97	213.2	33.3	108.0	59.9	7.0	5.0
1982	213.9	4.03	209.8	34.2	106.5	57.7	6.2	6.2
1983	217.5	4.20	213.3	34.6	107.1	59.1	6.5	5.9
1984	225.3	4.37	220.9	35.6	109.9	62.0	7.1	6.3
1985	201.2	4.68	196.5	31.3	98.5	54.9	6.0	5.8
1986	210.2	4.91	205.3	32.0	102.0	58.3	6.5	6.5
1987	208.0	5.25	202.7	30.8	100.4	59.3	5.9	6.3
1988	201.9	5.66	196.2	30.1	98.1	55.6	6.0	6.4
1989	210.8	5.78	205.0	31.9	100.5	58.4	7.0	7.2
1990	204.1	6.08	198.0	30.6	97.6	56.4	6.9	6.6
1991	202.9	6.05	196.9	29.7	97.8	55.1	6.2	8.1
1992	193.0	7.32	185.7	26.8	91.6	53.2	6.0	8.0
1993	184.4	7.30	177.1	22.8	91.6	42.5	4.7	15.5
1994	180.3	7.37	172.9	22.3	87.3	40.5	4.7	18.1
1995	195.5	7.41	188.1	24.6	93.6	44.1	5.8	19.9
1996	198.6	7.48	191.1	25.6	93.8	44.3	6.6	20.9
1997	200.0	7.62	192.4	26.2	95.0	45.7	6.8	18.8
1998	212.8	8.11	204.7	29.9	103.6	41.8	7.4	22.1
1999	227.7	8.23	219.5	32.8	109.3	42.6	7.4	27.3
2000	225.6	8.06	217.5	33.2	108.0	42.1	7.2	27.1
2001	219.9	8.50	211.4	31.7	106.3	39.7	6.8	27.0
2002	219.4	8.19	211.2	31.7	105.5	39.2	6.6	28.3
2003	217.9	8.18	209.7	31.5	107.6	38.5	6.5	26.6
2004	227.6	8.19	219.4	33.8	109.8	39.3	7.8	28.7
2005	232.6	8.23	224.4	34.7	111.0	39.7	8.7	30.3
2006	230.0	8.09	221.9	35.1	109.9	38.5	7.9	30.6

Source: Federal Aviation Administration.

a. "Active aircraft" must have a current U.S. registration and have flown during the calendar year.

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

c. Includes autogiros; excludes air carrier helicopters.

d. Includes gliders, dirigibles, balloons, and experimental aircraft. Beginning in 2005, "Other" also includes "Light-sport" aircraft.

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

As of December 31, 2006

Primary Use	Total	Fixed-Wing			Rotor-craft ^a	Other ^b
		Turbo-jet	Turbo-prop	Piston		
TOTAL	230,030	17,163	8,867	164,197	9,208	30,595
Air Carrier—TOTAL	8,089	6,784	803	455	47	—
Large	7,516	6,780	697	39	—	—
Small	573	4	106	416	47	—
General Aviation—TOTAL	221,941	10,379	8,064	163,742	9,161	30,595
Executive	11,053	5,922	2,436	2,098	487	110
Business	24,413	909	1,570	20,760	538	636
Air Taxi(c)	7,370	2,426	1,272	2,659	938	75
Instructional	14,315	11	78	12,143	1,258	825
Personal	149,026	750	1,177	118,618	1,525	26,956
Aerial Application	3,429	7	909	1,928	487	98
Aerial Observation	4,407	5	68	2,525	1,658	151
Aerial Other	831	6	178	233	382	32
Sight Seeing	906	—	—	151	113	642
Air Tours	445	—	19	115	267	44
External Load	213	—	—	3	206	4
Medical	1,625	75	174	375	1,001	—
Other Work	729	—	55	419	37	218
Other(d)	3,179	268	128	1,715	264	804

Source: Federal Aviation Administration.

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

a. Includes helicopters and autogiros.

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

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

d. Beginning in 2005, "Other" also includes "Light-sport" aircraft.

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

Calendar Years 1978 – 2007

Year	Total Jet Fuel Cost (Millions of Dollars)	Gallons Consumed (Millions)	Cost Per Gallon (Cents)	Cost Index (2000=100)	Cost of Fuel as Percent of Cash Operating Expenses
1978	\$4,178.6	10,352.2	40.4	54.4	19.5%
1979	6,491.7	11,032.5	58.8	79.3	23.8
1980	9,739.7	10,630.2	91.6	123.4	29.7
1981	10,494.2	9,838.7	106.7	143.7	29.6
1982	9,695.9	9,737.4	99.6	134.1	27.2
1983	9,006.7	10,225.3	88.1	118.7	24.5
1984	9,324.1	11,182.5	83.4	112.3	23.4
1985	9,352.7	10,324.9	90.6	122.0	21.7
1986	7,054.9	10,722.0	65.8	88.6	15.9
1987	7,607.5	11,542.2	65.9	88.8	15.5
1988	7,551.6	12,059.4	62.6	84.4	14.0
1989	8,572.7	14,255.4	60.1	81.0	14.4
1990	11,744.9	15,522.0	75.7	101.9	16.9
1991	9,689.9	14,340.1	67.6	91.0	14.2
1992	8,840.5	14,970.2	59.1	79.6	12.3
1993	8,583.4	14,666.2	58.5	78.8	11.8
1994	8,276.2	15,626.3	53.0	71.3	11.2
1995	8,503.6	16,105.1	52.8	71.1	11.3
1996	10,432.1	16,592.2	62.9	84.7	12.8
1997	10,402.1	16,900.8	61.5	82.9	12.4
1998	8,376.1	17,274.9	48.5	65.3	9.7
1999	9,078.2	17,409.8	52.1	70.2	9.9
2000	14,227.0	19,165.2	74.2	100.0	13.7
2001	13,220.4	19,371.3	68.2	91.9	12.5
2002	11,036.6	15,841.1	69.7	93.9	11.4
2003	13,070.5	15,487.0	84.4	113.7	13.3
2004	18,990.0	16,928.3	112.2	151.1	17.0
2005	27,293.2	17,099.5	159.6	215.0	22.2
2006	31,989.3	16,486.8	194.0	261.4	25.1
2007	33,897.3	16,540.9	204.9	276.1	25.8

Source: Air Transport Association of America, *Airline Cost Index*.

a. Majors and Nationals.

U.S. GENERAL AVIATION^a
TYPE OF AIRCRAFT AND HOURS FLOWN
Calendar Years 2002 – 2006

	2002	2003	2004	2005	2006
NUMBER OF ACTIVE AIRCRAFT BY TYPE (Thousands)					
All Aircraft:	211.2	209.7	219.4	224.4	221.9
Fixed-Wing:	176.3	176.6	182.9	185.4	182.2
Piston:	161.1	160.9	165.2	167.6	163.7
Single-Engine	143.5	143.3	146.6	148.1	145.0
Twin-Engine	17.5	17.5	18.5	19.4	18.7
Other	0.1	0.2	0.1	0.1	-
Turboprop:	6.8	7.7	8.4	7.9	8.1
Twin-Engine	5.7	5.8	5.9	5.3	5.5
Other	1.1	1.9	2.5	2.6	2.6
Turbojet:	8.4	8.0	9.3	9.8	10.4
Twin-Engine	7.7	7.5	8.6	9.1	10.4
Other	0.7	0.5	0.7	0.7	-
Rotorcraft:	6.6	6.5	7.8	8.7	9.2
Piston	2.4	2.1	2.3	3.0	3.2
Turbine	4.3	4.4	5.5	5.7	5.9
Balloons, Dirigibles, and Gliders	6.4	6.0	5.9	6.5	6.3
Experimental	21.9	20.6	22.8	23.6	23.0
Light-sport	NA	NA	NA	0.2	1.3
HOURS FLOWN BY TYPE OF AIRCRAFT (Thousands)					
All Aircraft:	27,040	27,329	28,126	26,982	27,705
Fixed-Wing: Piston	18,891	19,013	18,142	16,434	16,525
Turboprop	1,850	1,922	2,161	2,106	2,162
Turbojet	2,745	2,704	3,718	3,771	4,077
Rotorcraft: Piston	454	448	514	617	918
Turbine	1,422	1,687	2,020	2,439	2,528
Balloons, Dirigibles, and Gliders	333	263	249	267	211
Experimental	1,345	1,292	1,322	1,339	1,218
Light-sport	NA	NA	NA	9	66
AVERAGE HOURS FLOWN ANNUALLY BY TYPE					
All Aircraft (AVERAGE):	128	130	128	120	125
Fixed-Wing: Piston	117.3	118.1	109.8	98.1	100.9
Turboprop	270.4	250.0	257.9	265.2	268.2
Turbojet	328.6	338.1	399.9	383.9	392.8
Rotorcraft: Piston	192.9	210.9	222.0	202.9	281.2
Turbine	331.0	383.2	366.8	428.8	428.8
Balloons, Dirigibles, and Gliders	52.2	43.9	42.0	41.4	33.6
Experimental	61.3	62.9	58.0	56.7	52.8
Light-sport	NA	NA	NA	54.7	51.7

Source: Federal Aviation Administration.

a. Excludes commuters.

NA. Not available.

U.S. GENERAL AVIATION
ACTIVE AIRCRAFT AND HOURS FLOWN BY PRIMARY USE
Calendar Years 2002 – 2006

Primary Use	2002	2003	2004	2005	2006
ACTIVE AIRCRAFT AS OF END-OF-YEAR (Thousands)					
TOTAL	211.2	209.7	219.4	224.4	221.9
Executive	10.8	10.5	10.2	10.6	11.1
Business	24.2	25.0	24.2	25.5	24.4
Air Taxi(a)	3.9	2.6	6.2	6.9	7.4
Instructional	13.2	12.7	13.1	13.4	14.3
Personal	146.0	146.7	149.7	151.4	149.0
Aerial Application	4.0	3.3	3.2	3.5	3.4
Aerial Observation	4.5	4.2	4.8	4.7	4.4
Aerial Other	0.9	0.8	0.8	0.8	0.8
Sight Seeing	0.6	0.9	1.1	0.9	0.9
Air Tours	0.3	0.2	0.4	0.6	0.4
External Load	0.2	0.2	0.2	0.2	0.2
Medical	1.0	0.9	1.6	1.4	1.7
Other Work	1.7	1.7	0.9	0.7	0.7
Other	NA	NA	3.1	3.6	3.2
HOURS FLOWN (Thousands)					
TOTAL	27,040	27,329	28,126	26,982	27,705
Executive	3,275	3,227	2,849	3,072	3,114
Business	3,287	3,377	3,249	3,244	3,234
Air Taxi(a)	1,346	1,171	2,540	2,857	2,746
Instructional	4,182	4,393	4,035	3,635	4,322
Personal	11,025	11,251	10,239	9,266	9,141
Aerial Application	1,182	1,099	1,142	1,031	946
Aerial Observation	1,366	1,262	1,457	1,265	1,197
Aerial Other	187	172	143	148	241
Sight Seeing	134	175	204	191	171
Air Tours	149	161	224	352	295
Medical	441	524	635	716	816
External Load	97	103	125	134	136
Other Work	369	414	264	176	198
Other	NA	NA	1,019	894	1,149

Source: Federal Aviation Administration, *General Aviation and Air Taxi Activity Survey*.

a. Air taxis under 12,500 pounds.

NA. Not available.

HELIPORTS / HELIPADS IN THE UNITED STATES BY STATE^a**As of 2007**

State	TOTAL Helipads in State	Private Use		Public Use	
		Heliports & Helistops	Helipads at Airports	Heliports & Helistops	Helipads at Airports
Alabama	97	96	—	—	1
Alaska	47	37	3	6	1
Arizona	123	114	1	—	8
Arkansas	87	84	—	—	3
California	432	401	2	—	29
Colorado	188	184	—	—	4
Connecticut	95	89	—	3	3
Delaware	15	14	—	1	—
District of Columbia	18	17	—	1	—
Florida	292	286	3	1	2
Georgia	122	120	—	—	2
Hawaii	20	18	—	—	2
Idaho	49	47	1	—	1
Illinois	274	265	3	4	2
Indiana	135	130	3	2	—
Iowa	90	90	—	—	—
Kansas	45	38	1	—	6
Kentucky	61	61	—	—	—
Louisiana	251	243	2	4	2
Maine	16	14	—	—	2
Maryland	76	73	1	—	2
Massachusetts	141	139	1	—	1
Michigan	104	98	1	4	1
Minnesota	60	59	—	—	1
Mississippi	49	48	—	1	—
Missouri	134	129	1	2	2
Montana	35	32	—	2	1
Nebraska	39	37	1	—	1
Nevada	38	35	—	—	3
New Hampshire	81	81	—	—	—

(Continued on next page)

HELIPORTS / HELIPADS IN THE UNITED STATES BY STATE^a**As of 2007, Continued**

State	TOTAL Helipads in State	Private Use		Public Use	
		Heliports & Helistops	Helipads at Airports	Heliports & Helistops	Helipads at Airports
New Jersey	270	265	—	2	3
New Mexico	27	25	2	—	—
New York	181	169	2	5	5
North Carolina	81	78	—	3	—
North Dakota	16	15	—	—	1
Ohio	216	205	1	9	1
Oklahoma	90	88	—	2	—
Oregon	112	108	3	1	—
Pennsylvania	356	345	1	8	2
Rhode Island	19	18	—	1	—
South Carolina	36	33	—	—	3
South Dakota	35	34	—	—	1
Tennessee	106	104	1	—	1
Texas	519	500	7	5	7
Utah	51	49	—	—	2
Vermont	21	21	—	—	—
Virginia	145	142	—	—	3
Washington	162	154	3	1	4
West Virginia	42	40	—	—	2
Wisconsin	93	91	—	—	2
Wyoming	27	25	—	—	2
TOTAL	5,819	5,588	44	68	119

Source: Helicopter Association International, *2007 Helicopter Annual*.

Note: 96.5 percent of all U.S. helicopter landing areas are private, while 3.5 percent are public.

a. Excludes temporary heliports, offshore heliports, and infrequently used helicopter landing sites.

U.S. LANDING FACILITIES BY STATE AND BY TYPE

As of December 31, 2007

State	TOTAL	Public	Private	Military	State	TOTAL	Public	Private	Military
Alabama	292	98	183	11	Nevada	134	50	79	5
Alaska	729	412	298	19	New Hampshire	141	25	116	-
Arizona	309	79	222	8	New Jersey	396	48	341	7
Arkansas	319	101	215	3	New Mexico	177	60	112	5
California	952	259	664	29	New York	594	152	441	1
Colorado	448	76	367	5	North Carolina	409	112	286	11
Connecticut	153	24	129	-	North Dakota	307	90	215	2
Delaware	49	11	37	1	Ohio	729	172	556	1
Dist. Of Col.	20	3	13	4	Oklahoma	415	142	267	6
Florida	854	128	700	26	Oregon	457	98	359	-
Georgia	475	108	355	12	Pennsylvania	826	133	686	7
Hawaii	54	14	34	6	Rhode Island	31	8	22	1
Idaho	270	119	150	1	South Carolina	200	68	127	5
Illinois	833	114	718	1	South Dakota	191	75	115	1
Indiana	635	108	522	5	Tennessee	316	80	234	2
Iowa	309	120	186	3	Texas	1,939	390	1,527	22
Kansas	405	143	260	2	Utah	149	47	99	3
Kentucky	222	61	158	3	Vermont	89	17	72	-
Louisiana	492	76	412	4	Virginia	453	67	368	18
Maine	162	68	93	1	Washington	531	136	385	10
Maryland	235	36	192	7	West Virginia	126	35	90	1
Massachusetts	235	40	193	2	Wisconsin	561	133	426	2
Michigan	489	231	257	1	Wyoming	116	41	75	-
Minnesota	513	155	357	1	Total - 50 States	20,065	5,187	14,600	278
Mississippi	252	81	165	6	Puerto Rico	50	11	38	1
Missouri	525	131	391	3	Virgin Islands	8	2	6	-
Montana	269	123	144	2	S. Pacific(b)	21	10	9	2
Nebraska	278	89	187	2	TOTAL	20,144	5,210	14,653	281

FACILITIES BY CLASS

CLASS	TOTAL	Public ^a	Private	Military
Airports	13,822	4,929	8,695	198
Heliports	5,708	66	5,559	83
Seaplane Bases	527	212	315	-
Stolports	87	3	84	-
TOTAL	20,144	5,210	14,653	281

Source: Federal Aviation Administration.
a. "Public" refers to use, whether publicly or privately owned.
b. American Samoa, Guam, and Trust Territories.

RESEARCH & DEVELOPMENT



B-747SP SOFIA Airborne Observatory (NASA Photo)

Federal outlays for research and development (R&D) increased \$6.9 billion, or 5.6 percent, in fiscal year (FY) 2007 to \$129.7 billion. The Defense Department was the largest federal supporter of R&D, with outlays of \$73.7 bil-

lion, while NASA distributed \$9.4 billion and the Department of Energy \$9.1 billion.

The aerospace industry is particularly reliant on intellectual property for its high value products. Consequently, aerospace generally has a proportionately higher level of R&D investment than other manufacturing industries. For the aerospace industry, company R&D funding was 4.9 percent of net sales in 2006, compared to 3.6 percent for all manufacturing industries.

The aerospace industry employed 37,500 R&D scientists and engineers in 2007, which represented 3.3 percent of all R&D scientists employed by all industries. According to the National Science Foundation (NSF), the aerospace industry faces significantly higher R&D costs than the industry average. In 2006, the cost per aerospace R&D scientist and engineer was \$419,381 per year, while the average for all industries was \$235,208.

According to the NSF, the aerospace industry had \$16.4 billion in funds for R&D in 2006, the highest level in eight years. This number is likely on the conservative side, as some analysts suggest that if all R&D accounts were included, the number could well top \$35 billion. Of the aerospace R&D funding measured by the NSF, private industry provided 73.1 percent, or \$12 billion. The remainder came from the federal government.

Generally, aerospace R&D is classified as basic research, applied research, or development. In 2006, development accounted for the largest segment of aerospace R&D, with \$12.4 billion, followed by applied research at \$3.4 billion, and basic research at \$604 million.

NASA's federal budget authority for aeronautics R&D grew by almost \$2 billion in 2007 to \$15 billion. Of this total, the Defense Department was responsible for \$11.6 billion, and the Department of Transportation for \$2.6 billion. NASA's own aeronautics research dropped 20 percent to \$717 million.



Orion PA-1 Abort Flight Test Module (NASA Photo)

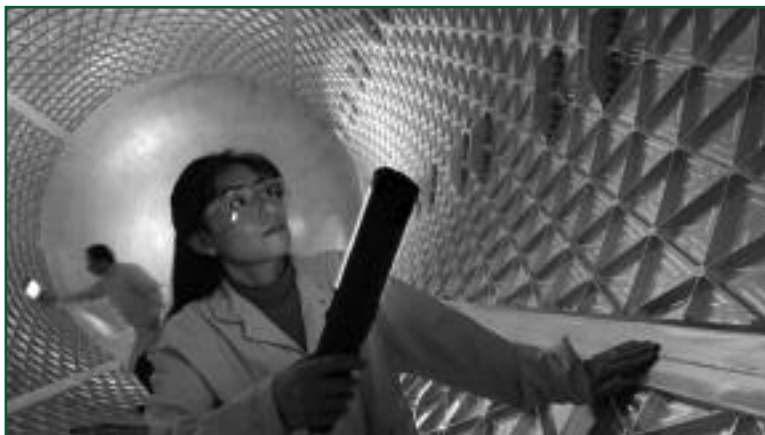
Defense Department outlays for research, development, test and evaluation (RDT&E) increased to \$73.1 billion in 2007. All three major services increased such funding: \$22.9 billion for Air Force, \$11.4 billion for Army, and \$18.8 billion for Navy. Other, Defense-wide RDT&E outlays came to \$20.1 billion for the year. In 2007, the F-35 Joint

Strike Fighter was the Defense Department's leading RDT&E aircraft program, with funding of \$4.2 billion. The Multi-mission Maritime Aircraft program followed, with funding of \$1.1 billion. Other prominent programs included the VH-71 Executive Helicopter, the F-22 Raptor, the EA-18G Growler, the E-10 MC2A squadron, and the CH-53X Sea Stallion.

