

**AEROSPACE**  
**FACTS &**  
**FIGURES**  
**1995-96**

**AEROSPACE  
FACTS &  
FIGURES  
1995-96**

## **Published by:**

Aerospace Industries Association  
of America, Inc.  
1250 Eye Street, N.W.  
Washington, D.C. 20005-3924

For information about orders,  
call (202) 371-8561

For information about content,  
call (202) 371-8563

FAX (202) 371-8470

## **Compiled by:**

Economic Data Service  
Aerospace Research Center  
Aerospace Industries Association  
of America, Inc.

*Executive Director, Research Center*  
Virginia C. Lopez

*Manager, Economic Data Service*  
David H. Napier

*Editorial Consultant*  
James J. Haggerty

*Design*  
AAH Graphics, Inc.

Copyright ©1995 by Aerospace Industries Association of America, Inc.  
Library of Congress Catalog No. 46-25007  
International Standard Book No. 0898-4425

# **Acknowledgments**

---

Air Transport Association of America

Council of Economic Advisers

Export-Import Bank of the United States

Exxon International Company

General Aviation Manufacturers Association

Helicopter Association International

International Civil Aviation Organization

National Aeronautics and Space Administration

National Science Foundation

Office of Management and Budget

U.S. Department of Commerce  
(Bureau of Economic Analysis;  
Bureau of the Census;  
International Trade  
Administration)

U.S. Department of Defense  
(Air Force; Army; Ballistic Missile  
Defense Organization;  
Comptroller; Directorate for  
Information Operations and  
Reports; Navy)

U.S. Department of Labor  
(Bureau of Labor Statistics)

U.S. Department of Transportation  
(Federal Aviation Administration,  
Office of Airline Statistics)



# **Contents**

---

|                                |     |
|--------------------------------|-----|
| Foreword .....                 | 6   |
| Aerospace Summary .....        | 8   |
| Aircraft Production .....      | 26  |
| Missile Programs .....         | 48  |
| Space Programs .....           | 58  |
| Air Transportation .....       | 74  |
| Research and Development ..... | 100 |
| Foreign Trade .....            | 116 |
| Employment .....               | 138 |
| Finance .....                  | 154 |
| Glossary .....                 | 164 |
| Index .....                    | 171 |
| AIA Members .....              | 176 |

# Foreword

---

The aerospace year 1994 was remarkably similar to its predecessor, a time of further-declining industry activity. As expected, defense sales continued to fall in the ninth year of the nation's defense restructuring effort. But sales of commercial aircraft plunged even more precipitously, by 33 percent, as the recession in airline transport purchases persisted. For the second year in a row, sales of space systems also declined.

Therefore, the industry experienced activity reductions in all three of its principal business components with the result that sales dropped some 10 percent and the backlog of orders fell 11 percent.

There was a bright spot amid the gloom: the industry's continuing impressive trade performance. Aerospace exports actually declined from the previous year's level, as did the trade balance, but those drops were viewed as consequences of a generally depressed global aerospace market. The industry's trade performance was, in fact, excellent, heartening evidence that U.S. aerospace manufacturers have been able to maintain their competitiveness despite years of enforced reductions in facilities and labor skills.

The industry downsizing occasioned by the need to adjust to the realities of sharply lower defense

and commercial activity continued to take its toll. By year-end 1994, the industry's overall sales level was more than 20 percent below its peak level of 1991 and the workforce had been reduced by some 462,000 employees—more than a third of the number at the employment peak only five years earlier.

The industry's transition is by no means completed, nor is the declining trend in appropriations for defense production. Analysts see, for the remaining years of the 20th century, further reduced defense activity, additional facility shrinkage, and more loss of employees.

The aerospace/defense industry had looked forward to 1999, the Administration's stated target year for completing the defense restructuring, as a time of renewed stability in defense production. However, although the Department of Defense may complete the reduction in military strength by 1999, there are indications that the modernization element of the restructuring program will be deferred until after 2000. This introduces a new level of uncertainty in industry planning, because production of existing defense systems is winding down and manufacturers do not know when they will be able to begin production of advanced equipment now in development. They can only

---

assume that the dictates of national security in a volatile world will command a level of appropriations sufficient to carry out essential force modernization early in the 21st century.

Fabrication of space systems, which in 1994 became the second largest area of industry sales (after military aircraft), is expected to continue at something close to current levels through the early years of the new century, with gradually increasing commercial sales offsetting austere government funding.

Commercial aircraft manufacture offers the greatest promise for the industry's future. A consensus of market projections predicts an enormous commercial transport market in the neighborhood of \$1 trillion over the 20-year span 1995-2015. Demand of that order will boost jetliner production to unprecedented levels, but probably not until after 2000; the extended financial difficulties of the airlines have left many of them with heavy debt and restricted their abilities to initiate immediate reequipment programs. So the uptrend in jetliner purchases is expected to be moderate in near-future years, accelerating to new

record levels after the turn of the century.

The aerospace outlook, therefore, is for further compression of the industry during a now-lengthened period of transition until defense production stabilizes in the first decade of the new century. The industry that emerges will be smaller and leaner, oriented primarily toward manufacture of commercial aircraft, buttressed by moderate defense and space activity.

The challenge for the industry is to complete the transition without further loss of technological capability or competitiveness. The impressive manner in which our companies have handled the myriad difficulties of enforced downsizing thus far lends encouragement to the belief that they will successfully manage the remaining transition and retain world leadership in aerospace manufacture.



A handwritten signature in blue ink that reads "Don Fuqua". The signature is stylized and includes a long horizontal line extending to the right.

Don Fuqua  
President  
Aerospace Industries  
Association

# Aerospace Summary

---

**T**he aerospace year 1994 was more or less a mirror image of its predecessor, characterized by substantial reductions in overall sales and in every product category. With three principal business components—defense, space, and commercial aircraft—simultaneously in decline, sales fell almost 10 percent after an 11 percent drop in 1993.

The year-end backlog declined by 11 percent. The bright spot in an otherwise bleak picture was an upturn in net new orders, a gain of 14 percent after four years of decline, auguring an improvement in the industry's activity in near-future years.

Here is a breakdown of the industry's 1994 performance:

*Sales.* Industry sales amounted to \$111.2 billion, compared with \$123.4 billion in 1993. Even after seven years of declining defense production, the Department of Defense (DoD) remained the industry's principal customer. Defense sales amounted to \$44 billion, down from \$46.4 billion. Sales to non-U.S. government customers, half of which represented deliveries of airline transports, came to \$36.7 billion, down from \$44.1 billion.

Aircraft deliveries predominated in a breakdown of sales by product group. Sales of aircraft, engines, and parts, civil and military combined, totaled \$58.1 billion,

or 52 percent of sales; this compares with \$66.3 billion in 1993.

After two years in which civil aircraft sector sales topped sales of military aircraft products and services, military aircraft once again took No. 1 ranking among the product groups. Sales of military aircraft products and services amounted to \$32.1 billion (down from \$32.5 billion). Civil aircraft sector sales, at \$26 billion, were down significantly from \$33.8 billion in 1993.

Space sector sales experienced their second consecutive drop after 19 years of consistent increase; 1994 sales came to \$26.7 billion, down from \$28.5 billion.

Sales of missile systems, parts, and services continued the downward trend in evidence since 1990, down to \$7.9 billion from \$8.1 billion in 1993. "Related products and services" sales were \$18.6 billion, down from \$20.6 billion.

For 1994, aerospace industry sales amounted to 1.7 percent of the nation's Gross Domestic Product, down from 1.9 percent. Aerospace sales represented 3.3 percent of total sales by all U.S. manufacturing industries.

*Earnings.* The industry reported net income after taxes of \$5.7 billion, technically an all-time high. However, much of the profit stemmed from sales of assets, reduced payroll costs, and lower levels



---

of investment in research and development and plant and equipment.

As a percentage of sales, the industry's net profits after taxes came to 4.7 percent; the average for all U.S. manufacturing was 5.4 percent. As a percentage of assets, the aerospace figure was 4.3 percent, the all-industry average 5.8 percent.

**T**he aerospace balance sheet, reported by the Bureau of the Census, showed an increase in net working capital from \$14.2 billion in 1993 to \$15.7 billion in 1994. Total assets declined to \$132.3 billion from 1993's \$132.7 billion.

*Orders and Backlog.* After four years of decline, net new orders for aerospace systems increased to \$87 billion in 1994, compared with \$76.5 billion in 1993. Orders from military agencies totaled \$52.9 billion (up from \$45 billion) and non-military orders came to \$34 billion (up from \$31.5 billion).

The industry's backlog, however, continued on the downward trend that began in 1990. At year-end 1994 it was \$183.5 billion, down from \$207.1 billion.

At \$107 billion (down from \$121.2 billion), the non-military backlog was 58 percent of the total. The military component was \$76.5 billion, down from \$85.8 billion.

*Civil Aircraft Production.*

Since the mid-1980s, commercial aircraft production has accounted for

upwards of 80 percent of the value of all U.S.-built civil aircraft. In 1994, commercial transport manufacture accounted for \$18.1 billion, or 88 percent, of the \$20.7 billion worth of civil aircraft shipped (the \$20.7 billion figure does not match the \$26 billion reported in the breakdown by category on page 15 because the latter includes engine and parts sales). Both the commercial transport and the civil aircraft totals represent declines from 1993, when the total was \$26.4 billion and transport sales amounted to \$24.1 billion.

General aviation production continued on the rebound that began in 1993 after a long, steep decline from the peak year 1978. Sales totaled \$2.4 billion, up from \$2.1 billion in 1993. The industry produced 928 planes, down from 964.

Sales of civil helicopters also showed improvement. In 1994, the industry turned out 308 rotary-wing aircraft worth \$185 million; the figures for 1993 were 258 units valued at \$113 million.

Total backlog for commercial transport aircraft declined from \$77.7 billion at year-end 1993 to \$67.7 billion, and from 1,356 orders on the books to 1,126. Some 63 percent of the backlog value was in orders from foreign customers.

*Military Aircraft Production.*

According to AIA statistics, military



---

aircraft sector sales in 1994 were \$32.1 billion, down from \$32.5 billion in 1993. The Bureau of the Census, whose data do not include the substantial military investment in Research, Development, Test, and Evaluation (RDT&E), reported aircraft sales to military customers at \$20.4 billion (up from \$15.4 billion).

Net new orders for military aircraft, engines, and parts (Census data) came to \$22.6 billion, up from \$15 billion in 1993. However, the backlog declined to \$36.1 billion at year-end 1994 from \$36.7 billion.

*Foreign Trade.* The industry recorded an excellent performance in international trade, but a depressed global market caused a decline in exports and trade balance.

Exports totaled \$37.4 billion, five percent below 1993's \$39.4 billion. At \$25 billion, the trade balance was down 8.2 percent from the previous year's \$27.2 billion. U.S. aerospace imports, at \$12.4 billion, were up only slightly from the level of the previous year.

In dollar value, 53 percent of the civil export

volume (\$30 billion) was in sales of airline transports. Military exports, at \$7.3 billion, were down from 1993's \$7.6 billion.

*Space Systems.* AIA estimated sales of space systems, civil and military combined (including RDT&E), at \$26.7 billion, down from \$28.5 billion. Using a reporting basis that excludes launch vehicle engines/motors, spacecraft orbital adjustment systems, and RDT&E outlays, the Bureau of the Census reported a gain of more than 23 percent: sales of \$10.3 billion in 1994, compared with \$8.3 billion in 1993.

Census reported net new orders (again excluding RDT&E and propulsion systems) totaling \$8.8 billion, down from \$9.7 billion. Military orders, at \$4.9 billion, were



---

close to 1993's level, but non-military orders were down, from \$4.6 billion in 1993 to \$3.9 billion.

The industry's backlog of orders for space systems at year-end 1994 was \$13.1 billion, down from \$15.2 billion in 1993.

*Missile Systems.* Sales of missile systems (including RDT&E) continued on the downward trend in evidence throughout the 1990s. AIA reported sales of \$7.9 billion in 1994, down slightly from \$8.1 billion in the previous year. The Bureau of the Census, whose figures do not include missile propulsion units, showed sales of \$5.3 billion, down from 1993's \$7.7 billion.

Net new orders (Census data) amounted to only \$2.8 billion in 1994, compared with \$4.8 billion in the previous year. The backlog for missile systems was \$6 billion, down 36 percent from \$9.3 billion.

*Research and Development.* Federal government funding for research and development (R&D) reached an all-time high of \$68.5 billion in 1994, but it was a hollow record in that outlays actually declined in constant dollar terms.

The Office of Management and Budget (OMB) projected Fiscal Year (FY) 1995 total federal R&D outlays of \$68.9 billion, another decline in constant dollars. OMB estimates FY 1996 outlays at \$69.4 billion, which

would be a current-dollar "record" but a moderate decrease in constant dollars. The DoD would spend \$35.2 billion, more than half the total; NASA, \$8.7 billion (down slightly); and the Department of Energy \$6.3 billion (up slightly).

In 1994, funding for R&D in the U.S. amounted to \$169.1 billion, up from \$165.8 billion in the previous year, according to the National Science Foundation. Industry funding, at \$99.7 billion, was 59 percent of the total, federal funding (\$61 billion) more than 36 percent, colleges & universities (\$5.4 billion) more than three percent, and nonprofit institutions (\$3 billion) less than two percent. The bulk of R&D was performed by industry (71 percent).

*Employment.* Under the pressure of recessions in defense production and commercial aircraft manufacture, and with space activity at a stagnant level, aerospace employment continued its downward slide.

On an annual average basis, the labor force was reduced by almost 12 percent to a level of 852,000. This was the fifth straight decline since the industry's peak employment level in 1989; the cumulative manpower loss over these five years represented more than 35 percent of the peak total. Further decline was indicated for 1995.

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

|      |  |  |       |   |
|------|--|--|-------|---|
| 3721 | <b>AIRCRAFT</b>                                      | 37211 Military aircraft  | 3764  | <b>SPACE PROPULSION UNITS AND PARTS</b>   |
|      |  | 37215 Civilian aircraft  | 37645 | Complete missile or space vehicle engines and/or propulsion units   |
|      |  | 37217 Modification, conversion, and overhaul of previously accepted aircraft | 37646 | Research and development on complete missile or space vehicle engines and/or propulsion units                 |
|      |  | 37218 Aeronautical services on complete aircraft, nec                        | 37647 | Services on complete guided missile or space vehicle engines and/or propulsion units, nec                     |
| 3724 | <b>AIRCRAFT ENGINES AND ENGINE PARTS</b>             | 37241 Aircraft engines for military aircraft                                 | 37648 | Missile and space vehicle engine and/or propulsion unit parts and accessories                                 |
|      |  | 37242 Aircraft engines for civilian aircraft                                 | 3769  | <b>SPACE VEHICLE EQUIPMENT, NEC</b>   |
|      |  | 37243 Aeronautical services on aircraft engines                              | 37692 | Missile and space vehicle components, parts and subassemblies, nec  |
|      |  | 37244 Aircraft engine parts and accessories                                  | 37694 | Research and development on missile and space vehicle parts and components, nec                               |
| 3728 | <b>AIRCRAFT PARTS AND AUXILIARY EQUIPMENT, NEC</b>   | 37281 Aircraft parts and auxiliary equipment, nec                            | 3669  | <b>COMMUNICATIONS EQUIPMENT, NEC</b>  |
|      |  | 37282 Aircraft propellers and helicopter rotors                              | 36691 | Alarm systems   |
|      |  | 37283 Research and development on aircraft parts                             | 36692 | Traffic control equipment   |
| 3761 | <b>GUIDED MISSILES AND SPACE VEHICLES</b>            | 37611 Complete guided missiles (excluding propulsion systems)                | 36693 | Intercommunication equipment  |
|      |  | 37612 Complete space vehicles (excluding propulsion systems)                 | 3812  | <b>SEARCH, DETECTION, NAVIGATION, GUIDANCE, AERONAUTICAL AND NAUTICAL SYSTEMS, INSTRUMENTS, AND EQUIPMENT</b> |
|      |  | 37613 Research and development on complete guided missiles                   | 38121 | Aeronautical, nautical, and navigational instruments, not sending or receiving radio signals                  |
|      |  | 37614 Research and development on complete space vehicles                    | 38122 | Search, detection, navigation, and guidance systems and equipment   |
|      |  | 37615 All other services on complete guided missiles and space vehicles      | 3829  | <b>MEASURING AND CONTROLLING DEVICES, NEC</b>   |
| 3663 | <b>RADIO AND TELEVISION COMMUNICATIONS EQUIPMENT</b> | 36631 Communication systems and equipment, except broadcast                  | 38291 | Aircraft engine instruments, except flight  |

Source: Office of Management and Budget, "Standard Industrial Classification Manual, 1987."

NOTE: The Standard Industrial Classification (SIC) is a system developed by the U.S. Government to define the industrial composition of the economy, facilitating comparability of statistics. It is revised periodically to reflect the changing industrial composition of the economy.

NEC: Not elsewhere classified.