The top five R&D products sought by the federal government in FY 2007 were all relevant to the aerospace industry. These included defense aircraft development, defense missile and space systems, and space science and applications. Of the \$40.2 billion in Defense Department prime contract awards for RDT&E, aircraft accounted for \$8.6 billion, missile and space systems \$8.0 billion, and electronics and communications equipment \$6.1 billion.



F-35 Lightning II (Lockheed Martin Photo)



Atlas V Rocket (Lockheed Martin Photo)

In 2006, California was again the largest recipient of federal contracts for R&D, as well as industry-funded R&D. Including all sources of funding, California received \$58.4 billion for R&D. The next highest-ranking state was Michigan with \$16.5 billion. Together, the top five states accounted for 48 percent of total U.S. R&D funding.

These positive numbers aside, the outlook for aerospace R&D is unclear. Although R&D funding has increased steadily, it has trailed all other categories of defense spending. There is also the concern that the level of R&D spending in the aerospace industry will be reduced due to the increasing financial strains faced by both industry and government. Nevertheless, R&D spending remains a top priority for the aerospace industry, as history has proven that short-sighted cuts often produce long-term consequences for U.S. aerospace competitiveness.

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

Calendar Years 2003 – 2006
(Millions of Dollars)

Source of Funds	Total	Performer				
		Federal Government	Industry	Colleges & Universities	Federally Funded Research & Development Centers	Non-Profit Institutions
2003						
All Sources—TOTAL	\$ 289,024	\$ 22,752	\$ 203,182	\$ 40,456	\$ 7,301	\$ 15,333
Federal Government	83,595	22,752	20,256	25,106	7,301	8,180
Gov't, Non-Federal	2,740	-	-	2,740	-	-
Industry	186,173	-	182,926	2,129	-	1,118
Colleges & Universities	7,648	-	-	7,648	-	-
Nonprofit Institutions	8,868	-	-	2,833	-	6,035
2004						
All Sources—TOTAL	\$ 300,060	\$ 23,044	\$ 210,786	\$ 43,090	\$ 7,658	\$ 15,482
Federal Government	88,908	23,044	22,751	27,140	7,658	8,315
Gov't, Non-Federal	2,882	-	-	2,882	-	-
Industry	191,376	-	188,035	2,190	-	1,151
Colleges & Universities	7,932	-	-	7,932	-	-
Nonprofit Institutions	8,962	-	-	2,946	-	6,016
2005						
All Sources—TOTAL	\$ 323,546	\$ 24,744	\$ 228,549	\$ 45,831	\$ 7,786	\$ 16,636
Federal Government	94,635	24,744	24,555	28,944	7,786	8,606
Gov't, Non-Federal	2,993	-	-	2,993	-	-
Industry	207,556	-	203,994	2,311	-	1,251
Colleges & Universities	8,413	-	-	8,413	-	-
Nonprofit Institutions	9,949	-	-	3,170	-	6,779
2006(P)						
All Sources—TOTAL	\$ 342,888	\$ 24,408	\$ 244,235	\$ 49,091	\$ 7,720	\$ 17,434
Federal Government	96,848	24,408	24,942	31,223	7,720	8,555
Gov't, Non-Federal	3,164	-	-	3,164	-	-
Industry	223,042	-	219,293	2,400	-	1,349
Colleges & Universities	8,909	-	-	8,909	-	-
Nonprofit Institutions	10,925	-	-	3,395	-	7,530

Source: National Science Foundation, *Annual Survey of Industrial Research and Development*.

a. Source/performer detail not available by industry.

P. Preliminary.

FEDERAL OUTLAYS FOR CONDUCT OF RESEARCH AND DEVELOPMENT

Fiscal Years 1995 – 2009
(Millions of Dollars)

Year	Total	DoD	NASA	Energy ^a	Other ^b
Current Dollars					
1995	\$68,432	\$35,356	\$8,992	\$6,195	\$17,889
1996	68,439	36,936	8,083	6,135	17,285
1997	71,073	37,702	9,374	5,819	18,178
1998	72,803	37,558	9,881	5,971	19,393
1999	74,136	37,571	9,433	6,077	21,055
2000	73,947	38,279	6,369	6,282	23,017
2001	80,089	41,157	6,473	6,613	25,846
2002	87,911	44,903	6,772	6,830	29,406
2003	101,440	53,778	7,665	7,355	32,642
2004	113,379	61,510	8,588	7,923	35,358
2005	119,846	66,467	7,714	8,260	37,405
2006	122,795	69,323	7,529	7,842	38,101
2007	129,689	73,716	8,508	7,725	39,740
2008(E)	134,558	75,240	9,408	9,090	40,820
2009(E)	139,944	79,084	9,597	9,711	41,552
Constant Dollars^c					
1995	\$74,237	\$38,355	\$9,755	\$6,721	\$19,407
1996	72,846	39,315	8,604	6,530	18,398
1997	74,352	39,441	9,806	6,087	19,017
1998	75,249	38,820	10,213	6,172	20,044
1999	75,634	38,330	9,624	6,200	21,480
2000	73,947	38,279	6,369	6,282	23,017
2001	78,242	40,208	6,324	6,461	25,250
2002	84,271	43,044	6,492	6,547	28,188
2003	95,311	50,529	7,202	6,911	30,670
2004	103,827	56,328	7,864	7,255	32,379
2005	106,341	58,977	6,845	7,329	33,190
2006	105,467	59,540	6,467	6,735	32,724
2007	108,481	61,661	7,117	6,462	33,241
2008(E)	110,420	61,743	7,720	7,459	33,497
2009(E)	112,568	63,613	7,720	7,811	33,423

Source: Office of Management and Budget, *The Budget of the United States Government*.

a. Includes defense and nondefense-related atomic energy R&D with nondefense energy R&D.

b. Includes but not limited to NSF, National Institutes of Health, DoT, and Agriculture.

c. Based on Fiscal Year GDP deflator (2000=100).

E. Estimate.

FUNDS FOR INDUSTRIAL RESEARCH AND DEVELOPMENT IN ALL INDUSTRIES AND THE AEROSPACE INDUSTRY BY FUNDING SOURCE

Calendar Years 1992 – 2006
(Millions of Dollars)

Year	All Industries ^a			Aerospace Industry ^b		
	Total	Federal Funds	Company Funds ^c	Aerospace Total	Aerospace Federal Funds	Aerospace Company Funds
Current Dollars						
1992	\$119,110	\$24,722	\$94,388	\$17,158	\$10,287	\$6,871
1993	117,400	22,809	94,591	15,056	9,372	5,684
1994	119,595	22,463	97,131	14,260	8,794	5,466
1995	132,103	23,451	108,652	16,951	11,462	5,489
1996	144,667	23,653	121,015	16,224	10,515	5,710
1997	157,539	23,928	133,611	17,865	10,904	6,961
1998	169,180	24,164	145,016	16,359	9,838	6,521
1999	184,129	22,535	161,594	14,425	9,117	5,309
2000	201,962	19,118	182,844	10,319	6,424	3,895
2001	202,017	16,899	185,118	7,868	3,785	4,083
2002	193,868	16,401	177,467	9,654	4,306	5,349
2003	200,724	17,798	182,926	15,731	7,528	8,203
2004	208,301	20,266	188,035	13,086	3,862	9,224
2005	226,159	21,909	204,250	15,004	4,076	10,928
2006	247,669	24,304	223,365	16,367	4,372	11,995
Constant Dollars^d						
1992	\$133,967	\$24,722	\$109,245	\$19,859	\$11,906	\$7,953
1993	129,812	22,809	107,003	17,032	10,602	6,430
1994	130,028	22,463	107,565	15,792	9,739	6,053
1995	141,423	23,451	117,972	18,405	12,445	5,960
1996	152,529	23,653	128,876	17,278	11,198	6,081
1997	163,981	23,928	140,053	18,726	11,430	7,297
1998	174,440	24,164	150,276	16,952	10,195	6,758
1999	187,595	22,535	165,060	14,734	9,313	5,423
2000	201,962	19,118	182,844	10,319	6,424	3,895
2001	197,282	16,503	180,779	7,684	3,696	3,987
2002	186,056	15,742	170,314	9,265	4,132	5,133
2003	188,643	16,727	171,916	14,784	7,075	7,709
2004	190,301	18,520	171,781	11,955	3,528	8,427
2005	200,132	19,434	180,698	13,274	3,606	9,668
2006	212,376	20,936	191,440	14,028	3,747	10,281

Source: National Science Foundation, *Annual Survey of Industrial Research and Development*.

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

b. Companies classified in NAICS code 3364, having as their principal activity the manufacture of aerospace products and parts. Prior to 1999, data categorized using SIC system and reported combining codes 372 and 376.

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 R&D contracted to outside organizations such as research institutions, universities and colleges, or other non-profit organizations.

d. Based on GDP deflator (2000=100).

**FUNDS FOR INDUSTRIAL RESEARCH AND DEVELOPMENT
IN THE AEROSPACE INDUSTRY BY TYPE OF RESEARCH
AND FUNDING SOURCE**

Calendar Years 1974 – 2006
(Millions of Dollars)

Year	Total	Basic Research			Applied Research			Development		
		Total	Federal Funds	Com- pany Funds	Total	Federal Funds	Com- pany Funds	Total	Federal Funds	Com- pany Funds
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	(D)	(D)	3,466	(D)	(D)	10,241	7,668	2,573
1984	16,033	247	(D)	(D)	3,067	(D)	(D)	12,718	9,870	2,848
1985	17,619	304	162	142	3,785	2,776	1,009	13,530	10,483	3,047
1986	21,050	311	208	103	3,198	1,571	1,627	17,541	13,205	4,336
1987	24,488	425	335	90	2,949	1,709	1,239	21,115	16,475	4,640
1988	25,900	366	263	104	2,997	1,915	1,082	22,537	17,700	4,838
1989	25,638	668	553	116	3,081	2,113	968	21,889	16,967	4,921
1990	25,356	658	519	139	3,340	1,931	1,409	21,358	16,766	4,592
1991	16,983	364	302	62	2,091	1,105	986	14,528	10,043 (b)	4,485
1992	17,158	270	235	35	1,739	976	763	15,148	9,076	6,072
1993	15,056	(D)	(D)	(D)	1,453	825	628	(D)	(D)	(D)
1994	14,260	(D)	(D)	(D)	(D)	(D)	(D)	12,787	7,978	4,809
1995	16,951	252	250	2	1,987	564	1,423	14,712	10,648	4,064
1996	16,224	(D)	(D)	108	(D)	(D)	(D)	13,259	9,264	3,995
1997	17,865 (c)	(D)	(D)	10	(D)	(D)	1,508	13,275	9,115	4,159
1998	16,359 (c)	(D)	(D)	172	(D)	(D)	272	12,800	8,136	4,664
1999	14,425	(D)	(D)	173	(D)	(D)	655	11,541	7,060	4,480
2000	10,319	(D)	(D)	(D)	(D)	(D)	(D)	6,766	3,931	2,835
2001	7,868	(D)	(D)	301	1,639	735	904	(D)	(D)	2,877
2002	9,654	(D)	(D)	347	(D)	(D)	1,092	7,268	3,358	3,910
2003	15,731	725	417	308	3,234	2,456	778	11,772	4,655	7,117
2004	13,086	465	(D)	(D)	2,582	(D)	(D)	10,039	1,895	8,143
2005	15,005	510	(D)	(D)	2,783	(D)	(D)	11,712	2,143	9,569
2006	16,367	604	155	449	3,361	1,944	1,417	12,402	2,273	10,129

Source: National Science Foundation, *Annual Survey of Industrial Research and Development*.

- a. Break-outs by Research Type and Funding Source available only for odd-numbered years between 1977 and 1983.
- b. Computed by AIA as difference between total and company funds. Figure withheld by NSF because of imputation of more than 50 percent.
- c. Funding by type of research not revised nor published despite revised totals.
- d. Suppressed by NSF to avoid disclosure of confidential information.

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

Calendar Years 1982 – 2006

Year	All Manufacturing Industries ^a		Aerospace Industry ^b	
	Total Funds	Company Funds	Total Funds	Company Funds
1982	3.8%	2.6%	17.1%	5.1%
1983	3.9	2.6	15.2	4.1
1984	3.9	2.6	15.4	4.0
1985	4.4	3.0	14.9	3.9
1986	4.7	3.2	13.4	4.0
1987	4.6	3.1	14.7	3.6
1988	4.5	3.1	16.3	3.9
1989	4.3	3.1	13.5	3.3
1990	4.2	3.1	11.8	3.1
1991	4.2	3.2	12.1	4.0
1992	4.2	3.3	11.8	4.7
1993	3.8	3.1	12.5	4.7
1994	3.6	2.9	13.8	5.3
1995	3.6	2.9	12.9	4.2
1996	4.0	3.3	12.9	4.5
1997	3.9	3.3	8.4	3.3
1998	3.7	3.2	7.2	2.9
1999	3.8	3.2	8.8	3.2
2000	3.6	3.2	7.3	2.8
2001	4.1	3.7	5.7	3.0
2002	3.7	3.3	4.1	2.3
2003	3.5	3.1	6.8	3.5
2004	3.8	3.4	5.7	4.0
2005	4.0	3.6	6.6	4.8
2006	4.0	3.6	6.7	4.9

Source: National Science Foundation, *Annual Survey of Industrial Research and Development*.

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

b. Companies classified in NAICS code 3364, having as their principal activity the manufacture of aerospace products and parts. Prior to 1999, data categorized using SIC system and reported combining codes 372 and 376.

TOTAL R&D FUNDING FOR TOP STATES
(Millions of Dollars)

State	2004	2005	2006	Percent Change, 2005-06
United States:	\$208,301	\$226,159	\$247,669	9.5%
California	46,614	50,683	58,424	15.3
Michigan	15,170	16,752	16,477	(1.6)
Massachusetts	11,819	13,342	15,562	16.6
New Jersey	10,993	13,214	14,606	10.5
Texas	10,992	12,438	13,334	7.2
Washington	8,840	9,736	11,320	16.3
Illinois	8,554	9,712	10,765	10.8
Pennsylvania	8,005	8,846	9,819	11.0
New York	8,793	9,474	9,518	0.5
Connecticut	7,177	7,885	8,273	4.9
Ohio	5,516	5,900	6,852	16.1
Minnesota	5,199	6,340	6,296	(0.7)
North Carolina	4,565	5,158	5,486	6.4
Indiana	4,208	4,610	4,858	5.4
Virginia	4,006	4,379	4,816	10.0
Colorado	4,008	4,299	4,657	8.3
Florida	3,486	4,164	4,139	(0.6)
Arizona	2,570	2,980	3,590	20.5
Maryland	3,826	3,706	3,421	(7.7)
Oregon	3,057	3,252	3,419	5.1
Wisconsin	2,645	2,729	3,020	10.7
Georgia	2,160	2,282	2,786	22.1
Missouri	2,151	2,602	2,675	2.8
Kansas	1,804	1,993	2,064	3.6
Alabama	1,227	1,417	1,835	29.5
New Hampshire	1,330	1,435	1,774	23.6
Delaware	1,059	1,511	1,446	(4.3)
Tennessee	1,630	1,246	1,428	14.6
South Carolina	961	1,402	1,396	(0.4)
Rhode Island	1,320	1,387	1,330	(4.1)

Source: National Science Foundation, *Annual Survey of Industrial Research and Development*.

() Indicates negative growth.

FEDERAL AERONAUTICS RESEARCH AND DEVELOPMENT

Fiscal Years 1993 – 2007
(Millions of Dollars)

Year	Total	NASA^a	DoD^b	DoT^c
BUDGET AUTHORITY				
1993	\$11,359	\$1,245	\$7,582	\$2,532
1994	10,703	1,546	6,848	2,309
1995	10,718	1,310	7,196	2,212
1996	10,159	1,315	6,792	2,052
1997	9,721	1,252	6,323	2,146
1998	9,682	1,327	6,256	2,099
1999	8,997	1,194	5,532	2,271
2000	9,848	1,060	6,587	2,201
2001	9,867	926	6,149	2,792
2002	10,932	997	6,995	2,940
2003	13,360	1,004	9,432	2,924
2004	14,339	1,057	10,301	2,981
2005	12,927	962	9,327	2,638
2006	12,824	893	9,295	2,636
2007	14,963	717	11,614	2,632
OUTLAYS				
1993	\$11,162	\$1,212	\$7,572	\$2,378
1994	11,137	1,330	7,203	2,604
1995	11,155	1,153	7,132	2,870
1996	10,837	1,187	6,974	2,676
1997	10,430	1,302	6,600	2,528
1998	10,122	1,339	6,354	2,429
1999	9,499	1,217	5,913	2,369
2000	9,577	1,014	6,320	2,243
2001	9,735	867	6,297	2,571
2002	10,410	956	6,655	2,799
2003	12,127	974	8,314	2,839
2004	13,479	919	9,687	2,873
2005	13,095	866	9,586	2,643
2006	12,700	722	9,346	2,632
2007	13,680	614	10,640	2,426

Source: NASA, *Aeronautics and Space Report of the President*.

a. Research and Development, Construction of Facilities, Research and Program Management.

b. Research, Development, Test, and Evaluation of aircraft and related equipment.

c. Federal Aviation Administration: Research, Engineering, and Development; and Facilities, Engineering, and Development.

**DEPARTMENT OF DEFENSE OUTLAYS
FOR RESEARCH, DEVELOPMENT, TEST, AND EVALUATION**

**Fiscal Years 1980 – 2009
(Millions of Dollars)**

Year	TOTAL	Air Force	Army	Navy	Other
1980	\$13,127	\$5,017	\$2,707	\$4,381	\$1,021
1981	15,278	6,341	2,958	4,783	1,196
1982	17,729	7,794	3,230	5,240	1,465
1983	20,554	9,182	3,658	5,854	1,861
1984	23,117	10,353	3,812	6,662	2,289
1985	27,103	11,573	3,950	8,054	3,527
1986	32,283	13,417	3,984	9,667	5,215
1987	33,596	13,347	4,721	9,176	6,352
1988	34,792	14,302	4,624	8,828	7,038
1989	37,002	14,912	4,966	9,291	7,833
1990	37,458	14,443	5,513	9,160	8,342
1991	34,566	13,050	5,559	7,586	8,371
1992	34,632	11,998	5,978	7,826	8,830
1993	36,968	12,338	6,218	8,944	9,467
1994	34,786	12,513	5,746	7,990	8,537
1995	34,710	12,052	5,081	9,230	8,347
1996	36,561	13,056	4,925	9,404	9,175
1997	37,027	14,040	4,859	8,220	9,908
1998	37,420	14,499	4,881	7,836	10,204
1999	37,363	14,172	5,027	8,052	10,112
2000	37,606	13,839	4,777	8,857	10,133
2001	40,599	14,310	5,837	9,465	10,987
2002	44,389	14,228	6,569	10,360	13,232
2003	53,098	17,271	7,041	12,192	16,594
2004	60,756	19,529	8,302	14,136	18,789
2005	65,694	20,640	9,702	16,039	19,313
2006	68,628	20,870	10,846	17,423	19,489
2007	73,136	22,919	11,364	18,752	20,101
2008(E)	74,385	24,268	11,519	18,185	20,413
2009(E)	76,353	26,097	10,933	18,843	20,480

Source: Office of Management and Budget, *The Budget of the United States Government*.