## AEROSPACE INDUSTRY SALES BY CUSTOMER

Calendar Years 1980–1994  
(Millions of Dollars)

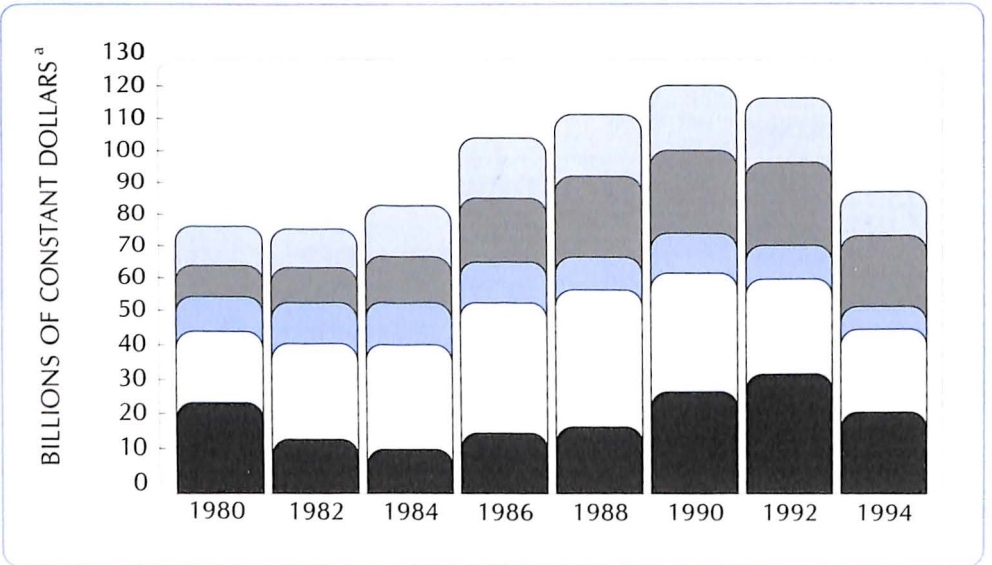
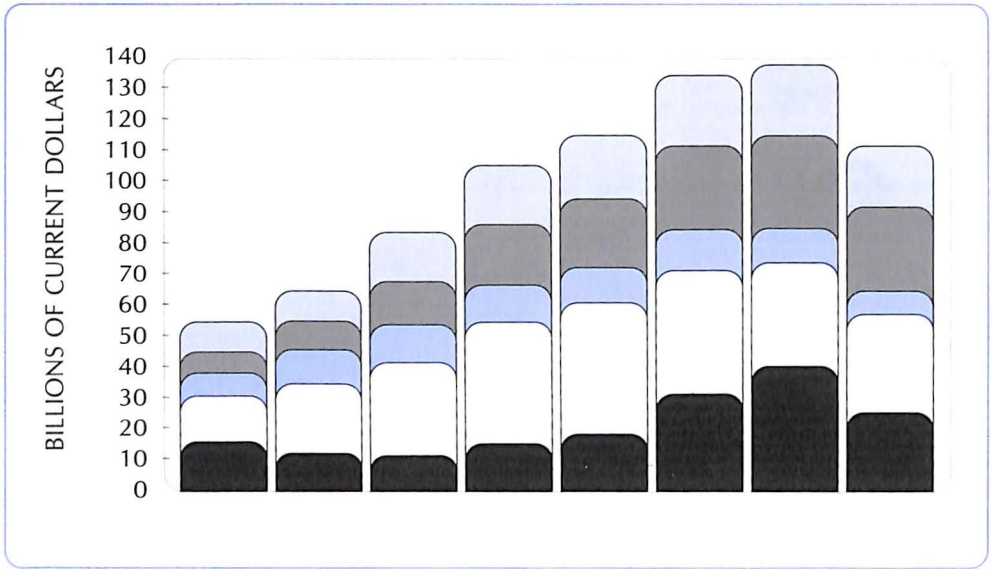
| Year                                | TOTAL SALES | Aerospace Products and Services |                  |                         |                 | Related Products and Services |
|-------------------------------------|-------------|---------------------------------|------------------|-------------------------|-----------------|-------------------------------|
|                                     |             | Total                           | U.S. Government  |                         | Other Customers |                               |
|                                     |             |                                 | Dept. of Defense | NASA and Other Agencies |                 |                               |
| <b>CURRENT DOLLARS</b>              |             |                                 |                  |                         |                 |                               |
| 1980                                | \$ 54,697   | \$ 45,878                       | \$22,795         | \$ 4,106                | \$18,977        | \$ 8,819                      |
| 1981                                | 63,974      | 53,090                          | 27,244           | 4,709                   | 21,137          | 10,884                        |
| 1982                                | 67,756      | 56,366                          | 34,016           | 4,899                   | 17,451          | 11,390                        |
| 1983                                | 79,975      | 66,646                          | 41,558           | 5,910                   | 19,178          | 13,329                        |
| 1984                                | 83,486      | 69,572                          | 45,969           | 6,063                   | 17,540          | 13,914                        |
| 1985                                | 96,571      | 80,476                          | 53,178           | 6,262                   | 21,036          | 16,095                        |
| 1986                                | 106,183     | 88,486                          | 59,161           | 6,236                   | 23,089          | 17,697                        |
| 1987                                | 110,008     | 91,673                          | 61,817           | 6,813                   | 23,043          | 18,335                        |
| 1988                                | 114,562     | 95,468                          | 61,327           | 7,899                   | 26,242          | 19,094                        |
| 1989                                | 120,534     | 100,445                         | 61,199           | 9,601                   | 29,645          | 20,089                        |
| 1990                                | 134,375     | 111,979                         | 60,502           | 11,097                  | 40,379          | 22,396                        |
| 1991                                | 139,248     | 116,040                         | 56,619           | 11,739                  | 48,379          | 23,208                        |
| 1992                                | 138,591     | 115,493                         | 52,202           | 12,408                  | 50,882          | 23,099                        |
| 1993 <sup>r</sup>                   | 123,416     | 102,847                         | 46,441           | 12,267                  | 44,139          | 20,569                        |
| 1994                                | 111,223     | 92,686                          | 44,013           | 11,936                  | 36,737          | 18,577                        |
| <b>CONSTANT DOLLARS<sup>a</sup></b> |             |                                 |                  |                         |                 |                               |
| 1980                                | \$ 77,475   | \$ 64,983                       | \$32,288         | \$ 5,816                | \$26,880        | \$12,492                      |
| 1981                                | 80,470      | 66,780                          | 34,269           | 5,923                   | 26,587          | 13,691                        |
| 1982                                | 77,083      | 64,125                          | 38,699           | 5,573                   | 19,853          | 12,958                        |
| 1983                                | 86,741      | 72,284                          | 45,074           | 6,410                   | 20,800          | 14,457                        |
| 1984                                | 83,653      | 69,711                          | 46,061           | 6,075                   | 17,575          | 13,942                        |
| 1985                                | 97,843      | 81,536                          | 53,878           | 6,344                   | 21,313          | 16,307                        |
| 1986                                | 106,396     | 88,663                          | 59,280           | 6,248                   | 23,135          | 17,732                        |
| 1987                                | 110,008     | 91,673                          | 61,817           | 6,813                   | 23,043          | 18,335                        |
| 1988                                | 112,426     | 93,688                          | 60,184           | 7,752                   | 25,753          | 18,738                        |
| 1989                                | 113,604     | 94,670                          | 57,680           | 9,049                   | 27,941          | 18,934                        |
| 1990                                | 121,606     | 101,338                         | 54,753           | 10,043                  | 36,542          | 20,268                        |
| 1991                                | 121,508     | 101,257                         | 49,406           | 10,243                  | 42,216          | 20,251                        |
| 1992                                | 118,050     | 98,376                          | 44,465           | 10,569                  | 43,341          | 19,675                        |
| 1993 <sup>r</sup>                   | 102,166     | 85,138                          | 38,445           | 10,155                  | 36,539          | 17,027                        |
| 1994                                | 90,943      | 75,786                          | 35,988           | 9,760                   | 30,038          | 15,190                        |

Source: Aerospace Industries Association.

NOTE: See Glossary for explanation of "Aerospace Industry," "Aerospace Sales," "Other Customers," and "Related Products and Services."

<sup>a</sup> Based on AIA's aerospace composite price deflator, 1987=100.<sup>r</sup> Revised.

# Aerospace Sales by Product Group



- CIVIL AIRCRAFT
- MISSILES
- SPACE
- MILITARY AIRCRAFT
- RELATED PRODUCTS AND SERVICES

SOURCE: AEROSPACE INDUSTRIES ASSOCIATION

<sup>a</sup> BASED ON AIA'S AEROSPACE COMPOSITE PRICE DEFLATOR (1987 = 100)



## AEROSPACE INDUSTRY SALES BY PRODUCT GROUP

Calendar Years 1980–1994  
(Millions of Dollars)

| Year                                | TOTAL SALES | Aircraft |                     |          | Missiles | Space    | Related Products & Services |
|-------------------------------------|-------------|----------|---------------------|----------|----------|----------|-----------------------------|
|                                     |             | Total    | Civil               | Military |          |          |                             |
| <b>CURRENT DOLLARS</b>              |             |          |                     |          |          |          |                             |
| 1980                                | \$ 54,697   | \$31,464 | \$16,285            | \$15,179 | \$ 6,469 | \$ 7,945 | \$ 8,819                    |
| 1981                                | 63,974      | 36,062   | 16,427              | 19,635   | 7,640    | 9,388    | 10,884                      |
| 1982                                | 67,756      | 35,484   | 10,982              | 24,502   | 10,368   | 10,514   | 11,390                      |
| 1983                                | 79,975      | 42,431   | 12,373              | 30,058   | 10,269   | 13,946   | 13,329                      |
| 1984                                | 83,486      | 41,905   | 10,690              | 31,215   | 11,335   | 16,332   | 13,914                      |
| 1985                                | 96,571      | 50,482   | 13,730              | 36,752   | 11,438   | 18,556   | 16,095                      |
| 1986                                | 106,183     | 56,405   | 15,718              | 40,687   | 11,964   | 20,117   | 17,697                      |
| 1987                                | 110,008     | 59,188   | 15,465              | 43,723   | 10,219   | 22,266   | 18,335                      |
| 1988                                | 114,562     | 60,886   | 19,019              | 41,867   | 10,270   | 24,312   | 19,094                      |
| 1989                                | 120,534     | 61,550   | 21,903              | 39,646   | 13,622   | 25,274   | 20,089                      |
| 1990                                | 134,375     | 71,353   | 31,262 <sup>r</sup> | 40,091   | 14,180   | 26,446   | 22,396                      |
| 1991                                | 139,248     | 75,918   | 37,443              | 38,475   | 10,970   | 29,152   | 23,208                      |
| 1992                                | 138,591     | 73,905   | 39,897              | 34,008   | 11,757   | 29,831   | 23,099                      |
| 1993 <sup>r</sup>                   | 123,416     | 66,258   | 33,750              | 32,508   | 8,080    | 28,509   | 20,569                      |
| 1994                                | 111,223     | 58,088   | 25,983              | 32,105   | 7,903    | 26,695   | 18,577                      |
| <b>CONSTANT DOLLARS<sup>a</sup></b> |             |          |                     |          |          |          |                             |
| 1980                                | \$ 77,475   | \$44,567 | \$23,067            | \$21,500 | \$ 9,163 | \$11,254 | \$12,492                    |
| 1981                                | 80,470      | 45,361   | 20,663              | 24,698   | 9,610    | 11,809   | 13,691                      |
| 1982                                | 77,083      | 40,369   | 12,494              | 27,875   | 11,795   | 11,961   | 12,958                      |
| 1983                                | 86,741      | 46,021   | 13,420              | 32,601   | 11,138   | 15,126   | 14,457                      |
| 1984                                | 83,653      | 41,989   | 10,711              | 31,278   | 11,358   | 16,365   | 13,942                      |
| 1985                                | 97,843      | 51,147   | 13,911              | 37,236   | 11,589   | 18,800   | 16,307                      |
| 1986                                | 106,396     | 56,518   | 15,749              | 40,769   | 11,988   | 20,157   | 17,732                      |
| 1987                                | 110,008     | 59,188   | 15,465              | 43,723   | 10,219   | 22,266   | 18,335                      |
| 1988                                | 112,426     | 59,751   | 18,664              | 41,086   | 10,079   | 23,859   | 18,738                      |
| 1989                                | 113,604     | 58,011   | 20,644              | 37,367   | 12,839   | 23,821   | 18,934                      |
| 1990                                | 121,606     | 64,573   | 28,291 <sup>r</sup> | 36,281   | 12,833   | 23,933   | 20,268                      |
| 1991                                | 121,508     | 66,246   | 32,673              | 33,573   | 9,572    | 25,438   | 20,251                      |
| 1992                                | 118,050     | 62,951   | 33,984              | 28,968   | 10,014   | 25,410   | 19,675                      |
| 1993 <sup>r</sup>                   | 102,166     | 54,849   | 27,939              | 26,911   | 6,689    | 23,600   | 17,027                      |
| 1994                                | 90,943      | 47,496   | 21,245              | 26,251   | 6,462    | 21,827   | 15,190                      |

Source: Aerospace Industries Association.

NOTE: See Glossary for explanation of "Aerospace Industry," "Aerospace Sales," "Other Customers," and "Related Products and Services."

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

r Revised.

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

Calendar Years 1980–1994  
(Millions of Dollars)

| Year                                 | GRAND TOTAL          | TOTAL    |          | Aircraft, Engines, & Parts |          | Missiles, Space, & Rocket Propulsion | Other Aerospace |          | Non-Aerospace       |
|--------------------------------------|----------------------|----------|----------|----------------------------|----------|--------------------------------------|-----------------|----------|---------------------|
|                                      |                      | Military | Non-Mil. | Military                   | Non-Mil. |                                      | Military        | Non-Mil. |                     |
| <b>CURRENT DOLLARS</b>               |                      |          |          |                            |          |                                      |                 |          |                     |
| 1980                                 | \$ 58,440            | \$26,666 | \$31,774 | \$10,973                   | \$18,561 | \$ 8,393                             | \$ 6,431        | \$3,047  | \$11,045            |
| 1981                                 | 69,944               | 33,876   | 36,068   | 14,575                     | 18,999   | 9,722                                | 7,634           | 3,905    | 15,109              |
| 1982                                 | 75,487               | 43,281   | 32,206   | 17,743                     | 14,143   | 11,980                               | 9,408           | 5,454    | 16,759              |
| 1983                                 | 83,453               | 50,525   | 32,928   | 19,809                     | 16,070   | 12,745                               | 12,310          | 3,179    | 19,340              |
| 1984                                 | 88,941               | 57,047   | 31,894   | 23,268                     | 14,017   | 13,624                               | 12,245          | 3,257    | 22,530              |
| 1985                                 | 100,522              | 65,098   | 35,424   | 25,758                     | 18,182   | 16,741                               | 14,491          | 3,675    | 21,675              |
| 1986                                 | 105,577              | 68,303   | 37,274   | 27,043                     | 20,714   | 17,535                               | 16,287          | 3,520    | 20,478              |
| 1987                                 | 110,301              | 70,194   | 40,107   | 27,806                     | 21,256   | 20,715                               | 15,786          | 3,429    | 21,309              |
| 1988                                 | 113,548              | 69,448   | 44,100   | 25,068                     | 25,674   | 21,514                               | 16,382          | 2,946    | 21,964              |
| 1989                                 | 122,148              | 71,647   | 50,501   | 24,287                     | 29,539   | 22,643                               | 16,908          | 3,605    | 25,167              |
| 1990                                 | 136,646              | 73,616   | 63,030   | 27,667                     | 38,622   | 22,040                               | 15,773          | 4,342    | 28,202              |
| 1991                                 | 123,862              | 67,089   | 56,773   | 25,385                     | 43,155   | 23,311                               | 13,472          | 4,281    | 14,258              |
| 1992                                 | 118,736              | 61,410   | 57,326   | 23,509                     | 44,160   | 21,349                               | 12,153          | 3,377    | 14,188              |
| 1993                                 | 108,135 <sup>r</sup> | 53,291   | 54,844   | 15,374                     | 41,015   | 19,126 <sup>r</sup>                  | 11,936          | 3,592    | 15,179 <sup>r</sup> |
| 1994                                 | 100,332              | 54,622   | 45,710   | 20,400                     | 30,618   | 18,215                               | 11,968          | 4,086    | 15,045              |
| <b>CONSTANT DOLLARS <sup>a</sup></b> |                      |          |          |                            |          |                                      |                 |          |                     |
| 1980                                 | \$ 82,776            | \$37,771 | \$45,006 | \$15,528                   | \$26,290 | \$11,888                             | \$ 9,109        | \$4,316  | \$15,644            |
| 1981                                 | 87,980               | 42,611   | 45,369   | 18,333                     | 23,898   | 12,229                               | 9,603           | 4,912    | 19,005              |
| 1982                                 | 85,878               | 49,239   | 36,639   | 20,185                     | 16,090   | 13,629                               | 10,703          | 6,205    | 19,066              |
| 1983                                 | 90,513               | 54,799   | 35,714   | 21,485                     | 17,430   | 13,823                               | 13,351          | 3,448    | 20,976              |
| 1984                                 | 89,119               | 57,161   | 31,958   | 23,315                     | 14,405   | 13,651                               | 12,270          | 3,264    | 22,575              |
| 1985                                 | 101,846              | 65,955   | 35,891   | 26,097                     | 18,421   | 16,961                               | 14,682          | 3,723    | 21,960              |
| 1986                                 | 105,789              | 68,440   | 37,349   | 27,097                     | 20,756   | 17,570                               | 16,320          | 3,527    | 20,519              |
| 1987                                 | 110,301              | 70,194   | 40,107   | 27,806                     | 21,256   | 20,715                               | 15,786          | 3,429    | 21,309              |
| 1988                                 | 111,431              | 68,153   | 43,278   | 24,601                     | 25,195   | 21,113                               | 16,077          | 2,891    | 21,554              |
| 1989                                 | 115,125              | 67,528   | 47,598   | 22,891                     | 27,840   | 21,341                               | 15,936          | 3,398    | 23,720              |
| 1990                                 | 123,662              | 66,621   | 57,041   | 25,038                     | 34,952   | 19,946                               | 14,274          | 3,929    | 25,522              |
| 1991                                 | 108,082              | 58,542   | 49,540   | 22,151                     | 37,657   | 20,341                               | 11,756          | 3,736    | 12,442              |
| 1992                                 | 101,138              | 52,308   | 48,830   | 20,025                     | 37,615   | 18,185                               | 10,352          | 2,876    | 12,085              |
| 1993                                 | 89,516 <sup>r</sup>  | 44,115   | 45,401   | 12,727                     | 33,953   | 15,833 <sup>r</sup>                  | 9,881           | 2,974    | 12,565 <sup>r</sup> |
| 1994                                 | 82,038               | 44,662   | 37,375   | 16,680                     | 25,035   | 14,894                               | 9,786           | 3,341    | 12,302              |