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

**Fiscal Years 2006 – 2009
(Millions of Dollars)**

	2006	2007	2008(E)	2009(E)
TOTAL	\$72,691	\$77,589	\$76,884	\$79,616
BY APPROPRIATION				
Army	\$11,683	\$11,354	\$12,045	\$10,524
Navy	18,970	19,724	17,799	19,337
Air Force	22,191	24,492	26,219	28,067
Defense Agencies	19,682	21,839	20,643	21,499
Operational Test & Evaluation	166	180	178	189
RECAP OF BUDGET ACTIVITIES				
Basic Research	\$1,457	\$1,525	\$1,784	\$1,699
Applied Research	4,948	5,103	5,058	4,245
Adv. Technology Dvlp.	6,866	6,211	5,987	5,532
Adv. Component Dvlp. & Prototypes	13,789	15,925	15,557	15,774
System Development & Demonstration	18,955	19,119	18,184	19,537
RDT&E Management Support	5,263	5,466	4,491	4,369
Operational Systems Development	21,412	24,240	25,823	28,461
RECAP OF FYDP PROGRAMS				
Strategic Forces	\$387	\$651	\$754	\$646
General Purpose Forces	4,938	5,691	5,025	6,200
Intelligence and Communications	14,317	15,951	17,786	19,648
Mobility Forces	758	681	1,039	678
R&D (FYDP Program 6)	51,149	53,398	51,194	51,493
Central Supply and Maintenance	341	444	463	407
Training Medical and Other	21	8	8	8
Admn. and Associated Activities	177	176	163	178
Support of Other Nations	28	47	35	32
Special Operations Forces	575	542	417	326

Source: Department of Defense Budget, *RDT&E Programs (R-1)*.
E. Estimate.

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

**Fiscal Years 2003 – 2007
(Millions of Dollars)**

Program Categories	2003	2004	2005	2006	2007
TOTAL:	<u>\$33,069</u>	<u>\$32,564</u>	<u>\$37,099</u>	<u>\$39,423</u>	<u>\$40,162</u>
Research	3,841	3,744	4,898	5,121	5,842
Exploratory Development	3,664	3,700	4,014	4,125	4,766
Other Development / Support	25,564	25,120	28,186	30,176	29,554
Aircraft:					
Total	<u>\$8,104</u>	<u>\$8,489</u>	<u>\$8,732</u>	<u>\$9,445</u>	<u>\$8,575</u>
Research	534	519	405	308	517
Exploratory Development	343	486	371	304	327
Other Development / Support	7,219	7,484	7,957	8,833	7,731
Missile and Space Systems:					
Total	<u>\$6,923</u>	<u>\$7,365</u>	<u>\$7,567</u>	<u>\$6,392</u>	<u>\$7,966</u>
Research	347	331	390	468	621
Exploratory Development	1,355	970	900	792	711
Other Development / Support	5,220	6,065	6,277	5,133	6,634
Electronics and					
Communications Equipment:					
Total	<u>\$3,780</u>	<u>\$3,957</u>	<u>\$4,778</u>	<u>\$4,724</u>	<u>\$6,107</u>
Research	430	412	426	429	545
Exploratory Development	505	649	687	776	927
Other Development / Support	2,844	2,896	3,665	3,519	4,635
All Other:^a					
Total	<u>\$14,262</u>	<u>\$12,754</u>	<u>\$16,022</u>	<u>\$18,861</u>	<u>\$17,514</u>
Research	2,520	2,482	3,678	3,916	4,159
Exploratory Development	1,461	1,596	2,056	2,253	2,800
Other Development / Support	10,280	8,676	10,288	12,692	10,555

Source: Department of Defense, *Prime Contract Awards by Service Category and Federal Supply Classification*.

a. "All Other" includes ships, tank-automotive, weapons, ammunition, services, and other.

Federal Contracts for Research & Development

Fiscal Year 2007
(Millions of Dollars)

State	TOTAL	State	TOTAL
Alabama	\$3,533.3	Nevada	\$48.8
Alaska	92.6	New Hampshire	164.3
Arizona	1,190.9	New Jersey	1,229.8
Arkansas	22.3	New Mexico	346.0
California	11,087.4	New York	1,505.6
Colorado	1,108.9	North Carolina	399.5
Connecticut	1,359.7	North Dakota	15.5
Delaware	39.0	Ohio	1,326.9
District of Columbia	707.7	Oklahoma	127.5
Florida	1,126.1	Oregon	207.4
Georgia	284.2	Pennsylvania	1,321.4
Hawaii	115.5	Rhode Island	37.6
Idaho	14.0	South Carolina	82.5
Illinois	329.9	South Dakota	10.5
Indiana	309.3	Tennessee	401.6
Iowa	216.4	Texas	6,024.4
Kansas	275.4	Utah	301.2
Kentucky	83.8	Vermont	21.8
Louisiana	91.3	Virginia	4,174.3
Maine	319.4	Washington	1,577.2
Maryland	2,905.2	West Virginia	69.9
Massachusetts	4,272.3	Wisconsin	197.4
Michigan	425.7	Wyoming	8.2
Minnesota	212.6	50 States—	
Mississippi	379.4	Total	\$53,525.7
Missouri	3,327.8	Puerto Rico	6.5
Montana	24.8	Other	1,543.0
Nebraska	72.1	TOTAL	\$55,075.2

Top Research and Development Products

Defense Aircraft Development	\$6,405.1
Defense Missile and Space Systems	3,384.7
Other Defense	2,983.3
Other Research and Development	2,781.4
Space Science and Applications	1,913.8

Source: Aerospace Industries Association, based on data from www.USAspending.gov.

**MILITARY AIRCRAFT PROGRAMS
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION^a
BY AGENCY AND MODEL**

**Fiscal Years 2007, 2008, and 2009
(Millions of Dollars)**

Agency and Model	2007	2008(E)	2009(E)
AIR FORCE			
A-10	\$42.5	\$2.0	\$0.0
B-1B Lancer	153.8	152.2	128.9
B-2 Spirit	214.6	295.9	351.4
B-52 Stratofortress	88.4	42.1	38.7
C-5 Galaxy	137.6	179.0	125.1
C-17 Globemaster III	170.5	180.6	236.0
C-130J Hercules	220.3	323.8	224.9
CSAR-X	0.0	0.0	305.1
E-3 AWACS	157.8	151.6	126.3
E-8C JSTARS(d)	214.3	113.2	125.4
*E-10	351.9	39.0	42.2
F-15E Eagle	134.3	114.5	184.2
F-16 Falcon	124.8	70.2	124.0
F-22 Raptor	459.5	607.5	700.3
F-35 JSF(c)	4,183.4	3,859.6	3,056.8
KC-135 replacement	69.4	272.4	7.1
ARMY			
OH-58D Kiowa	\$217.2	\$181.1	\$135.7
DEFENSE AIRBORNE RECONNAISSANCE OFFICE			
UAVs(b)	\$716.9	\$758.5	\$1,175.4
NAVY			
AV-8B Harrier	\$20.9	\$17.0	\$29.9
*CH-53X	338.1	388.4	570.5
EA-18G Growler	361.0	278.5	128.9
F/A-18E/F Hornet	38.9	49.6	71.2
H-1 Super Cobra	33.5	3.5	3.8
P-3 Modernization/MMA	1,119.6	866.8	1,135.6
V-22 Osprey(c)	264.3	154.9	125.6
*VH-71 Executive Helo	613.9	225.4	1,047.8

Source: Department of Defense Budget, *Research, Development, Test & Evaluation Programs (R-1)*.

Note: See Aircraft Production Chapter for aircraft program procurement authorization data.

a. Total Obligational Authority.

b. Air Force, Navy, and Army funding.

c. Air Force and Navy funding.

d. Includes Air Force and NATO JSTARS.

E. Estimate

* Programs in R&D only.

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

Calendar Years 1983 – 2007

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
1983	540.9	103.1	19.1%	\$116,000	\$143,600
1984	584.1	111.5	19.1	124,000	156,000
1985	622.5	130.2	20.9	130,200	161,700
1986	671.0	144.8	21.6	128,500	149,800
1987	695.8	136.3	19.6	128,800	180,400
1988	708.6	136.4	19.2	132,300	193,300
1989	722.5	134.8	18.7	134,500	207,300
1990	743.6	115.3	15.5	141,300	213,700
1991	773.4	100.2	13.0	148,600	177,000
1992	779.3	92.9	11.9	157,912	180,552
1993	764.7	97.9	12.8	153,336	176,450
1994	768.5	72.8	9.5	157,459	186,898
1995	746.1	63.5	8.5	167,339	213,328
1996	832.8	95.5	11.5	168,362	170,733
1997	885.7	94.6	10.7	171,499	208,217
1998	951.5	77.0	8.1	173,589	228,159
1999	997.7	66.4	6.7	180,989	237,058
2000	1,037.0	55.3	5.3	193,719	256,692
2001	1,048.1	25.1	2.4	190,654	356,018
2002	1,071.1	19.1	1.8	180,628	374,186
2003	1,075.5	32.5	3.0	179,901	430,097
2004	1,156.0	40.6	3.5	183,744	333,401
2005	1,111.3	37.9	3.4	217,483	379,164
2006	1,097.7	41.5	3.8	235,208	419,381
2007	1,135.5	37.5	3.3	NA	NA

Source: National Science Foundation.

- Employment as of January. Scientists and engineers working less than full time have been included in terms of their full time equivalent number.
- All manufacturing industries and those non-manufacturing industries known to conduct or finance research and development.
- Companies classified in NAICS code 3364, having as their principal activity the manufacture of aerospace products and parts. Prior to 1999, data categorized using SIC system and reported combining codes 372 and 376.
- 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.

FOREIGN TRADE



F-35 Lightning II (Lockheed Martin Photo)

The record-breaking pace of U.S. aerospace export growth continued in 2007. The industry's foreign sales remained on an upward trend for the fourth consecutive year. The industry's trade balance improved nearly two-fold since 2004, and topped all-time highs the last two years in a row.

In 2007, U.S. aerospace exports made a significant contribution to reducing the U.S. merchandise trade deficit by offsetting deficits in other areas of trade. U.S. aerospace exports increased over the previous year by more than 14 percent and topped \$97 billion, a figure that represents 8.4 percent of all U.S. merchandise exports. Concurrently, U.S. aerospace imports continued to steadily climb, reaching a record \$36.6 billion.

U.S. aerospace companies have successfully developed an increasingly diverse, more geographically balanced clientele in recent years, primarily to reduce their reliance on any one market. Consequently, foreign trade has grown increasingly important to the industry. In 2007, foreign customers bought American-made aircraft, engines, and parts in record numbers, attracted by factors including favorable exchange rates and credit terms.

While 2007 was a record year for both U.S. aerospace exports and imports, the export gain far outstripped the import increase, resulting in a positive trade balance of almost \$61 billion. This surplus, the largest of



Hawker 4000 (Hawker Beechcraft Photo)

any manufacturing industry, helped offset the record 2006 total merchandise trade deficit. In 2007, the overall balance improved by some \$23 billion, of which roughly 25 percent was attributable to the surge in aerospace exports.

As is usual, civil aerospace exports accounted for most of the export volume (86.4 percent). In 2007, civil exports totaled \$84 billion, up nearly 17 percent from 2006. By value, nearly half of the 2007 civil export total was in commercial transport aircraft. Military exports retreated slightly from 2006's record high, to \$13.2 billion.



B-747 Civil Transport (Boeing Photo)

A breakdown of civil exports shows sales of complete aircraft of all types at \$47.6 billion (up 20.5 percent); aircraft and engine parts at \$28.5 billion (up 11.3 percent); and aircraft engines at \$7.1 billion (up 14.9 percent).

As reported by the Department of Commerce, total U.S. exports of military products, including aerospace, tanks and other armored fight vehicles, and assorted military weapons registered \$16.7 billion in 2007. Leading countries of destination for these products included key U.S. allies such as South Korea, Japan, Israel, Poland, and the United Kingdom.



C-130J Super Hercules (Lockheed Martin Photo)

Japan remained the largest market for U.S. aerospace products, buying goods valued at \$8.4 billion. Japan's last successful commercial aircraft program was discontinued in 1973, and the country now imports aircraft primarily from the United States.

The next largest export market was France, followed by China, the United Kingdom, and India. India imported \$6.2 billion worth of U.S. aerospace products in 2007, a 260 percent increase from the previous year. India's burgeoning

middle class is driving the market's expansion, as rapidly rising passenger traffic has led to several new low-cost airlines.

Asia was the largest market for U.S. commercial transport aircraft in 2007, growing 26 percent to 180 aircraft. Europe imported 117 U.S.-manufactured commercial transport aircraft, up from 67 a year earlier. As far as U.S. helicopter exports, Europe remained the most important market, importing 407 aircraft in 2007. Island-bound Oceania in particular relies on U.S. helicopters to navigate the region, and as such, purchased 199 aircraft.

The U.S. Export-Import Bank authorized \$4.5 billion in guarantees to support exports of 75 jet aircraft in 2007, the highest level of commitment since 1999. As obtaining credit becomes increasingly problematic in 2008 and beyond, the Export-Import Bank is likely to step up its financing of U.S. aircraft for foreign orders. Sovereign wealth funds and regional banks from Middle Eastern and Asian countries are also expected to progressively provide more aircraft financing.



KC-767 Aerial Refueling Tanker for Italian Air Force
(Boeing Photo)

Germany. France, Canada, the United Kingdom, Japan, and Germany remained the top five foreign suppliers of aerospace goods, responsible for 77 percent of all U.S. aerospace imports.

Parts (aircraft and engine) accounted for the bulk of U.S. aerospace imports (\$18.5 billion), although transport and general aviation aircraft, valued at \$6.9 billion and \$4.5 billion, respectively, were also imported in 2007. The U.S. also imported 306 civil helicopters, mainly from Canada, France, and

In the near-future, U.S. exports of aerospace products will be affected by the 2008 Boeing work-stoppage. Foreign orders for large civil aircraft account for more than three-fourths of the current backlog. Consequently, production delays will likely affect export levels.

U.S. TOTAL AND AEROSPACE FOREIGN TRADE

Calendar Years 1978 – 2007

(Millions of Dollars)

Year	Total U.S. Merchandise Trade			Aerospace		
	Trade Balance	Exports	Imports	Trade Balance	Exports	Imports
1978	(\$30,205)	\$145,847	\$176,052	\$9,058	\$10,001	\$943
1979	(23,922)	186,363	210,285	10,123	11,747	1,624
1980	(19,696)	225,566	245,262	11,952	15,506	3,554
1981	(22,267)	238,715	260,982	13,134	17,634	4,500
1982	(27,510)	216,442	243,952	11,035	15,603	4,568
1983	(52,409)	205,639	258,048	12,619	16,065	3,446
1984	(106,703)	223,976	330,678	10,082	15,008	4,926
1985	(117,712)	218,815	336,526	12,593	18,725	6,132
1986	(138,279)	227,159	365,438	11,826	19,728	7,902
1987	(152,119)	254,122	406,241	14,575	22,480	7,905
1988	(118,526)	322,426	440,952	17,860	26,947	9,087
1989	(109,399)	363,812	473,211	22,083	32,111	10,028
1990	(101,718)	393,592	495,311	27,282	39,083	11,801
1991	(66,723)	421,730	488,453	30,785	43,788	13,003
1992	(84,501)	448,164	532,665	31,356	45,018	13,662
1993	(115,568)	465,091	580,659	27,235	39,418	12,183
1994	(150,630)	512,626	663,256	25,010	37,373	12,363
1995	(158,801)	584,742	743,543	21,561	33,071	11,509
1996	(170,214)	625,075	795,289	26,602	40,270	13,668
1997	(180,522)	689,182	869,704	32,239	50,374	18,134
1998	(229,758)	682,138	911,896	40,960	64,071	23,110
1999	(328,821)	695,797	1,024,618	37,381	62,444	25,063
2000	(436,104)	781,918	1,218,022	26,734	54,679	27,944
2001	(411,899)	729,100	1,140,999	26,035	58,508	32,473
2002	(468,263)	693,103	1,161,366	29,533	56,775	27,242
2003	(532,350)	724,771	1,257,121	27,111	52,504	25,393
2004	(650,930)	818,775	1,469,704	31,002	56,817	25,815
2005	(767,477)	905,978	1,673,455	39,783	67,432	27,649
2006	(817,304)	1,036,635	1,853,938	54,809	85,262	30,453
2007	(794,483)	1,162,479	1,956,962	60,614	97,224	36,610

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

TOTAL U.S. EXPORTS AND EXPORTS OF AEROSPACE PRODUCTS

Calendar Years 1978 – 2007
(Millions of Dollars)

Year	Total Exports of U.S. Merchandise ^a	Exports of Aerospace Products				
		TOTAL	Percent of Total U.S. Exports	Civil		Military
				Total	Transports	
1978	\$145,847	\$10,001	6.9%	\$6,018	\$2,558	\$3,983
1979	186,363	11,747	6.3	9,772	4,998	1,975
1980	225,566	15,506	6.9	13,248	6,727	2,258
1981	238,715	17,634	7.4	13,312	7,180	4,322
1982	216,442	15,603	7.2	9,608	3,834	5,995
1983	205,639	16,065	7.8	10,595	4,683	5,470
1984	223,976	15,008	6.7	9,659	3,195	5,350
1985	218,815	18,725	8.6	12,942	5,518	5,783
1986	227,159	19,728	8.7	14,851	6,276	4,875
1987	254,122	22,480	8.8	15,768	6,377	6,714
1988	322,426	26,947	8.4	20,298	8,766	6,651
1989	363,812	32,111	8.8	25,619	12,313	6,492
1990	393,592	39,083	9.9	31,517	16,691	7,566
1991	421,730	43,788	10.4	35,548	20,881	8,239
1992	448,164	45,018	10.0	36,906	22,379	8,111
1993	465,091	39,418	8.5	31,823	18,146	7,596
1994	512,626	37,373	7.3	30,050	15,931	7,322
1995	584,742	33,071	5.7	25,079	10,606	7,991
1996	625,075	40,270	6.4	29,477	13,624	10,792
1997	689,182	50,374	7.3	40,075	21,028	10,299
1998	682,138	64,071	9.4	51,999	29,168	12,072
1999	695,797	62,444	9.0	50,624	25,694	11,820
2000	781,918	54,679	7.0	45,566	19,615	9,113
2001	729,100	58,508	8.0	49,371	22,151	9,137
2002	693,103	56,775	8.2	47,348	21,661	9,427
2003	724,771	52,504	7.2	44,366	19,434	8,138
2004	818,775	56,817	6.9	47,771	18,577	9,046
2005	905,978	67,432	7.4	57,588	21,888	9,844
2006	1,036,635	85,262	8.2	71,857	32,897	13,405
2007	1,162,479	97,224	8.4	83,977	40,297	13,247

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

Note: International trade reported using Harmonized Tariff Schedules after 1988.

a. Includes DoD shipments and undocumented exports to Canada, free alongside-ship basis.

U.S. EXPORTS OF AEROSPACE PRODUCTS^a **BY MAJOR COUNTRIES OF DESTINATION**

Calendar Years 2003 – 2007
(Millions of Dollars)

Country of Destination	2003	2004	2005	2006	2007
Australia	\$2,342	\$1,433	\$1,386	\$1,846	\$1,281
Brazil	1,368	2,273	2,142	3,436	4,698
Canada	3,147	3,615	4,342	4,452	5,862
China	2,653	2,130	4,481	6,304	7,481
France	3,782	6,044	6,125	6,695	7,901
Germany	2,726	2,728	3,486	4,477	5,419
Hong Kong	163	212	343	462	1,319
India	348	398	704	1,725	6,223
Ireland	1,004	1,660	2,442	2,094	2,658
Israel	920	1,409	1,420	1,579	1,818
Japan	5,953	6,120	6,649	7,403	8,376
Korea, South	2,025	2,201	2,464	4,025	3,841
Mexico	812	1,043	1,044	2,127	1,274
Netherlands	2,528	2,291	1,384	2,102	2,028
Poland	21	44	72	570	1,245
Singapore	3,328	3,351	3,788	4,931	4,163
Spain	532	748	933	703	1,008
Taiwan	1,272	1,640	2,662	1,949	2,043
United Arab Emirates	777	278	3,529	5,200	3,625
United Kingdom	4,702	4,188	5,094	5,418	6,778

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

a. Includes all civil products, free alongside-ship basis; excludes military products whose country of destination are not reported.

**U.S. IMPORTS OF AEROSPACE PRODUCTS^a
BY MAJOR COUNTRIES OF ORIGIN**

Calendar Years 2003 – 2007
(Millions of Dollars)

Country of Origin	2003	2004	2005	2006	2007
Brazil	\$1,878	\$2,504	\$1,816	\$1,218	\$1,738
Canada	7,547	6,908	7,653	6,902	8,744
China	105	158	171	255	368
France	6,346	5,818	5,357	7,513	9,475
Germany	1,877	2,225	3,118	2,739	2,643
Israel	561	584	738	961	1,304
Italy	417	501	658	716	937
Japan	1,410	1,553	1,882	2,498	3,068
Korea, South	203	239	366	456	515
Mexico	357	216	204	266	490
Netherlands	168	177	223	244	253
Singapore	124	155	188	203	284
Sweden	108	144	202	210	260
Switzerland	154	186	223	253	238
United Kingdom	3,075	3,000	3,326	4,008	4,235

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

a. Includes civil and military products, c.i.f. (Cost, Insurance, and Freight) basis.

U.S. EXPORTS OF AEROSPACE PRODUCTS

Calendar Years 2003 – 2007
(Millions of Dollars)

	2003	2004	2005	2006	2007
TOTAL	\$52,504	\$56,817	\$67,432	\$85,262	\$97,224
CIVIL — TOTAL	\$44,366	\$47,772	\$57,587	\$71,857	\$83,977
Complete Aircraft — TOTAL	<u>\$22,682</u>	<u>\$22,568</u>	<u>\$28,104</u>	<u>\$39,461</u>	<u>\$47,558</u>
Transports	19,434	18,577	21,888	32,897	40,297
General Aviation(a)	909	1,486	2,443	3,349	3,911
Helicopters	203	313	565	671	1,117
Other Aircraft	2,136	2,192	3,209	2,544	2,234
Aircraft Engines — TOTAL	<u>4,367</u>	<u>5,271</u>	<u>6,762</u>	<u>6,202</u>	<u>7,127</u>
Turbine Engines	4,244	5,081	6,564	6,032	6,953
Piston Engines	123	191	198	170	174
Aircraft and Engine Parts					
incl. Spares — TOTAL	<u>16,825</u>	<u>19,267</u>	<u>22,246</u>	<u>25,588</u>	<u>28,469</u>
Aircraft Parts & Accessories	10,914	12,095	14,160	16,165	17,570
Aircraft Engine Parts	5,911	7,172	8,086	9,423	10,899
Other Craft and Parts(b)	492	666	474	606	824
MILITARY — TOTAL	\$8,138	\$9,045	\$9,845	\$13,405	\$13,247
Complete Aircraft — TOTAL(c)	<u>\$746</u>	<u>\$2,289</u>	<u>\$2,392</u>	<u>\$4,464</u>	<u>\$4,174</u>
Fighters & Fighter Bombers	-	1,674	1,976	3,351	2,303
Transports	-	332	171	375	789
Helicopters	178	158	156	618	791
Other Aircraft	568	125	87	121	290
Aircraft Engines — TOTAL	<u>333</u>	<u>280</u>	<u>411</u>	<u>414</u>	<u>415</u>
Turbine Engines	229	198	302	312	277
Piston Engines	104	82	109	102	137
Aircraft and Engine Parts					
incl. Spares — TOTAL	<u>6,090</u>	<u>5,360</u>	<u>5,813</u>	<u>6,936</u>	<u>7,185</u>
Aircraft Parts & Accessories	4,588	4,443	4,723	5,770	5,916
Aircraft Engine Parts	1,502	918	1,091	1,165	1,269
Missiles, Rockets,					
Engines, and Parts	884	998	1,084	1,452	1,359
Other Craft and Parts(d)	85	117	146	139	114

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

Notes: Details include products not designated civil or military by the Harmonized Tariff Schedules. Historically, aircraft herein have been predominantly civil. Totals may not equal sum of details due to rounding.

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

b. Includes spacecraft, satellites, missiles, rockets, engines, and parts.

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

d. Includes spacecraft, satellites, and parts.

U.S. IMPORTS OF AEROSPACE PRODUCTS

Calendar Years 2003 – 2007
(Millions of Dollars)

	2003	2004	2005	2006	2007
TOTAL	\$25,393	\$25,815	\$27,649	\$30,453	\$36,610
CIVIL — TOTAL	\$23,788	\$23,983	\$25,158	\$27,843	\$33,684
Complete Aircraft — TOTAL	<u>\$12,329</u>	<u>\$11,645</u>	<u>\$10,851</u>	<u>\$10,772</u>	<u>\$13,284</u>
Transports	4,059	5,248	5,988	4,946	6,916
General Aviation	6,040	4,602	3,680	3,986	4,532
Helicopters	367	492	513	682	889
Other Aircraft	1,862	1,304	670	1,159	947
Aircraft Engines — TOTAL	<u>2,368</u>	<u>2,484</u>	<u>3,079</u>	<u>3,533</u>	<u>3,664</u>
Turbine Engines	2,340	2,470	3,024	3,467	3,621
Piston Engines	27	14	54	66	43
Aircraft and Engine Parts — TOTAL	<u>8,612</u>	<u>9,474</u>	<u>10,841</u>	<u>13,106</u>	<u>16,160</u>
Aircraft Parts & Accessories	3,991	4,114	4,731	5,968	7,586
Aircraft Engine Parts	4,621	5,360	6,110	7,137	8,574
Other Craft and Parts(a)	479	380	388	432	577
MILITARY — TOTAL	\$1,605	\$1,832	\$2,491	\$2,610	\$2,926
Complete Aircraft—TOTAL	\$5	\$10	\$40	\$2	\$12
Aircraft Engines — TOTAL	<u>146</u>	<u>145</u>	<u>193</u>	<u>206</u>	<u>217</u>
Turbine Engines	123	130	159	182	191
Piston Engines Including Parts	23	15	33	24	26
Aircraft and Engine Parts — TOTAL	<u>1,233</u>	<u>1,367</u>	<u>1,867</u>	<u>1,949</u>	<u>2,368</u>
Aircraft Parts	894	973	1,259	1,364	1,737
Aircraft Engine Parts	340	393	607	585	631
Missiles, Rockets, Engines, and Parts	117	149	269	310	286
Other Craft and Parts(b)	104	161	123	142	42

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

Notes: Details include products not designated civil or military by the Harmonized Tariff Schedules.

Historically, aircraft herein have been predominantly civil.

Totals may not equal sum of details due to rounding.

a. Includes spacecraft, satellites, missiles, rockets, engines, and parts.

b. Includes spacecraft, satellites, and parts.

U.S. EXPORTS OF MILITARY AIRCRAFT^a

Calendar Years 2003 – 2007

Type of Aircraft	2003	2004	2005	2006	2007
TOTAL NUMBER OF AIRCRAFT	203	256	308	747	690
Fighters and Fighter Bombers	–	54	67	88	51
Transports	–	5	4	8	10
Helicopters	48	60	140	508	374
New Aircraft, NEC	61	50	52	94	160
Used or Rebuilt Aircraft	94	87	45	49	95
VALUE (Millions of Dollars)	see page 128				

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

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

NEC. Not elsewhere classified.

U.S. EXPORTS OF CIVIL AIRCRAFT

Calendar Years 2003 – 2007

Type of Aircraft	2003	2004	2005	2006	2007
NUMBER OF AIRCRAFT	1,715	2,064	2,506	2,749	3,713
Helicopters — TOTAL	<u>399</u>	<u>567</u>	<u>707</u>	<u>686</u>	<u>901</u>
Under 2,200 lbs	356	500	622	585	777
Over 2,200 lbs	43	67	85	101	124
General Aviation — TOTAL	<u>349</u>	<u>355</u>	<u>591</u>	<u>702</u>	<u>1,088</u>
Single-Engine	182	159	270	295	587
Multi-Engine, under 4,400 lbs	49	31	73	95	125
Multi-Engine, 4,400-10,000 lbs	42	43	70	75	99
Multi-Engine, 10,000-33,000 lbs	76	122	178	237	277
Transports (over 33,000 lbs) — TOTAL	<u>214</u>	<u>198</u>	<u>242</u>	<u>321</u>	<u>384</u>
Passenger Aircraft	204	187	227	300	369
Cargo Aircraft	10	11	15	21	15
Other, incl. Pass./Cargo Combination	—	—	—	—	—
Other Aircraft — TOTAL	<u>753</u>	<u>944</u>	<u>966</u>	<u>1,040</u>	<u>1,340</u>
Used or Rebuilt Aircraft	753	944	966	1,040	1,340
Other Aircraft(a)	517	588	562	626	817
VALUE (Millions of Dollars)	\$22,656	\$22,540	\$28,080	\$39,428	\$47,521
Helicopters — TOTAL	<u>\$203</u>	<u>\$313</u>	<u>\$565</u>	<u>\$671</u>	<u>\$1,117</u>
Under 2,200 lbs	74	116	154	148	212
Over 2,200 lbs	129	197	411	523	905
General Aviation — TOTAL	<u>909</u>	<u>1,486</u>	<u>2,443</u>	<u>3,349</u>	<u>3,911</u>
Single-Engine	99	81	166	217	204
Multi-Engine, under 4,400 lbs	23	10	34	40	49
Multi-Engine, 4,400-10,000 lbs	172	156	278	311	448
Multi-Engine, 10,000-33,000 lbs	616	1,240	1,965	2,782	3,210
Transports (over 33,000 lbs) — TOTAL	<u>19,434</u>	<u>18,577</u>	<u>21,888</u>	<u>32,897</u>	<u>40,297</u>
Passenger Aircraft	17,340	16,196	18,821	28,630	37,154
Cargo Aircraft	2,094	2,382	3,067	4,266	3,143
Other, incl. Pass./Cargo Combination	—	—	—	—	—
Other Aircraft — TOTAL	<u>2,111</u>	<u>2,164</u>	<u>3,185</u>	<u>2,511</u>	<u>2,197</u>
Used or Rebuilt Aircraft	2,111	2,164	3,185	2,511	2,197
Other Aircraft(a)	26	28	24	33	37

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

a. Excluded from totals.

U.S. EXPORTS OF COMMERCIAL TRANSPORT AIRCRAFT^a

Calendar Years 2003 – 2007

<i>Region of Destination</i>	2003	2004	2005	2006	2007
NUMBER OF AIRCRAFT	210	194	237	321	384
Canada & Greenland	11	11	18	13	16
Latin America & Caribbean	11	14	14	35	31
Europe	73	87	69	67	117
Middle East	10	2	15	37	29
Asia	78	62	99	142	180
Oceania	19	12	11	13	6
Africa	8	6	11	14	5
VALUE (Millions of Dollars)	\$19,248.9	\$18,228.0	\$21,704.2	\$32,902.7	\$40,296.5
Canada & Greenland	\$372.8	\$372.4	\$757.0	\$688.4	\$1,490.0
Latin America & Caribbean	562.4	718.1	865.2	2,720.7	2,182.5
Europe	5,922.1	7,129.1	4,897.4	5,551.0	9,009.8
Middle East	1,040.9	77.5	2,377.9	5,265.0	4,448.6
Asia	9,231.7	8,642.1	10,860.9	16,082.3	22,080.6
Oceania	1,614.0	742.4	908.8	1,398.6	596.0
Africa	505.0	546.4	1,037.1	1,196.7	489.0

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

Notes: Totals may not equal sum of terms due to rounding. Previous years' data may have been revised to reflect updated and/or newly available information.

a. Airframe weight exceeding 33,000 pounds.

U.S. IMPORTS OF COMPLETE AIRCRAFT

Calendar Years 2003 – 2007

Use and Type	2003	2004	2005	2006	2007
NUMBER OF AIRCRAFT	2,389	2,117	2,148	2,505	2,539
Civil Aircraft — TOTAL	<u>2,379</u>	<u>2,079</u>	<u>2,115</u>	<u>2,495</u>	<u>2,513</u>
New Complete Aircraft:					
Helicopters	174	227	231	256	306
General Aviation:					
Single-Engine	334	251	313	394	388
Multi-Engine, under 4,400 lbs	1	1	—	37	81
Multi-Engine, 4,400-10,000 lbs	10	9	13	19	20
Multi-Engine, Turbojet / Turbofan, 10,000-33,000 lbs	320	241	186	195	224
Transports, Multi-Engine, over 33,000 lbs	124	163	189	140	187
Other New Civil Aircraft(a)	1,165	832	952	1,243	1,103
Used or Rebuilt	251	355	231	211	204
Military Aircraft — TOTAL	<u>10</u>	<u>38</u>	<u>33</u>	<u>10</u>	<u>26</u>
New Complete Aircraft	6	24	17	5	6
Used or Rebuilt	4	14	16	5	20
VALUE (Millions of Dollars)	\$12,334.0	\$11,654.7	\$10,890.8	\$10,774.5	\$13,296.2
Civil Aircraft — TOTAL	<u>\$12,329.0</u>	<u>\$11,644.7</u>	<u>\$10,850.8</u>	<u>\$10,772.4</u>	<u>\$13,283.9</u>
New Complete Aircraft:					
Helicopters	367.4	491.7	513.2	681.6	888.6
General Aviation:					
Single-Engine	205.7	228.8	255.5	334.4	302.8
Multi-Engine, under 4,400 lbs	0.3	0.1	—	17.5	37.7
Multi-Engine, 4,400-10,000 lbs	29.4	33.8	57.2	87.8	105.4
Multi-Engine, Turbojet / Turbofan, 10,000-33,000 lbs	5,805.0	4,338.8	3,367.0	3,546.6	4,086.2
Transports, Multi-Engine, over 33,000 lbs	4,059.2	5,247.7	5,988.2	4,945.8	6,916.1
Other New Aircraft(a)	12.2	12.5	17.9	35.0	34.1
Used or Rebuilt	1,849.9	1,291.3	651.8	1,123.6	913.1
Military Aircraft — TOTAL	<u>5.6</u>	<u>10.0</u>	<u>40.1</u>	<u>2.1</u>	<u>12.3</u>
New Complete Aircraft	5.0	3.9	39.2	0.2	0.8
Used or Rebuilt	0.6	6.1	0.8	1.9	11.5

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

Notes: Details include products not designated civil or military by the Harmonized Tariff Schedules. Historically, aircraft herein have been predominantly civil. Totals may not equal sum of details due to rounding.

a. Includes gliders, balloons and airships, and kites.

U.S. EXPORTS OF CIVIL HELICOPTERS^a

Calendar Years 2003 – 2007

<i>Region of Destination</i>	2003	2004	2005	2006	2007
NUMBER OF AIRCRAFT	399	567	707	686	901
Africa	56	46	78	88	76
Asia	32	38	44	43	84
Canada & Greenland	16	31	40	55	51
Europe	183	278	299	311	407
Latin America & Caribbean	22	28	42	65	73
Middle East	19	7	13	15	11
Oceania	71	139	191	109	199
VALUE (Millions of Dollars)	\$202.9	\$312.8	\$564.7	\$671.3	\$1,117.1
Africa	\$55.7	\$38.7	\$69.5	\$130.4	\$51.9
Asia	21.6	48.1	82.4	99.4	349.9
Canada & Greenland	18.8	37.9	57.8	55.4	38.8
Europe	64.3	99.7	217.4	240.1	514.4
Latin America & Caribbean	23.8	55.0	46.7	57.5	80.4
Middle East	0.5	10.2	57.2	36.1	22.8
Oceania	18.3	23.3	33.6	52.5	58.8

Source: Aerospace Industries Association, based on data from the Census Bureau.

Note: Sum of terms may not equal totals due to rounding.

a. Excludes used helicopters.

U.S. IMPORTS OF CIVIL HELICOPTERS^a

Calendar Years 2003 – 2007

<i>Country of Origin</i>	2003	2004	2005	2006	2007
NUMBER OF AIRCRAFT	174	227	231	258	306
Canada	82	86	96	118	136
France	62	80	61	68	80
Germany	13	22	28	52	69
Italy	15	23	33	19	13
Others	2	16	13	1	8
VALUE (Millions of Dollars)	\$367.4	\$491.7	\$513.2	\$686.3	\$888.6
Canada	\$194.8	\$239.5	\$221.1	\$287.0	\$434.9
France	100.6	107.1	73.8	87.7	110.2
Germany	35.9	72.5	92.2	184.2	245.7
Italy	35.8	70.6	123.8	127.4	95.4
Others	0.3	2.0	2.2	0.0	2.4

Source: Aerospace Industries Association, based on data from the U.S. Census Bureau.

a. Excludes used helicopters.

U.S. EXPORTS OF GENERAL AVIATION AIRCRAFT^a

Calendar Years 2003 – 2007

<i>Region of Destination</i>	2003	2004	2005	2006	2007
NUMBER OF AIRCRAFT	348	352	590	701	962
Canada & Greenland	29	18	30	49	42
Latin America & Caribbean	54	66	107	128	211
Europe	161	172	268	327	463
Middle East	5	18	51	40	54
Asia	24	14	47	61	65
Oceania	48	40	69	52	74
Africa	27	24	18	44	53
VALUE (Millions of Dollars)	\$904.2	\$1,469.1	\$2,449.5	\$3,348.1	\$4,039.5
Canada & Greenland	\$67.1	\$85.6	\$80.1	\$197.9	\$207.9
Latin America & Caribbean	162.1	373.2	480.3	495.2	684.8
Europe	442.1	807.2	1,361.3	1,998.5	2,212.4
Middle East	2.7	50.0	197.7	235.4	384.1
Asia	70.7	24.7	156.3	206.3	284.6
Oceania	77.9	63.2	89.3	122.2	127.3
Africa	81.7	65.2	84.5	92.6	138.3

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

Notes: Sum of terms may not equal totals due to rounding. Previous years' data may have been revised to reflect updated and/or newly available information.