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

Note: The detail necessary to report orders, sales, and backlog by customer (ie U.S. Gov't vs Other) has been withheld by the Census Bureau. Consequently, this table has been recomputed showing orders, sales, and backlog by application (ie Military vs Non-military).

<sup>a</sup> Based on AIA's aerospace composite price deflator, 1987=100.

<sup>r</sup> Revised.

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

Calendar Years 1980–1994  
(Millions of Dollars)

| Year                             | GRAND<br>TOTAL       | TOTAL               |                     | Aircraft, En-<br>gines, & Parts |              | Missiles,<br>Space, &<br>Rocket<br>Propul-<br>sion | Other<br>Aerospace |              | Non-<br>Aero-<br>space |
|----------------------------------|----------------------|---------------------|---------------------|---------------------------------|--------------|--|--------------------|--------------|------------------------|
|                                  |                      | Mili-<br>tary       | Non-<br>Mil.        | Mili-<br>tary                   | Non-<br>Mil. |  | Mili-<br>tary      | Non-<br>Mil. |                        |
| <b>NET NEW ORDERS</b>            |                      |                     |                     |                                 |              |  |                    |              |                        |
| 1980                             | \$ 69,624            | \$ 35,570           | \$ 34,054           | \$15,208                        | \$ 19,137    | \$ 9,818   | \$ 8,134           | \$3,181      | \$12,144               |
| 1981                             | 74,922               | 43,147              | 31,775              | 19,228                          | 15,208       | 12,172   | 9,367              | 1,925        | 14,803                 |
| 1982 <sup>a</sup>                | 89,168 <sup>a</sup>  | 60,759 <sup>a</sup> | 28,409 <sup>a</sup> | 24,186                          | 9,589        | 13,858   | 13,570             | 3,636        | 20,058                 |
| 1983                             | 91,647               | 62,053              | 29,594              | 26,231                          | 12,368       | 14,248   | 14,342             | 3,508        | 20,950                 |
| 1984                             | 104,863              | 69,654              | 35,209              | 29,894                          | 17,208       | 16,485   | 13,673             | 3,838        | 23,765                 |
| 1985                             | 110,968              | 70,978              | 39,990              | 28,201                          | 21,471       | 20,328   | 14,488             | 3,042        | 23,168                 |
| 1986                             | 110,836              | 70,132              | 40,704              | 24,124                          | 23,833       | 20,445   | 16,836             | 3,510        | 22,088                 |
| 1987                             | 121,224              | 67,594              | 53,630              | 19,347                          | 33,000       | 26,272   | 14,178             | 4,379        | 24,048                 |
| 1988                             | 147,128              | 69,209              | 77,919              | 24,242                          | 57,906       | 20,240   | 18,423             | 3,044        | 23,273                 |
| 1989                             | 173,635              | 79,992              | 93,643              | 28,818                          | 67,773       | 26,820   | 17,814             | 3,945        | 28,465                 |
| 1990                             | 145,965              | 56,405              | 89,560              | 17,735                          | 64,651       | 20,207   | 12,945             | 3,556        | 26,871                 |
| 1991                             | 122,485              | 63,017              | 59,468              | 26,675                          | 40,815       | 24,955   | 11,329             | 4,360        | 14,351                 |
| 1992                             | 100,306              | 57,383              | 42,923              | 16,631                          | 30,110       | 22,849   | 11,201             | 3,256        | 13,259                 |
| 1993 <sup>r</sup>                | 76,532               | 44,045              | 31,487              | 15,023                          | 16,085       | 16,180   | 11,121             | 4,630        | 13,494                 |
| 1994                             | 86,977               | 52,928              | 34,049              | 22,628                          | 19,450       | 14,049   | 12,728             | 4,415        | 13,707                 |
| <b>BACKLOG AS OF DECEMBER 31</b> |                      |                     |                     |                                 |              |  |                    |              |                        |
| 1980                             | \$ 89,732            | \$ 45,480           | \$ 44,252           | \$23,472                        | \$ 33,165    | \$ 8,941   | \$ 8,637           | \$ 3,618     | \$ 9,702               |
| 1981                             | 94,710               | 54,751              | 39,959              | 26,867                          | 29,045       | 11,255   | 9,701              | 2,482        | 12,925                 |
| 1982 <sup>a</sup>                | 108,391 <sup>a</sup> | 72,229 <sup>a</sup> | 36,162 <sup>a</sup> | 33,309                          | 24,845       | 13,125   | 13,864             | 1,790        | 16,538                 |
| 1983                             | 116,585              | 83,757              | 32,828              | 38,824                          | 21,548       | 14,962   | 18,483             | 3,690        | 19,078                 |
| 1984                             | 132,507              | 96,364              | 36,143              | 45,450                          | 24,739       | 17,823   | 19,911             | 4,271        | 20,313                 |
| 1985                             | 142,953              | 102,244             | 40,709              | 47,893                          | 28,298       | 21,410   | 19,908             | 3,638        | 21,806                 |
| 1986                             | 148,212              | 104,073             | 44,139              | 44,974                          | 31,417       | 24,320   | 20,457             | 3,628        | 23,416                 |
| 1987                             | 158,650              | 99,474              | 59,176              | 36,514                          | 43,501       | 30,544   | 18,937             | 4,604        | 24,550                 |
| 1988                             | 191,518              | 99,117              | 92,401              | 35,515                          | 75,765       | 29,078   | 20,584             | 4,734        | 25,842                 |
| 1989                             | 252,401              | 114,070             | 138,331             | 44,026                          | 115,124      | 33,771   | 24,186             | 7,652        | 27,642                 |
| 1990                             | 250,079              | 88,471              | 161,608             | 33,788                          | 139,152      | 31,648   | 18,501             | 4,999        | 21,991                 |
| 1991                             | 245,241              | 89,517              | 155,724             | 39,149                          | 134,527      | 32,657   | 17,213             | 4,907        | 16,788                 |
| 1992                             | 236,076              | 92,139              | 143,937             | 44,255                          | 124,322      | 32,933   | 14,886             | 4,859        | 14,821                 |
| 1993 <sup>r</sup>                | 207,058              | 85,813              | 121,246             | 36,725                          | 96,225       | 31,484   | 16,658             | 8,118        | 17,847                 |
| 1994                             | 183,458              | 76,491              | 106,967             | 36,090                          | 84,604       | 25,797   | 15,167             | 6,816        | 14,985                 |

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

Note: The detail necessary to report orders, sales, and backlog by customer (ie U.S. Gov't vs Other) has been withheld by the Census Bureau. Consequently, this table has been recomputed showing orders, sales, and backlog by application (ie Military vs Non-military).

<sup>a</sup> 1979 and 1982 Orders and Backlog Totals are final revisions for which product group detail is not available.

<sup>r</sup> Revised.