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

U.S. IMPORTS OF GENERAL AVIATION AIRCRAFT^a

Calendar Years 2003 – 2007

<i>Country of Origin</i>	2003	2004	2005	2006	2007
NUMBER OF AIRCRAFT	664	543	503	640	713
Canada	320	272	274	292	336
France	100	42	34	100	93
Israel	20	19	25	42	58
Brazil	101	89	50	20	14
Switzerland	44	55	59	67	59
Italy	14	10	16	17	37
Spain	0	4	0	1	2
Czech Republic	14	13	11	46	40
Germany	30	15	15	20	28
Australia	7	10	14	24	31
Other	14	14	5	11	15
VALUE (Millions of Dollars)	\$6,038.2	\$4,583.7	\$3,555.6	\$3,958.3	\$4,532.1
Canada	\$3,077.9	\$2,144.4	\$1,924.3	\$1,419.0	\$1,898.1
France	986.0	367.6	161.7	1,405.8	1,428.2
Israel	189.6	198.3	279.5	447.5	618.7
Brazil	1,651.1	1,631.3	982.5	391.8	278.7
Switzerland	96.2	127.7	139.2	168.2	149.6
Italy	24.5	30.6	57.4	66.7	109.1
Spain	0.0	63.8	0.0	31.5	38.0
Czech Republic	2.4	0.3	0.8	2.5	3.7
Germany	2.8	12.5	3.2	4.8	5.0
Australia	1.3	2.6	5.8	3.6	1.1
Other	6.5	4.6	1.2	17.0	2.0

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

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

U.S. EXPORTS OF AIRCRAFT ENGINES

Calendar Years 2005 – 2007
(Values in Millions of Dollars)

Type of Engine	2005		2006		2007	
	Number	Value	Number	Value	Number	Value
TOTAL	34,912	\$7,173	36,702	\$6,616	57,014	\$7,541
Turbine Engines:						
Total	<u>16,289</u>	<u>\$6,866</u>	<u>19,859</u>	<u>\$6,344</u>	<u>15,401</u>	<u>\$7,230</u>
Civil	13,668	6,564	13,036	6,032	13,303	6,953
Military	2,621	302	6,823	312	2,098	277
Piston Engines:						
Total	<u>18,623</u>	<u>307</u>	<u>16,843</u>	<u>272</u>	<u>41,613</u>	<u>312</u>
Civil, New, under 500 HP	1,969	40	1,164	24	712	22
Civil, New, over 500 HP	1,323	18	549	13	1,379	25
Civil, Used	7,983	140	7,225	132	6,332	128
Military	7,348	109	7,905	102	33,190	137

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

U.S. IMPORTS OF AIRCRAFT ENGINES^a

Calendar Years 2005 – 2007
(Values in Millions of Dollars)

Type of Engine	2005		2006		2007	
	Number	Value	Number	Value	Number	Value
TOTAL	9,439	\$3,271	7,544	\$3,739	8,715	\$3,880
Turbine Engines						
Total	3,823	\$3,183	4,078	\$3,650	4,099	\$3,811
Civil	3,632	3,024	3,874	3,467	3,894	3,621
Military	191	159	204	182	205	191
Piston Engines						
Total	5,616	88	3,466	90	4,616	69
Civil, New, under 500 HP	501	2	438	3	616	5
Civil, New, over 500 HP	179	3	176	2	26	1
Civil, Used	2,735	49	926	61	1,804	37
Military	2,201	33	1,926	24	2,170	26

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

a. New and used.

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

Fiscal Years 1994 – 2007
(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					
1994	\$3,016	\$ —	— %	\$ —	\$ —
1995	1,598	—	—	—	—
1996	1,236	—	—	—	—
1997	1,549	—	—	—	—
1998	103	—	—	—	—
1999	903	590.8	65.4	590.8	—
2000	933	75.7	8.1	75.7	—
2001	871	—	—	—	—
2002	296	—	—	—	—
2003	58	5.6	9.6	—	5.6
2004	227	58.5	25.8	—	58.5
2005	—	—	—	—	—
2006	57	41.0	72.4	—	41.0
2007	—	—	—	—	—
GUARANTEES ^d					
1994	\$7,609	\$2,959.0	38.9%	\$2,959.0	\$ —
1995	5,712	977.0	17.1	977.0	—
1996	6,412	1,155.0	18.0	1,155.0	—
1997	7,761	1,959.0	25.2	1,959.0	—
1998	6,151	2,542.5	41.3	2,542.5	—
1999	8,299	5,543.8	66.8	5,543.8	—
2000	8,413	3,647.4	43.4	3,437.8	209.6
2001	6,101	2,736.5	44.8	2,540.5	196.0
2002	7,408	3,823.1	51.6	3,800.9	22.2
2003	7,745	4,647.7	60.3	4,419.9	227.8
2004	8,533	4,305.6	50.5	4,247.1	58.5
2005	9,572	4,446.9	46.5	4,365.4	81.5
2006	12,094	4,450.5	36.8	4,419.4	31.1
2007	12,569	4,515.4	35.9	4,507.6	7.8

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 direct financing by the Export-Import Bank to foreign buyers of U.S. equipment and services, 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.

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

Fiscal Years 1983 – 2007
(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
1983	21	9	\$779	\$619	3	4	\$384	\$601
1984	37	8	1023	327	7	4	532	294
1985	—	14	19	481	1	5	13	289
1986	3	13	74	451	1	9	46	277
1987	—	27	22	1,449	1	14	13	808
1988	—	2	—	94	—	2	—	73
1989	3	5	253	459	1	2	158	390
1990	—	6	—	264	—	2	—	225
1991	—	12	—	665	—	3	—	567
1992	—	37	—	1,889	—	12	—	1,597
1993	—	70	—	4,122	—	27	—	3,489
1994	—	59	—	3,507	—	19	—	2,959
1995	—	27	—	1,205	—	12	—	974
1996	—	18	—	1,089	—	8	—	923
1997	—	34	—	2,357	—	14	—	1,959
1998	—	65	—	3,059	—	24	—	2,543
1999	17	106	1170	6,464	2	32	591	5,544
2000	5	53	150	4,047	2	17	76	3,438
2001	—	60	—	3,052	—	12	—	2,540
2002	—	72	—	4,370	—	17	—	3,801
2003	—	74	—	5,083	—	22	—	4,420
2004	—	70	—	4,884	—	18	—	4,247
2005	—	78	—	4,886	—	25	—	4,365
2006	—	79	—	5,082	—	19	—	4,419
2007	—	75	—	5,184	—	14	—	4,508

Source: Export-Import Bank of the United States, and AIA estimates.

- a. Loans are commitments for direct financing by the Export-Import Bank to foreign buyers of U.S. equipment and services, which are made by the Export-Import Bank to commercial banks and which subsequently may be guaranteed by the Export-Import Bank in which case the value of the loans is included with Guarantees.
- b. Guarantees by the Export-Import Bank provide assurances of repayment of principal and interest on loans made by private lending institutions, such as commercial banks, for major export transactions. Excludes insurance.
- c. For Export-Import Bank commitments including both loan and guarantee authorization, number of aircraft and export value reported under "Loans."

EXPORT-IMPORT BANK
AUTHORIZATIONS OF LOANS AND GUARANTEES
IN SUPPORT OF EXPORTS OF COMMERCIAL JET AIRCRAFT
Fiscal Year 2007
(Values in Thousands of Dollars)

Customer (Country / Airline)	Principal Supplier	Authorizations	
		Loans	Long-Term Guarantees
		—	<u>\$4,587,035</u>
Austria	Austrian Airlines Lease and Finance Co.	—	\$106,568
Brazil	GOL Transportes Aereos S.A.	—	157,080
Canada	Air Canada	—	708,461
Canada	WestJet Airlines	—	105,940
Chile	Lan Airlines S.A.	—	142,356
Germany	Bavarian International Aircraft Leasing GMBH	—	49,280
India	Jet Airways Ltd.	—	4,159
India	Jet Airways Ltd.	—	885,996
Ireland	Ryanair Ltd.	—	221,150
Ireland	Ryanair Ltd.	—	393,975
Israel	El Al Airlines	—	227,630
Kenya	Kenya Airways Ltd.	—	111,524
Korea	Asiana Airlines	—	242,535
Morocco	Royal Air Maroc	—	81,510
Nigeria	Intercontinental Bank PLC	—	71,824
Pakistan	Pakistan International Airlines	—	468,279
Panama	Copa Holdings S.A.	—	31,404
Saudi Arabia	National Air Service Company Ltd.	—	7,811
UAE	Emirates	—	246,891
Miscellaneous	ACG Capital Group Corp.	—	60,749
Miscellaneous	Pegasus Aviation	—	68,753
Miscellaneous	Pegasus Aviation	—	115,240
Miscellaneous	ACG Capital Group Corp.	—	77,920

Source: Aerospace Industries Association, 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.

EXPORT-IMPORT BANK
AUTHORIZATIONS OF LOANS AND GUARANTEES
IN SUPPORT OF EXPORTS OF COMMERCIAL JET AIRCRAFT
Fiscal Year 2006
(Values in Thousands of Dollars)

Customer (Country / Airline)	Principal Supplier	Authorizations	
		Loans	Long-Term Guarantees
		—	<u>\$4,454,460</u>
Angola	TAAG-Linhas Aeras de Angola	—	\$338,462
Austria	Austrian Airlines	—	40,949
Brazil	GOL Transportes Aereos	—	144,155
Canada	WestJet Airlines	—	191,144
Chile	Lan Airlines, Lan Cargo	—	216,629
Chile	Lan Airlines	—	69,906
Germany	Bavaria	—	74,160
India	Jet Airways Ltd.	—	158,903
India	Air India Ltd.	—	900,354
India	Air India Charter Ltd.	—	367,350
Ireland	Ryanair Ltd.	—	166,473
Korea	Asiana Airlines	—	257,407
Mexico	Consorcio Aviaxsa	—	15,643
Mexico	Aerovías de Mexico	—	170,706
Morocco	Royal Air Maroc	—	72,608
Morocco	Royal Air Maroc	—	80,196
Netherlands	KLM Royal Dutch Airlines	—	95,792
Netherlands	KLM Royal Dutch Airlines	—	95,451
New Zealand	Air New Zealand	—	125,918
Panama	Compania Panemana de Aviación	—	66,197
Singapore	Singapore Airlines Cargo	—	146,712
Thailand	Thai Airways International	—	484,245
Turkey	Turk Hava Yollari Tao	—	175,100

Source: Aerospace Industries Association, 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.

U.S. EXPORTS OF MILITARY PRODUCTS

Calendar Years 2006 and 2007
(Millions of Dollars)

Country of Destination	2006			2007		
	Aerospace	Other ^a	Total	Aerospace	Other ^a	Total
World Total	\$13,405	\$3,337	\$16,742	\$13,247	\$3,469	\$16,716
South Korea	\$2,270	\$249	\$2,519	\$1,900	\$164	\$2,064
Japan	1,270	427	1,697	1,369	298	1,667
Israel	1,227	343	1,570	915	393	1,307
Poland	528	39	567	1,158	162	1,320
United Kingdom	622	368	990	851	439	1,290
Canada	90	212	302	606	288	894
Greece	219	89	308	736	33	769
Australia	684	205	889	397	248	645
Egypt	154	350	505	149	398	548
Germany	397	125	522	414	108	521
Turkey	383	80	463	377	37	414
Singapore	717	6	723	367	17	384
Iraq	176	26	202	329	28	358
Taiwan	200	189	388	165	147	312
United Arab Emirates	1,085	83	1,168	297	20	316
Netherlands	140	79	219	260	33	293
Kuwait	249	62	311	219	31	250
Pakistan	123	62	185	125	64	189
Qatar	132	3	135	176	17	193
Saudi Arabia	98	23	121	124	60	183
Spain	163	22	185	149	36	185
Italy	271	8	279	163	14	176
Switzerland	47	4	51	133	23	156
Denmark	36	16	52	137	16	152
Chile	363	13	376	114	31	145

Source: Aerospace Industries Association, based on data from the U.S. Census Bureau.

a. Includes tank & other armored fight vehicles, military weapons, bombs, grenades, etc., and vessels.

U.S. EXPORTS OF MILITARY AEROSPACE PRODUCTS

Calendar Years 2003 – 2007
(Millions of Dollars)

Country of Destination	2003	2004	2005	2006	2007
World Total	\$8,138	\$9,045	\$9,845	\$13,405	\$13,247
South Korea	\$667	\$603	\$1,054	\$2,270	\$1,900
Japan	1,244	1,168	1,191	1,270	1,369
Poland	3	2	11	528	1,158
Israel	513	951	1,091	1,227	915
United Kingdom	572	585	538	622	851
Greece	1,536	953	142	219	736
Canada	134	153	192	90	606
Germany	225	347	404	397	414
Australia	237	297	329	684	397
Turkey	225	166	197	383	377
Singapore	311	711	497	717	367
Iraq	5	29	111	176	329
United Arab Emirates	48	68	1,220	1,085	297
Netherlands	146	152	141	140	260
Kuwait	39	31	39	249	219
Qatar	33	19	97	132	176
Taiwan	193	240	387	200	165
Italy	172	577	331	271	163
Egypt	240	215	190	154	149
Spain	103	99	104	163	149
Denmark	19	291	20	36	137
Switzerland	19	33	56	47	133
Pakistan	14	126	74	123	125
Saudi Arabia	154	141	117	98	124
Chile	4	14	15	363	114

Source: Aerospace Industries Association, based on data from the U.S. Census Bureau.

EXPORTS OF AEROSPACE PRODUCTS AND PARTS TOP 25 STATES

(Value in Thousands of Dollars)

State	2005	2006	2007	Percent Change 2006-2007	Compound Annual Growth Rate 2003-2007
All States	\$67,088,532	\$84,630,418	\$96,365,247	13.9%	16.2%
Washington	19,975,606	32,983,803	41,915,925	27.1	18.4
California	9,070,443	8,551,935	6,912,100	(19.2)	5.8
Connecticut	3,825,278	5,177,091	5,570,492	7.6	15.2
Texas	4,398,109	5,570,229	5,143,147	(7.7)	27.4
Kentucky	2,781,751	3,059,457	3,795,771	24.1	19.0
Ohio	2,585,579	2,333,875	3,358,756	43.9	15.8
Kansas	1,969,175	2,739,359	3,285,520	19.9	32.6
Florida	2,736,169	3,487,677	3,167,678	(9.2)	9.5
Georgia	2,819,546	2,223,053	2,913,909	31.1	29.0
Arizona	2,153,435	2,397,909	2,652,924	10.6	8.3
New York	3,256,404	2,682,558	2,514,073	(6.3)	0.7
Missouri	636,926	1,766,201	1,305,058	(26.1)	69.1
Illinois	630,891	861,380	1,266,908	47.1	36.4
New Jersey	899,444	885,740	1,213,222	37.0	6.2
Arkansas	832,019	1,030,656	1,148,023	11.4	31.7
Virginia	547,099	769,043	967,988	25.9	17.9
Tennessee	738,735	856,802	905,002	5.6	12.2
North Carolina	472,959	642,340	815,592	27.0	18.0
Indiana	643,808	633,108	800,606	26.5	12.9
Maryland	570,955	653,409	713,884	9.3	17.1
Massachusetts	289,764	328,289	610,520	86.0	23.7
District of Columbia	417,841	493,928	575,165	16.4	15.6
Pennsylvania	659,811	460,234	548,068	19.1	7.5
Michigan	417,193	442,969	434,010	(2.0)	10.7
Minnesota	220,457	396,641	431,943	8.9	25.1

Source: Aerospace Industries Association, based on data from the U.S. Census Bureau.

Note: Totals may not match totals provided in other AIA reports due to different Census Bureau survey methods.

WORKFORCE



Technician Repairing a Turbofan Engine (Honeywell Photo)

As the overall U.S. manufacturing industry shed 271,000 jobs in 2007, the aerospace industry added to its ranks for the fourth straight year. Average annual aerospace employment reached 645,600, up from a low of 587,100 in 2003, but still off significantly from its

1989 peak of 1.3 million. Aerospace employment's year-over-year improvement was 2.2 percent, above—but in line with—the industry's 0.5 percent compound annual growth rate (CAGR) for 2002-2006.

As might be expected given the employment declines in other sectors, aerospace employment accounted for a larger share of industry totals in 2007. Aerospace represented 4.7 percent of total manufacturing, up from 4.5 percent, and 7.3 percent of overall durable goods manufacturers, up from 7.0 percent.

Within the aerospace industry's labor force, the largest segment was engaged in the manufacture of aircraft, engines, and parts. Of these 411,700 workers, 228,600 produced aircraft, 85,100 produced engines, and 98,000 were accounted for under the *other parts and equipment* category. Missiles and space vehicles manufacturing employed another 75,000, while search, detection, and navigation instruments manufacturing employed 159,000.

On average, the aerospace workforce is highly-skilled, specialized, and productive. Although aerospace workers comprised only 4.7 percent of the total manufacturing workforce, their compensation represented 7.1 percent of the total annual payroll for all manufacturing.

Average weekly hours for aerospace production workers increased for the fourth consecutive year in 2007, to 43.6 hours, the highest level since 1998. Aircraft engines and parts workers continued to have the highest average hours, at 45.1 hours per week.

In recent years, the aerospace industry has improved its workplace safety record. Occupational illness and injury rates were down yet again in 2007, to just 5.6 per 100 full-time workers. While the industry had no work-stoppages in 2007, the 57-day long Boeing shutdown in 2008 will add a significant number of work-days idle to the year's tally.

NASA employment fell slightly in fiscal year (FY) 2007 to 170,212, a drop of less than one percent. Employment has also been flat in recent years, with a 2002-2006 CAGR of less than one percent. NASA's employment is expected to drop again in 2008 as the agency loses an estimated 1,000 contractor employees. As the Space Shuttle nears retirement, the full complement of contractors engaged with the project will no longer be needed. NASA will likely not see workforce growth until the new Orion spacecraft enters production in advance of its first scheduled launch in 2014.



DDX High Frequency Composite Window (Goodrich Photo)

For FY 2008, the Defense Department had its strongest civilian workforce in ten years, as its commitments and responsibilities around the world continued to expand. Of the more than 690,000 civil employees, 97 percent served in a military-related capacity. The Army, Navy, and Air Force employed the bulk of the civilian workforce (approximately 575,000) in FY 2008. Other top military employers of civilian workers included the Defense Logistics Agency and the Defense Commissary Agency.

California, home to the facilities of numerous primes, tier-one contractors, and leading sub-tier suppliers, remained the leading aerospace employer in 2007. Washington, Texas, Kansas, and Arizona rounded out the top-five states having the highest total aerospace employment. These states employed over half of all aerospace workers in the United States. Historically, aerospace employment has clustered around manufacturing supercenters, where suppliers locate in close proximity to their major clients.

The aerospace industry is increasingly concerned with its future workforce. The industry has a rapidly aging workforce: in 2007, 59 percent of

aerospace employees were over the age of 45. Yet a sufficient replacement pool of talent is not in place, given the shortage of qualified younger workers.

Troubling signs for the aerospace workforce include a young population not prepared, or inclined, to pursue science and technical careers. For example, the number of bachelor's degrees awarded in engineering slipped 1.2 percent in 2006-2007, the first drop in seven years. Moreover, enrollment data suggest this trend may continue for several years.

While much work remains to be done on science, technology, engineering and math (STEM) education, degrees in many aerospace-critical disciplines saw notable increases from 1999 to 2007. Bachelor's degrees in aerospace engineering were up 137 percent, while mechanical engineering degrees grew 30 percent. Computer engineering and electrical engineering, two other fields important to the aerospace industry, also registered growth.



B-787 Dreamliner Aft Fuselage (Photo Courtesy of Vought Aircraft Industries)



UH-60L Black Hawk Cabin (Photo Courtesy of Vought Aircraft Industries)

A recent workforce survey by AIA highlighted the importance of STEM education to the aerospace industry, with most member companies supporting STEM programs and encouraging their employees to volunteer or mentor students.

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

Calendar Years 1980 – 2007
(Thousands)

Year	All Mfg. Industries	Durable Goods Industries	Aerospace Industry ^a		
			Total	As Percent of:	
				All Mfg.	Durable Goods
1980	18,733	11,679	1,080	5.8%	9.2%
1981	18,634	11,611	1,087	5.8	9.4
1982	17,363	10,610	1,038	6.0	9.8
1983	17,048	10,326	1,019	6.0	9.9
1984	17,920	11,050	1,058	5.9	9.6
1985	17,819	11,034	1,151	6.5	10.4
1986	17,552	10,795	1,241	7.1	11.5
1987	17,609	10,767	1,282	7.3	11.9
1988	17,906	10,969	1,294	7.2	11.8
1989	17,985	11,004	1,314	7.3	11.9
1990(b)	17,695	10,737	1,121	6.3	10.4
1991	17,068	10,220	1,040	6.1	10.2
1992	16,799	9,946	936	5.6	9.4
1993	16,774	9,901	825	4.9	8.3
1994	17,020	10,132	728	4.3	7.2
1995	17,241	10,373	673	3.9	6.5
1996	17,237	10,486	672	3.9	6.4
1997	17,419	10,705	714	4.1	6.7
1998	17,560	10,911	741	4.2	6.8
1999	17,322	10,831	709	4.1	6.5
2000	17,263	10,877	666	3.9	6.1
2001	16,441	10,336	661	4.0	6.4
2002	15,259	9,485	618	4.1	6.5
2003	14,510	8,964	587	4.0	6.5
2004	14,315	8,925	592	4.1	6.6
2005	14,226	8,956	612	4.3	6.8
2006	14,155	8,981	632	4.5	7.0
2007	13,884	8,816	646	4.7	7.3

Source: Bureau of Labor Statistics and Aerospace Industries Association estimates.

a. See Glossary for detailed explanation of *Aerospace Employment*.

b. BLS discontinued reporting employment-related statistics using the SIC in 2003; the NAICS is now used. Prior years (back to 1990) revised for consistency.

ANNUAL PAYROLL OF ALL MANUFACTURING AND AEROSPACE INDUSTRIES

Calendar Years 1983 – 2007
(Millions of Dollars)

Year	All Manufacturing Industries	Aerospace Industry			Aerospace as Percent of All Manufacturing
		TOTAL	Production Workers	Other Workers	
1983	\$400,700	\$23,437	\$8,646	\$14,790	5.8%
1984	445,400	25,741	9,369	16,372	5.8
1985	468,500	28,964	10,538	18,426	6.2
1986	480,700	31,994	11,825	20,170	6.7
1987	496,900	33,677	12,534	21,143	6.8
1988	529,900	35,262	12,581	22,681	6.7
1989	547,900	36,982	13,327	23,655	6.7
1990	561,300	35,635	14,360	21,276	6.3
1991	562,300	34,643	13,839	20,804	6.2
1992	583,400	33,262	13,053	20,209	5.7
1993	592,300	30,521	11,821	18,700	5.2
1994	620,400	28,471	10,964	17,506	4.6
1995	647,400	26,696	10,267	16,430	4.1
1996	673,600	28,075	11,179	16,896	4.2
1997	717,600	31,687	13,374	18,313	4.4
1998	675,200	33,083	14,084	18,999	4.9
1999	697,100	31,276	12,880	18,396	4.5
2000	749,300	31,490	12,347	19,143	4.2
2001(a)	704,095	40,903	13,641	27,262	5.8
2002	670,677	40,700	12,330	28,370	6.1
2003	663,931	40,528	12,023	28,505	6.1
2004	682,379	42,727	12,490	30,237	6.3
2005	699,396	45,972	14,318	31,654	6.6
2006	725,669	50,389	18,748	31,641	6.9
2007	739,918	52,355	22,939	29,416	7.1

Source: U.S. Department of Labor, Bureau of Labor Statistics; Bureau of Economic Analysis, *Survey of Current Business*; and Aerospace Industries Association estimates.

- a. Due to changes in BLS survey methodology (the North American Industry Classification System (NAICS) replaced the Standard Industrial Classification (SIC)), some aerospace industry employment-related statistics reported prior to 2001 may not be directly comparable to those reported from 2001 onward, although overall trends should be retained.

EMPLOYMENT IN THE AEROSPACE INDUSTRY^a

Calendar Years 1993 – 2007
(Thousands)

Year	TOTAL	Aircraft, Engines, & Parts	Missiles, Space Vehicles, & Parts	Search, Detection, & Navigation Instruments
ALL WORKERS				
1993	825	512	113	201
1994	728	454	98	175
1995	673	425	89	158
1996	672	432	82	158
1997	714	472	83	159
1998	741	495	84	163
1999	709	468	79	161
2000	666	438	78	149
2001	661	435	77	150
2002	618	397	74	148
2003	587	372	70	145
2004	592	370	72	151
2005	612	380	75	157
2006	632	399	76	158
2007	646	412	75	159
PRODUCTION WORKERS				
1993	389	264	32	93
1994	340	232	29	80
1995	313	216	26	70
1996	317	226	24	67
1997	346	261	23	62
1998	361	275	23	63
1999	337	252	22	63
2000	304	227	21	56
2001	297	226	19	53
2002	263	204	16	44
2003	250	189	15	45
2004	244	185	13	46
2005	270	192	21	57
2006	327	214	39	74
2007	359	242	47	70

Source: Bureau of Labor Statistics and Aerospace Industries Association estimates.

Notes: BLS discontinued reporting employment-related statistics using the SIC in 2003; the NAICS is now used. Prior years revised for consistency.

a. Annual average. See Glossary for explanation of *Aerospace Employment*.

EMPLOYMENT IN THE AIRCRAFT, ENGINES, AND PARTS INDUSTRY^a

Calendar Years 1993 – 2007
(Thousands)

Year	TOTAL	Aircraft	Engines & Parts	Other Parts & Equipment
ALL WORKERS				
1993	511.5	306.5	106.2	98.8
1994	454.3	275.3	92.5	86.5
1995	425.1	249.0	90.5	85.6
1996	432.0	249.4	92.1	90.5
1997	471.9	270.8	97.1	104.0
1998	495.0	281.5	100.5	113.0
1999	468.0	263.3	98.5	106.2
2000	438.4	242.7	98.1	97.6
2001	434.5	241.3	95.6	97.6
2002	396.7	220.2	87.9	88.6
2003	371.9	209.1	81.3	81.5
2004	369.9	207.2	79.2	83.5
2005	380.0	211.3	81.9	86.8
2006	398.5	221.7	84.4	92.4
2007	411.7	228.6	85.1	98.0
PRODUCTION WORKERS				
1993	263.8	144.4	60.1	59.3
1994	232.0	127.3	52.6	52.1
1995	216.4	112.2	51.8	52.4
1996	226.4	114.7	54.7	57.0
1997	260.5	132.4	60.1	68.0
1998	274.6	138.9	60.6	75.1
1999	252.1	127.3	55.3	69.5
2000	227.2	110.3	54.1	62.8
2001	225.7	108.5	53.6	63.6
2002	203.7	97.2	49.9	56.6
2003	189.3	92.8	45.4	51.1
2004	185.4	89.4	43.8	52.2
2005	191.9	90.4	45.5	56.0
2006	214.1	99.9	54.1	60.1
2007	241.7	110.4	63.1	68.2

Source: Bureau of Labor Statistics and Aerospace Industries Association estimates.

Notes: BLS discontinued reporting employment-related statistics using the SIC in 2003; the NAICS is now used. Prior years revised for consistency.

a. Annual average. See Glossary for explanation of *Aerospace Employment*.

AVERAGE WEEKLY EARNINGS IN THE AEROSPACE INDUSTRY

**Production Workers Only
Calendar Years 1991 – 2007**

Year	TOTAL ^a Aerospace	Aircraft, Engines, & Parts				Missiles, Space Vehicles, & Parts	Search, Detection, & Navigation Instruments
		TOTAL ^a	Aircraft	Engines & Parts	Other Parts & Equipment		
AVERAGE WEEKLY EARNINGS							
1991	\$632	\$656	\$695	\$673	\$546	\$601	\$574
1992	665	694	738	709	576	622	594
1993	691	722	761	735	615	659	614
1994	728	761	803	775	645	697	641
1995	732	764	812	792	634	716	637
1996	774	808	861	837	675	745	668
1997	818	851	919	863	708	792	687
1998	822	855	932	865	704	794	692
1999	816	849	923	883	686	803	687
2000	855	902	992	924	726	803	681
2001	882	929	1,025	955	744	848	694
2002	901	936	1,025	968	757	906	732
2003	927	963	1,033	1,024	780	941	771
2004	984	1,021	1,117	1,112	780	999	829
2005	1,020	1,075	1,205	1,131	818	1,038	829
2006	1,103	1,154	1,297	1,183	891	1,146	930
2007	1,230	1,226	1,349	1,294	966	1,367	1,150

Source: Bureau of Labor Statistics and Aerospace Industries Association estimates.

Notes: BLS discontinued reporting employment-related statistics using the SIC in 2003; the NAICS is now used.
Prior years revised for consistency.

a. TOTAL columns are employment-based weighted averages.

AVERAGE HOURLY EARNINGS IN THE AEROSPACE INDUSTRY

Production Workers Only
Calendar Years 1991 – 2007

Year	TOTAL ^a Aerospace	Aircraft, Engines, & Parts				Missiles, Space Vehicles, & Parts	Search, Detection, & Navigation Instruments
		TOTAL	Aircraft	Engines & Parts	Other Parts & Equipment		
1991	\$15.06	\$15.64	\$16.77	\$15.83	\$12.83	\$14.24	\$13.72
1992	15.89	16.58	17.76	16.76	13.61	15.32	14.10
1993	16.53	17.28	18.51	17.19	14.36	15.93	14.63
1994	17.20	18.04	19.52	17.82	14.63	16.34	15.06
1995	17.27	18.14	19.96	17.85	14.55	16.43	14.87
1996	17.82	18.68	20.48	18.76	15.00	17.15	15.13
1997	18.25	18.90	20.76	19.12	15.31	18.23	15.31
1998	18.60	19.18	21.09	19.48	15.55	18.71	15.87
1999	19.02	19.64	21.79	20.04	15.61	18.91	16.31
2000	19.81	20.52	23.07	20.76	16.23	19.31	16.69
2001	20.57	21.25	24.06	21.27	16.83	19.92	17.46
2002	21.46	22.08	24.94	21.95	17.68	20.65	18.37
2003	22.27	22.93	25.41	23.50	18.36	21.44	19.29
2004	23.36	23.93	26.87	24.87	18.36	22.90	20.90
2005	23.91	24.82	28.37	25.41	18.82	24.26	20.53
2006	25.43	26.31	29.84	26.23	20.17	26.84	22.39
2007	28.17	28.39	30.51	28.87	22.10	31.91	27.27

Source: Bureau of Labor Statistics and Aerospace Industries Association estimates.

Notes: BLS discontinued reporting employment-related statistics using the SIC in 2003; the NAICS is now used.
 Prior years revised for consistency.

a. Column reports employment-based weighted averages.

AVERAGE HOURS IN THE AEROSPACE INDUSTRY

Production Workers Only
Calendar Years 1993 – 2007

Year	TOTAL ^a Aerospace	Aircraft, Engines, & Parts				Missiles, Space Vehicles, & Parts	Search, Detection, & Navigation Instruments
		TOTAL	Aircraft	Engines & Parts	Other Parts & Equipment		
AVERAGE WEEKLY HOURS							
1993	41.8	41.9	41.1	42.8	42.8	41.2	42.0
1994	42.4	42.3	41.1	43.5	44.1	42.2	42.6
1995	42.4	42.3	40.7	44.4	43.6	42.4	42.8
1996	43.5	43.4	42.0	44.6	45.0	42.5	44.2
1997	44.8	44.8	44.3	45.1	46.3	42.5	44.9
1998	44.2	44.3	44.2	44.4	45.3	41.4	43.6
1999	42.8	43.0	42.4	44.1	43.9	40.8	42.1
2000	43.1	43.6	43.0	44.5	44.7	41.1	40.8
2001	42.7	43.4	42.6	44.9	44.2	41.0	39.7
2002	41.9	42.3	41.1	44.1	42.9	41.8	39.8
2003	41.6	41.9	40.7	43.6	42.5	42.1	40.0
2004	42.1	42.6	41.6	44.7	42.5	42.8	39.7
2005	42.6	43.2	42.5	44.5	43.5	42.6	40.4
2006	43.3	43.8	43.5	45.1	44.2	42.2	41.6
2007	43.6	44.0	44.2	45.1	43.7	42.5	42.1

AVERAGE WEEKLY OVERTIME HOURS

1993	3.9	4.7	4.0	5.0	5.9	3.2	2.0
1994	4.7	5.5	4.6	5.8	7.6	4.2	2.4
1995	5.2	6.0	4.7	6.5	8.2	4.3	3.0
1996	6.3	7.2	6.0	7.1	9.9	4.6	3.6
1997	7.7	8.5	8.0	7.4	11.4	5.7	4.0
1998	6.6	7.3	6.6	6.6	9.8	5.2	3.5
1999	5.1	5.6	4.7	5.9	6.8	6.3	3.0
2000	5.4	5.8	5.1	6.6	6.9	4.1	3.7
2001	5.2	5.6	4.6	6.7	6.9	3.8	3.2
2002	4.7	5.0	4.4	6.0	5.6	3.4	3.2
2003	4.7	5.2	4.8	6.1	5.5	3.9	2.7
2004	5.1	5.5	4.4	6.9	6.2	5.5	3.2
2005	5.2	5.7	4.8	6.7	6.4	5.5	3.3
2006	5.0	5.5	4.8	6.1	6.0	5.7	3.3
2007	4.7	5.1	5.0	5.4	5.9	3.7	3.0

Source: Bureau of Labor Statistics and Aerospace Industries Association estimates.

Notes: BLS discontinued reporting employment-related statistics using the SIC in 2003; the NAICS is now used.

Prior years revised for consistency.

a. Column reports employment-based weighted averages.

EMPLOYER COSTS FOR EMPLOYEE COMPENSATION IN THE AIRCRAFT MANUFACTURING INDUSTRY

As of First-Quarter 2003 – 2008

	2003 ^a	2004 ^a	2005 ^a	2006 ^a	2007 ^b	2008 ^b
ALL OCCUPATIONS						
TOTAL	\$45.85	\$50.70	\$59.79	\$55.36	\$54.60	\$54.57
Wages and Salaries	28.71	29.65	30.77	32.07	33.18	33.68
Benefits:	17.14	21.05	29.02	23.29	21.42	20.89
Paid Leave	4.02	4.28	4.41	4.79	5.01	5.07
Supplemental Pay	2.81	1.89	2.34	3.16	4.42	3.80
Insurance	4.18	4.50	4.39	4.64	4.82	4.90
Retirement & Savings	2.40	6.43	13.84	6.96	3.38	3.33
Legally Required	3.50	3.66	3.74	3.75	3.78	3.79
Other	0.23	0.29	0.30	NA	NA	NA
WHITE-COLLAR OCCUPATIONS						
TOTAL	\$49.04	NA	NA	NA	NA	NA
Wages and Salaries	31.59					
Benefits:	17.45					
Paid Leave	4.60					
Supplemental Pay	2.24					
Insurance	4.19					
Retirement & Savings	2.55					
Legally Required	3.63					
Other	0.24					
BLUE-COLLAR OCCUPATIONS						
TOTAL	\$40.77	NA	NA	NA	NA	NA
Wages and Salaries	24.11					
Benefits:	16.67					
Paid Leave	3.08					
Supplemental Pay	3.77					
Insurance	4.14					
Retirement & Savings	2.13					
Legally Required	3.32					
Other	0.22					

Source: U.S. Department of Labor, Bureau of Labor Statistics (BLS), *Employer Cost for Employee Compensation*.

Notes: White-collar and Blue-collar detail not available since BLS converted from SIC to NAICS.

Totals may not equal sum of terms due to rounding.

a. Unpublished estimates from the BLS.

b. New employer cost series for private industry workers in the aircraft manufacturing industry were introduced with the release of BLS's December 2006 estimates.

NA. Not available.

WORK STOPPAGES IN THE AEROSPACE INDUSTRY

Calendar Years 1982 – 2007

Year	Number of Strikes^a	Number of Workers Involved	Work-Days Idle in Year
1982(b)	4	11,900	45,200
1983	2	8,700	404,100
1984	4	14,600	188,200
1985	4	19,700	289,800
1986	-	-	-
1987	-	-	-
1988	3	10,600	415,800
1989	2	58,500	1,848,000
1990	1	2,300	56,700
1991	1	1,500	-
1992	1	3,800	11,400
1993	2	27,800	34,600
1994	-	-	-
1995	1	33,000	1,551,000
1996	2	7,800	90,100
1997	-	-	-
1998	-	-	-
1999	-	-	-
2000	3	22,400	566,400
2001	1	5,000	45,000
2002	3	7,500	118,100
2003	1	4,000	40,000
2004	-	-	-
2005	3	22,800	441,300
2006	3	6,600	194,800
2007	-	-	-

Source: Bureau of Labor Statistics, *Compensation and Working Conditions*.

a. Strikes beginning during calendar year.

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

OCCUPATIONAL INJURY AND ILLNESS INCIDENCE RATES^a ALL MANUFACTURING AND AEROSPACE INDUSTRIES

Calendar Years 2004 – 2007

MANUFACTURING SECTOR	2004	2005	2006	2007
<i>All Manufacturing:</i>				
Total Cases	6.6	6.3	6.0	5.6
Lost Workday Cases	1.6	1.5	1.4	1.3
Non-Fatal Cases Without Lost Workdays	3.0	2.8	2.7	2.5
<i>Total Aerospace:</i>				
Total Cases	4.1	4.3	4.2	3.9
Lost Workday Cases	0.9	1.0	0.9	0.9
Non-Fatal Cases Without Lost Workdays	2.0	1.9	2.0	1.8
<i>Aircraft Manufacturing:</i>				
Total Cases	4.8	4.4	4.4	4.1
Lost Workday Cases	1.0	1.0	1.0	1.0
Non-Fatal Cases Without Lost Workdays	2.1	1.8	1.9	1.7
<i>Aircraft Engine and Engine Parts Manufacturing:</i>				
Total Cases	2.7	NA	3.7	3.6
Lost Workday Cases	0.5	NA	0.9	0.9
Non-Fatal Cases Without Lost Workdays	1.5	NA	2.0	1.8
<i>Other Aircraft Parts and Auxiliary Equipment Manufacturing:</i>				
Total Cases	5.9	5.7	6.3	5.3
Lost Workday Cases	1.3	1.2	1.2	1.1
Non-Fatal Cases Without Lost Workdays	3.2	3.0	3.3	2.6
<i>Guided Missile and Space Vehicle Manufacturing:</i>				
Total Cases	1.2	1.3	1.2	1.3
Lost Workday Cases	0.2	0.3	0.3	0.3
Non-Fatal Cases Without Lost Workdays	0.6	0.6	0.6	0.6
<i>Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing:</i>				
Total Cases	1.7	2.3	2.0	2.1
Lost Workday Cases	0.4	0.3	0.5	0.5
Non-Fatal Cases Without Lost Workdays	0.8	1.2	0.9	0.9

Source: Bureau of Labor Statistics, *Survey of Occupational Injuries and Illnesses*.

a. Defined as the number of injuries and illness cases per 100 full-time workers.