## AEROSPACE SALES AND THE NATIONAL ECONOMY

Calendar Years 1980-1994

(Billions of Dollars)

| Year                                | Gross Domestic Product | Industry Sales |               |                    | Aerospace Sales As Percent of         |               |               |              |
|-------------------------------------|------------------------|----------------|---------------|--------------------|---------------------------------------|---------------|---------------|--------------|
|                                     |                        | Manufacturing  | Durable Goods | Aero-space         | GDP                                   | Manufacturing | Durable Goods |              |
| <b>CURRENT DOLLARS</b>              |                        |                |               |                    |                                       |               |               |              |
| 1980                                | \$2,708.0              | \$1,853.2      | \$ 929.3      | \$ 54.7            | 2.0 %                                 | 3.0%          | 5.9 %         |              |
| 1981                                | 3,030.6                | 2,016.9        | 1,003.9       | 64.0               | 2.1                                   | 3.2           | 6.4           |              |
| 1982                                | 3,149.6                | 1,959.3        | 950.0         | 67.8               | 2.2                                   | 3.5           | 7.1           |              |
| 1983                                | 3,405.0                | 2,071.3        | 1,026.5       | 80.0               | 2.3                                   | 3.9           | 7.8           |              |
| 1984                                | 3,777.2                | 2,288.0        | 1,174.7       | 83.5               | 2.2                                   | 3.6           | 7.1           |              |
| 1985                                | 4,038.7                | 2,332.3        | 1,214.1       | 96.6               | 2.4                                   | 4.1           | 8.0           |              |
| 1986                                | 4,268.6                | 2,334.6        | 1,237.8       | 106.2              | 2.5                                   | 4.5           | 8.6           |              |
| 1987                                | 4,539.9                | 2,474.0        | 1,296.2       | 110.0              | 2.4                                   | 4.4           | 8.5           |              |
| 1988                                | 4,900.4                | 2,681.0        | 1,414.8       | 114.6              | 2.3                                   | 4.3           | 8.1           |              |
| 1989                                | 5,250.8                | 2,790.3        | 1,458.5       | 120.5              | 2.3                                   | 4.3           | 8.3           |              |
| 1990                                | 5,546.1                | 2,870.0        | 1,466.0       | 134.4              | 2.4                                   | 4.7           | 9.2           |              |
| 1991                                | 5,724.8                | 2,825.8        | 1,430.0       | 139.2              | 2.4                                   | 4.9           | 9.7           |              |
| 1992                                | 6,020.2                | 2,931.9        | 1,505.8       | 138.6              | 2.3                                   | 4.7           | 9.2           |              |
| 1993                                | 6,343.3                | 3,100.1        | 1,628.9       | 123.4 <sup>r</sup> | 1.9 <sup>r</sup>                      | 4.0           | 7.6           |              |
| 1994                                | 6,738.4                | 3,364.6        | 1,809.4       | 111.2              | 1.7                                   | 3.3           | 6.1           |              |
| <b>CONSTANT DOLLARS<sup>a</sup></b> |                        |                |               |                    |                                       |               |               |              |
|                                     |                        |                |               |                    | <b>Real Annual Growth<sup>b</sup></b> |               |               |              |
|                                     |                        |                |               |                    | <b>GDP</b>                            | <b>Mfg.</b>   | <b>Durs.</b>  | <b>Aero.</b> |
| 1980                                | \$3,776.3              | \$2,584.3      | \$1,296.0     | \$ 77.5            | (0.5)%                                | (1.9)%        | (6.7)%        | 8.3%         |
| 1981                                | 3,843.0                | 2,557.5        | 1,273.1       | 80.5               | 1.8                                   | (1.0)         | (1.8)         | 3.9          |
| 1982                                | 3,760.3                | 2,339.2        | 1,134.2       | 77.1               | (2.2)                                 | (8.5)         | (10.9)        | (4.2)        |
| 1983                                | 3,906.6                | 2,376.5        | 1,177.7       | 86.7               | 3.9                                   | 1.6           | 3.8           | 12.5         |
| 1984                                | 4,150.8                | 2,514.3        | 1,290.9       | 83.7               | 6.2                                   | 5.8           | 9.6           | (3.6)        |
| 1985                                | 4,279.6                | 2,471.5        | 1,286.5       | 97.8               | 3.1                                   | (1.7)         | (0.3)         | 17.0         |
| 1986                                | 4,404.3                | 2,408.8        | 1,277.2       | 106.4              | 2.9                                   | (2.5)         | (0.7)         | 8.7          |
| 1987                                | 4,539.9                | 2,474.0        | 1,296.2       | 110.0              | 3.1                                   | 2.7           | 1.5           | 3.4          |
| 1988                                | 4,718.7                | 2,581.6        | 1,362.4       | 112.4              | 3.9                                   | 4.4           | 5.1           | 2.2          |
| 1989                                | 4,839.4                | 2,571.7        | 1,344.2       | 113.6              | 2.6                                   | (0.4)         | (1.3)         | 1.0          |
| 1990                                | 4,895.1                | 2,533.1        | 1,293.9       | 121.6              | 1.1                                   | (1.5)         | (3.7)         | 7.0          |
| 1991 <sup>r</sup>                   | 4,868.0                | 2,402.9        | 1,216.0       | 121.5              | (0.6)                                 | (5.1)         | (6.0)         | (0.1)        |
| 1992 <sup>r</sup>                   | 4,979.5                | 2,425.1        | 1,245.5       | 118.1              | 2.3                                   | 0.9           | 2.4           | (2.8)        |
| 1993 <sup>r</sup>                   | 5,136.3                | 2,510.2        | 1,318.9       | 102.2              | 3.1                                   | 3.5           | 5.9           | (13.5)       |
| 1994                                | 5,339.5                | 2,666.1        | 1,433.8       | 90.9               | 4.0                                   | 6.2           | 8.7           | (11.0)       |

Source: Council of Economic Advisors, "Economic Indicators" (Monthly); Bureau of Census; and Aerospace Industries Association.

a Aerospace industry constant dollar sales based on AIA's aerospace composite price deflator, 1987=100. Others based on GDP implicit price deflator, 1987=100.

b Parentheses indicate negative real annual growth.

r Revised.

## GROSS DOMESTIC PRODUCT, FEDERAL BUDGET, AND DEFENSE BUDGET

Fiscal Years 1962–1996  
(Billions of Dollars)

| Year              | Fiscal Year<br>GDP   | Federal Budget Outlays    |                                  | Defense Outlays <sup>c</sup><br>as percent of |                   |
|-------------------|----------------------|---------------------------|----------------------------------|---|-------------------|
|                   |                      | Net<br>Total <sup>a</sup> | National<br>Defense <sup>b</sup> | GDP   | Federal<br>Budget |
| 1962              | \$ 555.2             | \$ 106.8                  | \$ 52.3                          | 9.4%  | 49.0%             |
| 1963              | 584.5 <sup>r</sup>   | 111.3                     | 53.4                             | 9.1   | 48.0              |
| 1964              | 625.3                | 118.5                     | 54.8                             | 8.8   | 46.2              |
| 1965              | 671.0                | 118.2                     | 50.6                             | 7.5   | 42.8              |
| 1966              | 735.4                | 134.5                     | 58.1                             | 7.9   | 43.2              |
| 1967              | 793.3                | 157.5                     | 71.4                             | 9.0   | 45.4              |
| 1968              | 847.2                | 178.1                     | 81.9                             | 9.7   | 46.0              |
| 1969              | 925.7                | 183.6                     | 82.5                             | 8.9   | 44.9              |
| 1970              | 985.4                | 195.6                     | 81.7                             | 8.3   | 41.8              |
| 1971              | 1,050.9              | 210.2                     | 78.9                             | 7.5   | 37.5              |
| 1972              | 1,147.8              | 230.7                     | 79.2                             | 6.9   | 34.3              |
| 1973              | 1,274.0              | 245.7                     | 76.7                             | 6.0   | 31.2              |
| 1974              | 1,403.6              | 269.4                     | 79.3                             | 5.7   | 29.5              |
| 1975              | 1,509.8              | 332.3                     | 86.5                             | 5.7   | 26.0              |
| 1976              | 1,684.2              | 371.8                     | 89.6                             | 5.3   | 24.1              |
| Tr. Qtr.          | 445.0                | 96.0                      | 22.3                             | 5.0   | 23.2              |
| 1977              | 1,917.2              | 409.2                     | 97.2                             | 5.1   | 23.8              |
| 1978              | 2,155.0              | 458.7                     | 104.5                            | 4.8   | 22.8              |
| 1979              | 2,429.5              | 503.5                     | 116.3                            | 4.8   | 23.1              |
| 1980              | 2,644.1              | 590.9                     | 134.0                            | 5.1   | 22.7              |
| 1981              | 2,964.4              | 678.2                     | 157.5                            | 5.3   | 23.2              |
| 1982              | 3,122.2              | 745.8                     | 185.3                            | 5.9   | 24.8              |
| 1983              | 3,316.5              | 808.4                     | 209.9                            | 6.3   | 26.0              |
| 1984              | 3,695.0              | 851.8                     | 227.4                            | 6.2   | 26.7              |
| 1985              | 3,967.7              | 946.4                     | 252.7 <sup>b</sup>               | 6.4   | 26.7              |
| 1986              | 4,219.0              | 990.3                     | 273.4                            | 6.5   | 27.6              |
| 1987              | 4,452.4              | 1,003.9                   | 282.0                            | 6.3   | 28.1              |
| 1988              | 4,808.4              | 1,064.1                   | 290.4                            | 6.0   | 27.3              |
| 1989              | 5,173.3              | 1,143.2                   | 303.6                            | 5.9   | 26.6              |
| 1990              | 5,481.5              | 1,252.7                   | 299.3                            | 5.5   | 23.9              |
| 1991 <sup>r</sup> | 5,676.4              | 1,323.4                   | 273.3 <sup>c</sup>               | 4.8   | 20.7              |
| 1992              | 5,921.5 <sup>r</sup> | 1,380.9                   | 298.4 <sup>c</sup>               | 5.0 <sup>r</sup>                              | 21.6              |
| 1993 <sup>r</sup> | 6,258.6              | 1,408.7                   | 291.1 <sup>c</sup>               | 4.7   | 20.7              |
| 1994              | 6,633.6              | 1,460.9                   | 281.6                            | 4.2   | 19.3              |
| 1995 <sup>E</sup> | 7,024.1              | 1,538.9                   | 271.6                            | 3.9   | 17.6              |
| 1996 <sup>E</sup> | 7,407.0              | 1,612.1                   | 261.4                            | 3.5   | 16.2              |

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

a "Net Total" is government-wide total less intragovernmental transactions.

b "National Defense" includes the military budget of DoD and other defense-related activities. Beginning in 1985, the Federal Budget reflects establishment of a military retirement trust fund. Data for prior years adjusted for comparable treatment of military retired pay.