NA. Not available.

EMPLOYMENT IN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) PROGRAMS

End of Fiscal Years 1980 – 2009

Year	TOTAL	NASA Employees	Contractor Employees ^a
1980	135,613	22,613	113,000
1981	133,473	21,873	111,600
1982	128,730	22,430	106,300
1983	129,246	22,246	107,000
1984	162,080	22,080	140,000
1985	131,991	21,991	110,000
1986	154,660	21,660	133,000
1987	165,001	22,001	143,000
1988	172,326	22,326	150,000
1989	213,054	23,054	190,000
1990	221,829	23,829	198,000
1991	223,149	24,149	199,000
1992	230,513	24,513	206,000
1993	229,174	24,174	205,000
1994	217,873	23,873	194,000
1995	209,355	22,355	187,000
1996	198,113	21,113	177,000
1997	189,070	20,070	169,000
1998	183,109	19,109	164,000
1999	181,469	18,469	163,000
2000	173,375	18,375	155,000
2001	171,678	18,678	153,000
2002	177,596	18,596	159,000
2003	172,709	18,709	154,000
2004	170,821	18,821	152,000
2005	180,807	18,807	162,000
2006	170,280	18,280	152,000
2007	170,212	18,212	152,000
2008(E)	169,113	18,113	151,000
2009(E)	169,113	18,113	151,000

Source: Office of Management and Budget, *Budget of the United States Government*, NASA Headquarters, and AIA estimates.

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

E. Estimate.

FEDERAL CIVILIAN EMPLOYMENT IN THE DEPARTMENT OF DEFENSE**Fiscal Years 1979 – 2008**

Year	Total	Civil Functions	Military Functions
1979	960,286	28,592	931,694
1980	960,116	27,700	932,416
1981	984,183	34,400	949,783
1982	989,633	31,111	958,522
1983	1,026,461	30,816	995,645
1984	1,043,747	28,681	1,015,066
1985	1,084,549	28,754	1,055,795
1986	1,067,974	28,511	1,039,463
1987	1,090,018	28,352	1,061,666
1988	1,049,619	28,419	1,021,200
1989	1,075,437	28,081	1,047,356
1990	1,034,152	27,651	1,006,501
1991	1,012,716	27,385	985,331
1992	982,774	27,584	955,190
1993	921,179	27,055	894,124
1994	879,878	28,001	851,877
1995	831,806	27,790	804,016
1996	795,813	27,823	767,990
1997	749,461	26,429	723,032
1998	717,901	25,349	692,552
1999	690,706	25,027	665,679
2000	676,268	25,021	651,247
2001	671,591	24,543	647,048
2002	670,166	25,349	644,817
2003	664,524	25,653	638,871
2004	668,287	24,036	644,251
2005	671,364	22,774	648,590
2006	675,744	23,028	652,716
2007	673,319	21,957	651,362
2008	694,149	22,233	671,916

Source: Office of the Assistant Secretary of Defense - Public Affairs, DoD Personnel and Procurement Statistics.

AEROSPACE INDUSTRY EMPLOYMENT FOR TOP 25 STATES

State	2005	2006	2007	Percent Change 2006-2007
U.S. TOTAL	611,700	631,800	645,600	2.2%
California	121,455	121,357	118,532	(2.3)
Washington	67,602	75,077	81,932	9.1
Texas	54,612	55,815	55,069	(1.3)
Kansas	37,309	39,119	42,122	7.7
Arizona	35,909	36,185	35,837	(1.0)
Connecticut	31,402	32,134	32,767	2.0
Florida	27,474	27,979	29,021	3.7
Georgia	18,664	18,972	19,315	1.8
New York	17,995	18,637	19,043	2.2
Massachusetts	16,646	17,187	17,457	1.6
Ohio	15,645	16,594	17,456	5.2
Missouri	15,566	15,461	14,922	(3.5)
Alabama	12,268	12,852	13,723	6.8
Colorado	11,175	10,882	10,815	(0.6)
Pennsylvania	9,799	10,176	10,297	1.2
New Jersey	10,187	10,382	10,194	(1.8)
Indiana	8,916	8,841	8,843	0.0
Utah	7,170	7,762	8,359	7.7
Oklahoma	4,181	5,061	5,732	13.3
Michigan	5,253	5,535	5,713	3.2
Illinois	4,715	5,007	5,282	5.5
Maryland	4,514	4,555	4,938	8.4
North Carolina	3,180	3,682	4,301	16.8
Arkansas	3,540	3,725	3,993	7.2
Oregon	3,089	3,573	3,704	3.7

Source: Aerospace Industries Association, based on data from the Bureau of Labor Statistics.

AEROSPACE MANUFACTURING EMPLOYMENT BY AGE GROUP

(Thousands)

Calendar Year 2007

Age	Aircraft & Parts	Aerospace Products & Parts	Total	Percent of Total
16-19	2	1	3	0.4%
20-24	13	12	25	3.6
25-34	67	42	109	15.7
35-44	91	61	152	21.9
45-54	126	128	254	36.7
55-64	72	68	140	20.2
65+	5	8	13	1.9
Total 16+	375	318	693	100.0
<i>Median Age</i>	<i>46.1</i>	<i>48.0</i>		

Calendar Year 2006

Age	Aircraft & Parts	Aerospace Products & Parts	Total	Percent of Total
16-19	2	3	5	0.8%
20-24	17	6	23	3.7
25-34	57	40	97	15.5
35-44	73	63	136	21.8
45-54	130	99	229	36.6
55-64	74	49	123	19.7
65+	5	8	13	2.1
Total 16+	358	267	625	100.0
<i>Median Age</i>	<i>46.1</i>	<i>48.0</i>		

Source: Bureau of Labor Statistics, Current Population Survey.

Note: This page uses employment data from a different BLS survey than is used elsewhere in *Aerospace Facts & Figures*.

DEGREES AWARDED IN SELECTED ENGINEERING DISCIPLINES

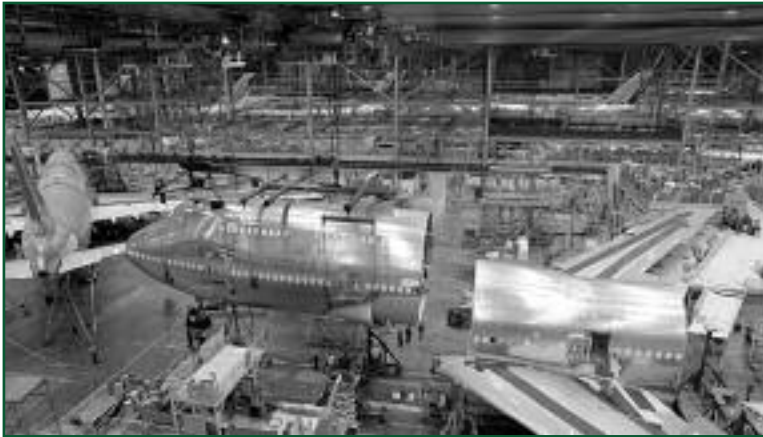
	2006	2007	Percent Change 2006-2007	Percent Change 2003-2007	Percent Change 1999-2007
Bachelors:					
Aerospace	2,722	2,788	2.4%	38.6%	137.5%
Computer	4,901	4,046	(17.4)	(29.6)	29.8
Electrical	11,915	11,467	(3.8)	(4.4)	4.7
Mechanical	16,063	16,701	4.0	21.0	29.9
Masters:					
Aerospace	1,094	1,056	(3.5)	46.7	64.7
Computer	1,510	1,479	(2.1)	(17.8)	25.7
Electrical	3,753	3,532	(5.9)	(3.3)	10.8
Mechanical	4,631	4,485	(3.2)	21.9	35.6
Doctoral:					
Aerospace	244	259	6.1	31.5	24.5
Computer	191	193	1.0	103.2	121.8
Electrical	939	1,064	13.3	65.2	63.4
Mechanical	1,132	1,131	(0.1)	42.8	34.3

Source: American Society for Engineering Education, *Engineering By The Numbers*.

FINANCE

Overall, the industry's financial statements indicated that aerospace companies continued to gain more solid footing in 2007. In recent years, liquidity, low-debt, and strong cash flow became top priorities industry-wide. Such fiscal prudence is now paying off, putting aerospace companies in a much stronger position to endure the challenging economic environment expected.

The aerospace industry continued to strengthen its financial base in 2007, generating \$18.7 billion in net income. Expressed as a percentage of sales, profit amounted to 8.2 percent, up from last year's 6.7 percent. The aerospace profit-to-sales ratio surpassed the average for all U.S. manufacturing corporations for the first time since 2002, despite the fact that U.S. manufacturing in general had an expansive year. The all-industry average was 7.3 percent. The average for non-durable goods topped them both, reaching 9.2 percent in 2007.



B-747 on Factory Floor (Boeing Photo)

Aerospace ratios relating to assets and equity were equally impressive in 2007. As a percentage of assets, the aerospace profit was 6.7 percent, on-par with the ratio for all-manufacturing. This is worth noting, as aerospace has trailed in this metric since 2003. As a percentage of equity, the aerospace profit came to 24.5 percent, with the all-manufacturing profit at 15.1 percent.



P-40, F-16, F-15E, F-22 (U.S. Air Force Photo)

The aerospace industry's balance sheet, as reported by the Bureau of the Census, recorded an increase in net working capital from \$12.8 billion in 2006, to \$20.9 billion in 2007, a 64 percent increase. Total assets came to \$297 billion, up from \$263 billion in the previous year. Receivables continued to climb in 2007, reaching \$67.2 billion. Capital expenditures for aircraft rose again in 2006 (the latest year for which data are available), but were down for missiles, bringing overall aerospace companies' capital expenditures slightly down.

The Defense Department awarded over \$248 billion in contracts during fiscal 2007. Lockheed Martin once again topped the list of Defense Department contractors, with contracts totaling \$28 billion. Boeing, Northrop Grumman, General Dynamics and Raytheon rounded out the top five contractors, which together accounted for more than a third of the Defense Department's awards.

NASA procurement dropped \$1.4 billion in 2007 to \$14.4 billion, as educational and nonprofit contractors were awarded fewer contracts. The United Space Alliance (Lockheed Martin and Boeing) was again NASA's leading contractor with awards remaining level at \$1.8 billion. The United Space Alliance is involved in major NASA endeavors including the Space Shuttle, International Space Station, and Constellation programs. The other top-five contractors in fiscal 2007 were Lockheed Martin, Jacobs Technology, ATK Thiokol, and Boeing.

The aerospace industry is entering the current economic downturn on solid financial ground. However, the industry's future financial wellbeing faces a number of threats. Worsening economic conditions may exclude potential aerospace customers that are unable to access affordable capital.

Also, there is worry that as government intervention widens, additional funds will be required to pay for the rescue packages. Further, increased spending on civilian goods, which is likely under the new Administration, will put downward pressure on defense spending.



F-22 Raptor (Lockheed Martin Photo)

INCOME STATEMENT AND OPERATING RATIOS FOR AEROSPACE COMPANIES^a

Calendar Years 2004 – 2007
(Millions of Dollars)

INCOME STATEMENT	2004	2005	2006	2007
Net Sales, Receipts, Operating Revenues	\$184,418	\$197,234	\$210,171	\$229,622
Less: Depreciation, Depletion, & Amortization of Property, Plant, and Equipment	4,092	4,008	4,286	4,332
Less: All Other Operating Costs & Expenses, including Selling Costs & General & Administrative Expenses	167,679	178,953	188,726	201,867
Income (or Loss) from Operations	\$12,647	\$14,273	\$17,157	\$23,423
Net Non-Operating Income (Expense)	(1,089)	1,387	1,340	1,518
Income (or Loss) before Income Taxes (= Total Income)	\$11,558	\$15,660	\$18,497	\$24,942
Less: Provision for Current & Deferred Domestic Income Taxes	2,053	3,088	4,391	6,225
Income (or Loss) after Income Taxes (= Net Profit)	\$9,504	\$12,572	\$14,106	\$18,715
Cash Dividends Charged to Retained Earnings	3,509	3,824	4,525	4,835
Net Income Retained in Business	\$5,995	\$8,747	\$9,581	\$13,882
Retained Earnings at Beginning of Year(b)	53,419	57,287	62,729	74,094
Adjustments to Retained Earnings(c)	(623)	(643)	(793)	(5,435)
Retained Earnings at End of Year(d)	\$58,791	\$65,392	\$71,517	\$82,539
OPERATING RATIOS				
Income before Taxes as Percent of Net Sales	6.3%	7.9%	8.8%	10.9%
Provision for Current & Deferred Domestic Income Taxes as Percent of Income before Taxes (Total Income)	17.8	19.7	23.7	25.0
Income after Taxes (Net Profit) as Percent of Net Sales	5.2	6.4	6.7	8.2
Income after Taxes (Net Profit) as Percent of Stockholders' Equity(f)	13.6	16.4	20.4	22.0
Income after Taxes (Net Profit) as Percent of Total Assets(f)	3.9	4.6	5.4	6.3

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

a. Based on sample of corporate entities classified in NAICS code 3364, having as their principal activity the manufacture of aerospace products 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.

f. Average of four quarters.

BALANCE SHEET FOR AEROSPACE COMPANIES^a

As of End-of-Year, 2004 – 2007
(Millions of Dollars)

	2004	2005	2006	2007
ASSETS:				
Current Assets:				
Cash	\$7,797	\$11,121	\$10,319	\$13,401
Securities, Commercial Paper, & Other				
Short-term Financial Investments	2,444	2,562	2,074	2,904
Total Cash and US Government				
and Other Securities	\$10,241	\$13,684	\$12,393	\$16,305
Receivables (Total)	47,945	55,734	57,895	67,191
Inventories (Gross)	37,389	45,960	44,587	52,129
Other Current Assets	15,385	19,578	20,032	21,533
Current Assets—TOTAL	\$110,960	\$134,954	\$134,906	\$157,158
Net Plant, Property, & Equipment	27,667	28,838	27,800	29,103
Other Non-Current Assets	103,887	109,336	99,842	110,459
Assets—TOTAL	\$242,515	\$273,129	\$262,549	\$296,720
LIABILITIES:				
Current Liabilities:				
Short Term Loans	\$2,394	\$3,618	\$2,156	\$3,154
Trade Accounts & Notes Payable	13,607	15,703	16,332	17,306
Income Taxes Accrued	1,661	2,476	2,105	264
Installments Due on Long Term Debts	2,245	3,870	1,289	2,129
Other Current Liabilities	80,683	97,450	100,266	113,418
Current Liabilities—TOTAL	\$100,592	\$123,117	\$122,147	\$136,270
Long Term Debt	31,747	30,714	32,525	35,887
Other Non-Current Liabilities	40,162	42,786	38,835	39,388
Liabilities—TOTAL	\$172,500	\$196,617	\$193,508	\$211,546
Stockholders' Equity:				
Capital Stock	\$11,070	\$13,259	(\$2,040)	\$814
Retained Earnings	58,945	63,253	71,081	84,361
Stockholders' Equity—TOTAL	\$70,014	\$76,512	\$69,041	\$85,175
Liabilities & Stockholders' Equity				
TOTAL	\$242,515	\$273,129	\$262,549	\$296,720
Net Working Capital	\$10,369	\$11,837	\$12,759	\$20,888

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

a. Based on a sample of corporate entities classified in NAICS code 3364, having as their principal activity the manufacture of aerospace products and parts.

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

Calendar Years 1994 – 2007

Year	Percent of Sales			
	All Manufacturing	Non-Durable Goods	Durable Goods	Aerospace ^a Industry
1994	5.4%	5.5%	5.2%	4.7%
1995	5.7	6.1	5.3	3.8
1996	6.0	6.6	5.5	5.6
1997	6.2	6.6	5.8	5.2
1998	6.0	6.1	5.9	5.0
1999	6.2	6.2	6.2	6.5
2000	6.1	6.9	5.4	4.7
2001	0.8	5.7	(3.3)	3.9
2002	3.3	6.0	1.1	4.1
2003	5.4	7.1	3.9	4.2
2004	7.1	8.0	6.2	5.2
2005	7.4	9.0	5.9	6.4
2006	8.1	9.7	6.6	6.7
2007	7.3	9.2	5.3	8.2

Year	Percent of Assets ^b		Percent of Equity ^b	
	All Manufacturing	Aerospace ^a Industry	All Manufacturing	Aerospace ^a Industry
1994	5.8%	4.3%	15.6%	14.8%
1995	6.2	3.5	16.2	11.1
1996	6.5	5.1	16.8	17.1
1997	6.6	4.8	16.6	17.3
1998	6.1	4.8	15.7	18.0
1999	6.1	6.2	16.5	21.8
2000	5.9	4.3	15.2	14.2
2001	0.8	3.6	1.9	11.6
2002	2.9	3.7	7.7	11.7
2003	4.7	3.3	12.2	12.3
2004	6.5	4.0	15.9	14.3
2005	6.9	4.7	16.4	16.8
2006	7.6	5.1	17.5	18.4
2007	6.7	6.7	15.1	24.5

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

a. Based on a sample of corporate entities classified in NAICS code 3364, having as their principal activity the manufacture of aerospace products and parts. Prior to 2001, data categorized using the SIC system and reported combining codes 372 and 376.

b. Average of four quarters.

() Net loss after taxes.

CAPITAL EXPENDITURES

Calendar Years 1977 – 2006
(Millions of Dollars)

Year	All Manufacturing Industries	Aerospace^a	Aircraft	Missiles
1977	\$47,459	\$673	\$508	\$164
1978	55,209	948	775	174
1979	61,533	1,551	1,301	250
1980	70,113	1,923	1,618	306
1981	78,632	2,006	1,637	369
1982	74,562	2,142	1,680	462
1983	61,931	2,159	1,530	629
1984	75,186	3,050	2,091	960
1985	83,058	3,784	2,429	1,356
1986	76,355	4,145	2,818	1,327
1987	78,650	3,612	2,536	1,075
1988	81,593	3,388	2,362	1,026
1989	98,738	3,921	2,800	1,121
1990	105,018	3,490	2,621	869
1991	103,003	3,407	2,823	584
1992	103,188	3,860	3,384	476
1993	103,133	2,725	2,307	418
1994	112,784	2,363	1,969	395
1995	128,473	2,114	1,734	380
1996	139,323	2,513	2,023	490
1997(b)	151,511	3,132	2,380	752
1998	152,708	3,477	2,613	864
1999	150,325	3,422	2,338	1,084
2000	154,479	2,326	1,894	432
2001	143,083	2,449	2,059	390
2002	123,067	2,842	2,354	488
2003	112,176	2,389	1,859	530
2004	113,793	2,164	1,784	380
2005	128,292	2,987	2,252	735
2006	135,889	2,909	2,444	465

Source: Bureau of the Census, *Annual Survey of Manufactures*.

a. Combined total for establishments in Aircraft, Missiles, Space Vehicles, and Parts Manufacturing.

b. Prior to 1997, figures included only new capital expenditures.