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

E Estimate.

r Revised.

Tr. Qtr. See Glossary.



**FEDERAL OUTLAYS**  
**DEFENSE, NASA, AND AEROSPACE PRODUCTS & SERVICES**  
 Fiscal Years 1968–1996  
 (Millions of Dollars)

| Year              | TOTAL<br>National<br>Defense | TOTAL<br>NASA       | Federal Outlays<br>for Aerospace<br>Products & Services |                  |          | Aero-<br>space as<br>Percent<br>of Total<br>National<br>Defense<br>and NASA |
|-------------------|------------------------------|---------------------|---|------------------|----------|---|
|                   |                              |                     | TOTAL   | DoD <sup>a</sup> | NASA     |   |
| 1968              | \$ 81,926                    | \$ 4,724            | \$16,279  | \$11,681         | \$ 4,598 | 18.8 %  |
| 1969              | 82,497                       | 4,252               | 15,872  | 11,686           | 4,186    | 18.3  |
| 1970              | 81,692                       | 3,753               | 14,559  | 10,860           | 3,699    | 17.0  |
| 1971              | 78,872                       | 3,382               | 12,918  | 9,580            | 3,338    | 15.7  |
| 1972              | 79,174                       | 3,423               | 12,309  | 8,936            | 3,373    | 14.9  |
| 1973              | 76,681                       | 3,315               | 11,360  | 8,089            | 3,271    | 14.2  |
| 1974              | 79,347                       | 3,256               | 11,168  | 7,987            | 3,181    | 13.5  |
| 1975              | 86,509                       | 3,267               | 11,544  | 8,373            | 3,181    | 12.9  |
| 1976              | 89,619                       | 3,669               | 12,364  | 8,816            | 3,548    | 13.3  |
| Tr. Qtr.          | 22,269                       | 951                 | 2,855   | 1,959            | 926      | 12.3  |
| 1977              | 97,241                       | 3,945               | 13,229  | 9,389            | 3,840    | 13.1  |
| 1978              | 104,495                      | 3,983               | 13,926  | 10,067           | 3,859    | 12.8  |
| 1979              | 116,342                      | 4,197               | 16,686  | 12,622           | 4,064    | 13.8  |
| 1980              | 133,995                      | 4,852               | 20,269  | 15,558           | 4,711    | 14.6  |
| 1981              | 157,513                      | 5,421               | 24,276  | 19,002           | 5,274    | 14.9  |
| 1982              | 185,309                      | 6,035               | 29,501  | 23,575           | 5,926    | 15.4  |
| 1983              | 209,903                      | 6,664               | 35,364  | 28,808           | 6,556    | 16.3  |
| 1984              | 227,413                      | 7,048               | 39,663  | 32,723           | 6,940    | 16.9  |
| 1985              | 252,748                      | 7,318               | 44,483  | 37,335           | 7,148    | 17.1  |
| 1986              | 273,375                      | 7,404               | 49,773  | 42,558           | 7,215    | 17.7  |
| 1987              | 281,999                      | 7,591               | 51,871  | 44,429           | 7,442    | 17.9  |
| 1988              | 290,361                      | 9,092               | 48,848  | 39,922           | 8,926    | 16.3  |
| 1989              | 303,559                      | 11,036 <sup>r</sup> | 52,933  | 42,072           | 10,861   | 16.8  |
| 1990              | 299,331                      | 12,429              | 53,194  | 40,992           | 12,202   | 17.1  |
| 1991 <sup>b</sup> | 273,292                      | 13,878              | 53,630  | 40,089           | 13,541   | 18.7  |
| 1992 <sup>b</sup> | 298,350                      | 13,961              | 50,569  | 37,085           | 13,484   | 16.2  |
| 1993 <sup>b</sup> | 291,086                      | 14,305 <sup>r</sup> | 45,496  | 31,763           | 13,733   | 14.9  |
| 1994              | 281,563                      | 13,695              | 41,082  | 27,774           | 13,308   | 13.9  |
| 1995 <sup>E</sup> | 271,600                      | 14,241              | 38,009  | 24,321           | 13,688   | 13.3  |
| 1996 <sup>E</sup> | 261,424                      | 14,127              | 35,544  | 21,579           | 13,965   | 12.9  |

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

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

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

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

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

r Revised.

Tr. Qtr. See Glossary.

## FEDERAL OUTLAYS FOR AEROSPACE PRODUCTS AND SERVICES

Fiscal Years 1967–1996

(Millions of Dollars)

| Year              | TOTAL    | Department of Defense <sup>a</sup> |          |                     | NASA <sup>b</sup> |
|-------------------|----------|------------------------------------|----------|---------------------|-------------------|
|                   |          | TOTAL                              | Aircraft | Missiles            |                   |
| 1967              | \$15,478 | \$10,341                           | \$ 8,411 | \$ 1,930            | \$ 5,137          |
| 1968              | 16,279   | 11,681                             | 9,462    | 2,219               | 4,598             |
| 1969              | 15,872   | 11,686                             | 9,177    | 2,509               | 4,186             |
| 1970              | 14,559   | 10,860                             | 7,948    | 2,912               | 3,699             |
| 1971              | 12,918   | 9,580                              | 6,549    | 3,031               | 3,338             |
| 1972              | 12,309   | 8,936                              | 5,927    | 3,009               | 3,373             |
| 1973              | 11,360   | 8,089                              | 5,066    | 3,023               | 3,271             |
| 1974              | 11,168   | 7,987                              | 5,006    | 2,981               | 3,181             |
| 1975              | 11,554   | 8,373                              | 5,484    | 2,889               | 3,181             |
| 1976              | 12,364   | 8,816                              | 6,520    | 2,296               | 3,548             |
| Tr. Qtr.          | 2,885    | 1,959                              | 1,557    | 402                 | 926               |
| 1977              | 13,229   | 9,389                              | 6,608    | 2,781               | 3,840             |
| 1978              | 13,926   | 10,067                             | 6,971    | 3,096               | 3,859             |
| 1979              | 16,686   | 12,622                             | 8,836    | 3,786               | 4,064             |
| 1980              | 20,269   | 15,558                             | 11,124   | 4,434               | 4,711             |
| 1981              | 24,276   | 19,002                             | 13,193   | 5,809               | 5,274             |
| 1982              | 29,501   | 23,575                             | 16,793   | 6,782               | 5,926             |
| 1983              | 35,364   | 28,808                             | 21,013   | 7,795               | 6,556             |
| 1984              | 39,663   | 32,723                             | 23,196   | 9,527               | 6,940             |
| 1985              | 44,483   | 37,335                             | 26,586   | 10,749              | 7,148             |
| 1986              | 49,773   | 42,558                             | 30,828   | 11,730              | 7,215             |
| 1987              | 51,871   | 44,429                             | 32,956   | 11,473 <sup>c</sup> | 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 <sup>E</sup> | 38,009   | 24,321                             | 16,249   | 8,072               | 13,688            |
| 1996 <sup>E</sup> | 35,544   | 21,579                             | 14,544   | 7,035               | 13,965            |