KEY OPERATING COSTS FOR SELECTED AEROSPACE MANUFACTURING CENTERS

As of 2008

State	Location	Total Annual Operating Cost^a (in millions)	Hourly Labor Cost	Power (¢/kwh)	Land Cost per Acre (in thousands)
CA	San Jose/Sunnyvale	\$45.29	\$26.34	11.08	\$1,175.05
CA	Los Angeles/Torrance	43.07	24.99	11.33	1,115.00
MA	Boston/Lexington	41.15	24.74	16.40	162.50
WA	Seattle/Everett/Renton	40.25	24.38	6.79	436.00
CT	East Hartford/Middletown/ Cheshire	40.21	24.28	17.23	150.00
CA	Riverside/San Bernardino	39.10	23.87	11.33	342.20
MD	Bethesda/Rockville/ Gaithersburg	38.93	23.50	9.01	420.00
MA	Worcester/Marlborough	38.70	23.10	16.39	118.00
PA	Philadelphia/King of Prussia	38.69	23.54	7.50	275.00
IL	Chicago	38.63	23.89	10.82	205.00
MN	Minneapolis/St. Paul	37.82	23.65	5.84	165.00
NY	Rochester	37.22	22.95	8.38	58.00
AZ	Phoenix/Mesa	37.07	22.10	5.44	515.00
NH	Manchester/Nashua	36.64	22.55	10.75	110.00
CO	Denver/Boulder	36.58	23.16	5.27	152.00
TX	Houston	36.38	22.95	10.06	165.00
OH	Cleveland	36.10	22.42	7.61	110.00
MO	St. Louis	35.79	22.51	4.07	207.50
TX	Dallas/Ft. Worth/Irving	35.61	22.59	8.53	155.00
OH	Cincinnati	35.08	22.01	6.63	75.00
NC	Charlotte	34.45	22.10	4.26	105.00
OK	Tulsa	33.73	21.31	5.40	93.00
IA	Cedar Rapids	33.69	21.71	4.68	87.50
GA	Savannah	33.53	21.14	6.69	60.00
FL	Pensacola	33.19	20.73	6.98	65.00
SC	Greenville/Spartanburg	32.75	21.09	4.01	51.00

(Continued on next page)

KEY OPERATING COSTS FOR SELECTED AEROSPACE MANUFACTURING CENTERS

As of 2008, continued

Construction (\$/sq ft)	Property Tax (per \$1,000)	Sales Tax (state and local)	Location
\$96.65	\$11.00	\$8.25	San Jose/Sunnyvale
90.12	11.50	8.25	Los Angeles/Torrance
92.94	32.68	5.00	Boston/Lexington
83.01	12.10	8.80	Seattle/Everett/Renton
85.67	37.69	6.00	East Hartford/Middletown/ Cheshire
86.49	10.90	7.75	Riverside/San Bernardino
90.38	24.00	5.00	Bethesda/Rockville/ Gaithersburg
85.72	26.92	5.00	Worcester/Marlborough
88.61	25.40	7.00	Philadelphia/King of Prussia
90.23	23.85	8.05	Chicago
84.42	40.39	7.00	Minneapolis/St. Paul
86.64	31.10	8.05	Rochester
69.27	23.80	8.10	Phoenix/Mesa
75.80	35.30	0.00	Manchester/Nashua
76.70	32.26	8.10	Denver/Boulder
68.40	22.50	8.25	Houston
81.24	21.54	8.00	Cleveland
82.11	17.00	7.62	St. Louis
66.64	24.60	8.25	Dallas/Ft. Worth/Irving
76.25	23.41	7.00	Cincinnati
57.87	12.40	7.50	Charlotte
62.51	14.60	8.52	Tulsa
72.78	17.60	5.00	Cedar Rapids
59.96	20.30	6.00	Savannah
58.15	16.90	7.50	Pensacola
57.41	19.65	5.00	Greenville/Spartanburg

Source: The Boyd Company (Princeton, NJ), *BizCosts.com* 2008 Comparative Aerospace Industry Manufacturing Costs.

- a. Based on a representative 450-worker aerospace manufacturing plant occupying 275,000 sq. ft. on a 30-acre industrially zoned site.

DEPARTMENT OF DEFENSE MAJOR CONTRACTORS

Fiscal Years 2003 – 2007
(Millions of Dollars)

	2003	2004	2005	2006	2007
TOTAL CONTRACT AWARDS	\$153,907	\$183,756	\$210,434	\$235,106	\$248,642
Lockheed Martin Corp.	\$19,788	\$20,577	\$18,798	\$26,992	\$27,934
The Boeing Co.	14,962	17,152	17,639	19,891	22,623
Northrup Grumman Corp.	10,086	11,539	12,559	15,727	17,023
General Dynamics Corp.	9,016	11,074	12,954	12,122	14,036
Raytheon Co.	6,433	8,371	8,648	9,788	11,287
BAE Systems PLC	3,438	4,139	6,655	5,950	9,039
L-3 Communications Holding, Inc.	3,079	3,997	4,458	4,996	6,059
United Technologies Inc.	3,914	5,138	4,918	4,600	5,311
KBR, Inc.	2,203	7,638	5,659	5,979	4,809
Science Applications Int'l Corp.	2,474	2,601	2,912	3,195	3,586
MacAndrews & Forbes Holdings	561	1,108	1,408	2,138	3,361
General Electric Co.	2,532	1,987	2,510	2,461	2,520
Computer Sciences Corp.	81	1,692	2,066	2,088	2,414
Textron, Inc.	733	958	1,807	1,142	2,375
Oshkosh Corp.	647	1,031	1,507	988	2,344
ITT Industries Inc.	1,018	1,460	2,307	2,312	2,148
Royal Dutch Shell	92	163	351	358	2,118
URS Corp.	1,049	1,406	2,238	1,880	2,000
Electronic Data Systems Corp.	642	1,740	1,292	1,979	1,935
Bell Boeing Joint Project office	853	1,540	1,065	1,111	1,905
Agility			124	1,536	1,825
DRS Technologies, Inc.	835	1,206	1,388	1,357	1,801
Honeywell International, Inc.	1,154	1,755	1,518	1,643	1,647
Booz Allen Hamilton Inc.	761	908	1,178	1,223	1,545
Harris Corp.	473	600	749	1,411	1,509
AmericasourceBergen Corp.	(a)	(a)	622	1,322	1,453
FedEx Corp.	1,043	938	1,344	1,293	1,346
CACI International Inc.	454	634	809	876	1,190
Rockwell Collins, Inc.	738	866	871	984	1,177
Navistar Defense, LLC.	(a)	(a)	108	122	1,167

Source: Department of Defense, *100 Companies Receiving the Largest Dollar Volume of Prime Contract Awards*.

Note: Listed by rank according to net value of prime contracts awarded during last fiscal year.

a. Not in top 100 companies for indicated year(s).

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MAJOR CONTRACTORS

Fiscal Years 2004 – 2007
(Millions of Dollars)

	2004	2005	2006	2007
TOTAL PROCUREMENTS	\$13,472	\$15,342	\$15,846	\$14,363
Awards to Business Firms^a	9,026	10,358	11,467	10,549
% of TOTAL PROCUREMENTS	67%	68%	72%	73%
United Space Alliance LLC	\$1,779	\$2,042	\$1,822	\$1,823
Lockheed Martin Corp.	596	934	1,708	804
Jacobs Technology Inc.	(b)	(b)	(b)	564
ATK Thiokol Corp.	335	384	460	561
Boeing Co.	667	490	453	516
Pratt & Whitney Rocketdyne Inc.	(b)	(b)	404	372
Science Applications Int'l Corp.	351	426	436	357
Honeywell Technology Solutions	225	284	274	303
Space Gateway Support	266	322	297	278
Northrop Grumman Corp.	91	138	168	249
Delta Launch Services	152	222	232	169
SGT Inc.	35	80	100	150
OAo Corp.	71	76	81	131
Wyle Laboratories	104	101	100	131
Swales & Associates Inc.	124	132	127	118
ITT Industries Space Sys.	30	64	84	117
CSC Applied Technologies	(b)	93	100	116
McDonnell Douglas Corp.	39	16	47	102
ASRC Aerospace Corp.	47	43	68	101
Hamilton Sundstrand Corp.	81	88	92	101
Russian Space Agency	(b)	(b)	80	100
Ball Aerospace & Tech Corp.	74	110	116	100
Lockheed Martin Space Operations	220	131	115	100
Space Exploration Technologies	(b)	(b)	29	96
Indyne Inc.	71	58	90	86
Lockheed Martin Space Sys Co.	33	63	72	78
MEI Technologies Inc.	(b)	(b)	72	70
Teledyne Brown Engineering Inc.	35	37	61	65
QSS Group Inc.	183	118	110	63
Mississippi Space Services	65	53	79	61

Source: National Aeronautics and Space Administration, Office of Procurement, *Annual Procurement Report for Fiscal Year 2007*.

Note: Listed by rank according to net value of prime contracts awarded during last fiscal year.

a. Awards are also given to non-business firms, which include educational institutions, non-profit organizations, the Jet Propulsion Laboratory, government agencies, and outside U.S. contracts.

b. Not in top 100 companies for indicated year(s).

**STANDARD INDUSTRIAL CLASSIFICATIONS
APPLICABLE TO THE AEROSPACE INDUSTRY**

<p>3721 AIRCRAFT</p> <ul style="list-style-type: none"> 37211 Military aircraft 37215 Civilian aircraft 37217 Modification, conversion, and overhaul of previously accepted aircraft 37218 Aeronautical services on complete aircraft, nec <p>3724 AIRCRAFT ENGINES AND ENGINE PARTS</p> <ul style="list-style-type: none"> 37241 Aircraft engines for military aircraft 37242 Aircraft engines for civilian aircraft 37243 Aeronautical services on aircraft engines 37244 Aircraft engine parts and accessories <p>3728 AIRCRAFT PARTS AND AUXILIARY EQUIPMENT, NEC</p> <ul style="list-style-type: none"> 37281 Aircraft parts and auxiliary equipment, nec 37282 Aircraft propellers and helicopter rotors 37283 Research and development on aircraft parts and auxiliary <p>3761 GUIDED MISSILES AND SPACE VEHICLES</p> <ul style="list-style-type: none"> 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 <p>3663 RADIO AND TELEVISION COMMUNICATIONS EQUIPMENT</p> <ul style="list-style-type: none"> 36631 Communication systems and equipment, except broadcast 	<p>3764 SPACE PROPULSION UNITS AND PARTS</p> <ul style="list-style-type: none"> 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 <p>3769 SPACE VEHICLE EQUIPMENT, NEC</p> <ul style="list-style-type: none"> 37692 Missile and space vehicle components, parts and subassemblies, nec 37694 Research and development on missile and space vehicle parts and components, nec <p>3669 COMMUNICATIONS EQUIPMENT, NEC</p> <ul style="list-style-type: none"> 36691 Alarm systems 36692 Traffic control equipment 36693 Intercommunication equipment <p>3812 SEARCH, DETECTION, NAVIGATION, GUIDANCE, AERONAUTICAL AND NAUTICAL SYSTEMS, INSTRUMENTS, AND EQUIPMENT</p> <ul style="list-style-type: none"> 38121 Aeronautical, nautical, and navigational instruments, not sending or receiving radio signals 38122 Search, detection, navigation, and guidance systems and equipment <p>3829 MEASURING AND CONTROLLING DEVICES, NEC</p> <ul style="list-style-type: none"> 38291 Aircraft engine instruments except flight
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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.

**NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM CODES
APPLICABLE TO THE AEROSPACE INDUSTRY**

33641	Aerospace products & parts mfg	336419	Other guided missile & space vehicle parts & auxiliary equip mfg
336411	Aircraft mfg	3327221	Aircraft (including aerospace) fasteners other than plastics (meet specifications for flying vehicles)
3364112	Military aircraft	332912	Fluid power valve and hose fitting mfg
3364113	Civilian aircraft	3329121	Aerospace type hydraulic fluid power valves
3364115	Modification, conversion, and overhaul of previously accepted aircraft	3329123	Aerospace type pneumatic fluid power valves
3364117	Other aeronautical services on complete aircraft, nec	332912F	Aerospace type hydraulic and pneumatic fluid power hose or tube end fittings and assemblies
336412	Aircraft engine & engine parts mfg	33399	All other general purpose machinery mfg
3364121	Military aircraft engines	3339957	Aerospace type fluid power cylinders and actuators, hydraulic and pneumatic
3364123	Civilian aircraft engines	3339967	Aerospace type fluid power pumps and motors
3364125	Aeronautical services on aircraft engines	3339996	Aerospace type hydraulic and pneumatic filters
3364127	Aircraft engine parts and accessories	3342201	Communication systems and equipment, except broadcast, but including microwave equipment, and space satellites
336413	Other aircraft parts and auxiliary equipment mfg	334290	Alarm systems, traffic control equipment, and intercommunication systems mfg
3364131	Aircraft propellers and helicopter rotors	334511	Search, detection, navigation, guidance, aeronautical, and nautical systems and instrument mfg
3364133	Developing and making prototypes of aircraft parts (except engines)	3345111	Aeronautical, nautical, and navigational instruments, not sending or receiving radio signals except engine instruments
3364136	Aircraft parts and auxiliary equipment, excluding hydraulic and pneumatic subassemblies and engines	3345113	Search, detection, navigation, and guidance systems and equipment
336414	Guided missile & space vehicle mfg	334511W	Search, detection, navigation, guidance, aeronautical, and nautical systems and instruments mfg, nsk
3364141	Complete guided missiles	3345192	Aircraft engine instruments mfg, except flight
3364143	Research and development on complete guided missiles		
3364145	Other services on complete guided missiles		
3364147	Complete space vehicles (excluding propulsion systems)		
3364149	Developing and making prototypes of complete space vehicles		
336414A	All other services on complete space vehicles		
3364145	Guided missile & space vehicle propulsion unit & parts mfg		
3364151	Complete missile or space vehicle engines and/or propulsion units		
3364153	Developing and making prototypes of complete missile or space vehicle engines and propulsion units		
3364155	Other services on complete missile or space vehicle engines and/or propulsion units		
3364157	Missile and space vehicle engine and/or propulsion parts and accessories		

Source: Office of Management and Budget, "North American Industry Classification System, United States, 2007."

GLOSSARY

Aeronautics: the science and art of designing and constructing aircraft, also, the art or science of operating aircraft.

Aerospace Employment: annual average calculated as one-twelfth of sum of monthly estimates of total number of persons employed during a designated pay period by the aircraft, missile, space vehicle (NAICS 33641), and search, detection, and navigation instruments (NAICS 334451) manufacturing industries.

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

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

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

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

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

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

Aircraft Agreement (Agreement on Trade in Civil Aircraft): negotiated 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 Economic Analysis (BEA): an agency of the Department of Commerce.

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

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

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

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

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

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

DoD: Department of Defense.

DoE: Department of Energy.

DoT: Department of Transportation.

Durable Goods Industry: comprised of major manufacturing industry groups with NAICS codes 321, 327, and 33. All major manufacturing industry groups in NAICS codes 31 and 322-326 are considered nondurable goods manufacturing industry groups.

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

Average Hourly Earnings: on a "gross" basis, reflecting not only changes in basic hourly and incentive wage rates, but also such variable factors as: premium pay for overtime, late shift work, and changes in output of workers paid for an incentive plan.

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

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

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

Expenditures (Federal Budget): see *Outlays*.

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

effect of its activities on small business, the domestic economy, and U.S. employment.

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

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

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

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

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

Footnotes: common to many tables throughout this edition are the following:

E	Estimate.
NA	Not available/Not applicable.
p	Preliminary.
r	Revised.
Tr.Qtr.	<i>Transition Quarter.</i>
NOTE:	Detail may not add to totals because of rounding.

Foreign Military Sales (FMS): export sales to foreign governments arranged

through the Department of Defense, whereby *DoD* recovers full purchase price and administrative costs; often mistakenly used to include foreign military aid and foreign commercial sales as well.

FY: see *Fiscal Year*.

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

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

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

Helicopter: a rotary-wing *aircraft* which depends principally for its support and motion in the air upon the lift generated by one or more power-driven rotors, rotating on substantially vertical axes. A helicopter is a *V/STOL*.

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

Helistop: a minimum facility *heliport*, but without such auxiliary facilities as: waiting room, hangar parking, etc.

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

Imports: classified as “general imports” or “imports for consumption.” This volume refers generally to “imports for consumption,” which are entries for immediate consumption plus merchandise withdrawn from bonded storage

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

Income:

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

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

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

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

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

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

MDA: Missile Defense Agency, an agency of the Department of Defense.

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, that is, a weapon which has an integral system of guidance, as opposed to the unguided rocket.

NAICS (North American Industry Classification System): a system developed by Canada, Mexico, and the U.S. government that groups *establishments* into industries based on a production-oriented concept in order to provide uniformity and comparability of statistical data and facilitate economic analyses between industries and the three North American countries.

NASA: National Aeronautics and Space Administration.

NATO: North Atlantic Treaty Organization.

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

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

OASD: Office of the Assistant Secretary of Defense.

Obligations (Federal Budget): commitments made by Federal agencies to pay out money for products, services, or other purposes—as distinct from the

actual payments. Obligations incurred may not be larger than *budget authority*.

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

Other Aerospace Products and

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

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

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

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

Passenger-Mile: one passenger moved one mile.

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

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

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

RDT&E (Department of Defense):

Research, Development, Test, and Evaluation.

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

Research: see *Research and Development*.

Research and Development:

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

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

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

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

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

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

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

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

In addition to AIA's own aerospace sales figure (pages 12-13), AIA reports two unique aerospace sales figures derived from two different U.S. Census Bureau sources. Data included in page 16, and AIA's Statistic Series 8 (Balance Sheet and Income Statement for Aerospace Industry) and Economic Indicators reports are from the Quarterly Financial Report (QFR). Data reported on page 16 and 17 are derived from the Current Industrial Report (CIR).

Both the CIR and QFR surveys categorize data according to the North

American Industry Classification System (NAICS). The CIR captures aerospace related activities within individual establishments, as identified by NAICS codes. The QFR assigns a single NAICS code to entire conglomerates, based upon the firm's dominant activity. Consequently, the QFR may include non-aerospace-related sales if a diversified firm's predominant line of business is aerospace. Conversely, aerospace sales will be excluded if the firm's predominant line of business is not aerospace-related.

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. Beginning in 1997, progressively superseded by *NAICS (North American Industry Classification System)*.

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 “turbo-prop” or “turbojet.”

UAV: Unmanned Aerial Vehicle

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.

USMC: United States Marine Corps, an agency of the U.S. Department of Defense.

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

Utility Aircraft: an aircraft designed for general purpose flying.

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

World Trade Organization (WTO): established in 1995 as a result of the “Uruguay Round” negotiations which included a major revision of the *General Agreement on Tariffs and Trade (GATT)*. The WTO’s overriding objective is to help trade flow smoothly, freely, fairly, and predictably.

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