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

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

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

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

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

Tr. Qtr See Glossary

**DEPARTMENT OF DEFENSE**  
**TOTAL MILITARY OUTLAYS BY FUNCTIONAL TITLE<sup>a</sup>**

Fiscal Years 1987–1996  
(Millions of Dollars)

|                                       | 1987      | 1988      | 1989      | 1990      |
|---------------------------------------|-----------|-----------|-----------|-----------|
| <b>TOTAL</b> .....                    | \$273,966 | \$281,935 | \$294,880 | \$289,755 |
| <b>Procurement—TOTAL</b> .....        | \$ 80,744 | \$ 77,166 | \$ 81,620 | \$ 80,972 |
| Aircraft .....                        | 32,956    | 28,246    | 27,569    | 26,142    |
| Missiles <sup>b</sup> .....           | 11,473    | 11,676    | 14,503    | 14,851    |
| Ships .....                           | 9,316     | 8,878     | 10,587    | 11,016    |
| Weapons <sup>b</sup> .....            | 4,962     | 4,727     | 4,384     | 3,873     |
| Ammunition .....                      | 2,111     | 2,250     | 1,993     | 2,003     |
| Other <sup>c</sup> .....              | 19,926    | 21,389    | 22,585    | 23,088    |
| <b>Military Personnel—TOTAL</b> ..... | 72,020    | 76,337    | 80,676    | 75,622    |
| Active Forces .....                   | 63,810    | 67,642    | 71,571    | 66,541    |
| Reserve Forces .....                  | 8,210     | 8,694     | 9,104     | 9,081     |
| RDT&E .....                           | 33,596    | 34,792    | 37,002    | 37,458    |
| Operations & Maintenance .....        | 76,205    | 84,475    | 87,001    | 88,340    |
| Military Construction .....           | 5,853     | 5,874     | 5,275     | 5,080     |
| Family Housing .....                  | 2,908     | 3,082     | 3,257     | 3,501     |
| Other <sup>d</sup> .....              | 2,640     | 210       | 50        | (1,218)   |

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

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

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

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

c Includes Communications and Electronics.

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

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

f Revised.

**DEPARTMENT OF DEFENSE**  
**TOTAL MILITARY OUTLAYS BY FUNCTIONAL TITLE<sup>a</sup> (Continued)**  
**Fiscal Years 1987–1996**  
**(Millions of Dollars)**

| 1991                   | 1992                    | 1993                   | 1994             | 1995 <sup>E</sup> | 1996 <sup>E</sup> |
|------------------------|-------------------------|------------------------|------------------|-------------------|-------------------|
| \$262,389 <sup>d</sup> | \$286,892 <sup>dr</sup> | \$278,561 <sup>d</sup> | \$268,611        | \$260,155         | \$249,978         |
| <u>\$ 82,028</u>       | <u>\$ 74,881</u>        | <u>\$ 69,936</u>       | <u>\$ 61,758</u> | <u>\$ 54,671</u>  | <u>\$ 48,630</u>  |
| 25,689                 | 23,581                  | 20,359                 | 18,840           | 16,249            | 14,544            |
| 14,400                 | 13,504                  | 11,404                 | 8,934            | 8,072             | 7,035             |
| 11,512                 | 11,035                  | 10,136                 | 9,132            | 8,094             | 7,296             |
| 3,716                  | 3,324                   | 3,061                  | 1,795            | 1,792             | 1,668             |
| 2,103                  | 1,996                   | 1,383                  | 997              | 1,451             | 1,129             |
| 24,609                 | 21,442                  | 23,593                 | 22,061           | 19,011            | 16,958            |
| <u>83,439</u>          | <u>81,171</u>           | <u>75,904</u>          | <u>73,137</u>    | <u>70,750</u>     | <u>66,182</u>     |
| 74,571                 | 71,433                  | 66,494                 | 63,686           | 61,511            | 57,207            |
| 8,868                  | 9,738                   | 9,410                  | 9,449            | 9,240             | 8,975             |
| 34,589                 | 34,632                  | 36,968                 | 34,762           | 34,981            | 34,476            |
| 101,769                | 91,984                  | 94,094                 | 87,880           | 90,129            | 91,452            |
| 3,497                  | 4,262                   | 4,831                  | 4,979            | 5,621             | 5,664             |
| 3,296                  | 3,271                   | 3,255                  | 3,316            | 3,457             | 3,924             |
| (46,229) <sup>d</sup>  | (3,308) <sup>d</sup>    | (6,428) <sup>d</sup>   | 2,779            | 547               | (354)             |

**FEDERAL PRICE DEFLATORS FOR GDP, DEFENSE, PPI, AND CPI  
(1965-1996)**

| Year              | GDP                 |                    | Federal Government<br>Defense Purchases |                     | PPI,<br>Capital<br>Equip-<br>ment | CPI,<br>(Urban)<br>All<br>items |
|-------------------|---------------------|--------------------|---|---------------------|-----------------------------------|---------------------------------|
|                   | FY GDP              | CY GDP             | Durable<br>Goods                        | Goods &<br>Services |                                   |                                 |
|                   | (FY 1987<br>=100)   | (CY 1987<br>=100)  | (CY 1987<br>=100)                       | (CY 1987<br>=100)   | (CY 1982<br>=100)                 | (CY 82-84<br>=100)              |
| 1965              | 28.27               | 28.4               | NA                                      | NA                  | 33.8                              | 31.5                            |
| 1966              | 29.07               | 29.4               | NA                                      | NA                  | 34.6                              | 32.4                            |
| 1967              | 30.06               | 30.3               | NA                                      | NA                  | 35.8                              | 33.4                            |
| 1968              | 31.20               | 31.8               | NA                                      | NA                  | 37.0                              | 34.8                            |
| 1969              | 32.79               | 33.4               | NA                                      | NA                  | 38.3                              | 36.7                            |
| 1970              | 34.57               | 35.2               | NA                                      | NA                  | 40.1                              | 38.8                            |
| 1971              | 36.34               | 37.1               | NA                                      | NA                  | 41.7                              | 40.5                            |
| 1972              | 38.23               | 38.8               | 38.8                                    | 36.9                | 42.8                              | 41.8                            |
| 1973              | 40.22               | 41.3               | 41.8                                    | 40.5                | 44.2                              | 44.4                            |
| 1974              | 43.27               | 44.9               | 44.3                                    | 44.5                | 50.5                              | 49.3                            |
| 1975              | 47.58               | 49.2               | 47.1                                    | 48.5                | 58.2                              | 53.8                            |
| 1976              | 51.22               | 52.3               | 51.7                                    | 51.9                | 62.1                              | 56.9                            |
| 1977              | 55.38               | 55.9               | 55.5                                    | 55.6                | 66.1                              | 60.6                            |
| 1978              | 59.57               | 60.3               | 60.4                                    | 59.8                | 71.3                              | 65.2                            |
| 1979              | 64.74               | 65.5               | 67.7                                    | 65.8                | 77.5                              | 72.6                            |
| 1980              | 70.58               | 71.7               | 72.6                                    | 73.5                | 85.8                              | 82.4                            |
| 1981              | 77.76               | 78.9               | 82.0                                    | 81.1                | 94.6                              | 90.9                            |
| 1982              | 83.55               | 83.8               | 92.1                                    | 87.6                | 100.0                             | 96.5                            |
| 1983              | 87.02               | 87.2               | 98.4                                    | 91.6                | 102.8                             | 99.6                            |
| 1984              | 90.85               | 91.0               | 102.3                                   | 94.8                | 105.2                             | 103.9                           |
| 1985              | 94.32               | 94.4               | 103.0                                   | 97.3                | 107.5                             | 107.6                           |
| 1986              | 97.12               | 96.9               | 103.9                                   | 98.6                | 109.7                             | 109.6                           |
| 1987              | 100.00              | 100.0              | 100.0                                   | 100.0               | 111.7                             | 113.6                           |
| 1988              | 103.63              | 103.9              | 101.2                                   | 103.0               | 114.3                             | 118.3                           |
| 1989              | 108.23              | 108.5              | 103.0                                   | 106.6               | 118.8                             | 124.0                           |
| 1990              | 112.00              | 113.3              | 104.6                                   | 110.7               | 122.9                             | 130.7                           |
| 1991              | 116.70 <sup>r</sup> | 117.6 <sup>r</sup> | 106.9                                   | 114.7               | 126.7                             | 136.2                           |
| 1992              | 120.10 <sup>r</sup> | 120.9 <sup>r</sup> | 107.9                                   | 120.2 <sup>r</sup>  | 129.1                             | 140.3                           |
| 1993              | 123.00 <sup>r</sup> | 123.5 <sup>r</sup> | 110.9                                   | 124.2 <sup>r</sup>  | 131.4                             | 144.5                           |
| 1994              | 125.40              | 126.2              | 111.7                                   | 128.9               | 134.1                             | 148.3                           |
| 1995 <sup>E</sup> | 128.80              | 129.7              | NA                                      | NA                  | NA                                | 152.9                           |
| 1996 <sup>E</sup> | 132.60              | 133.5              | NA                                      | NA                  | NA                                | 157.8                           |

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

E Estimate.

NA Not Available.

r Revised.

Key: PPI = Producer Price Index for Capital Equipment.

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

GDP = Gross Domestic Product.



**PRICE DEFLATORS FOR AEROSPACE INDUSTRY**  
**Calendar Years 1972–1994**

| Year              | Aerospace Deflators (1987 = 100) |             |             |             |             |               |
|-------------------|----------------------------------|-------------|-------------|-------------|-------------|---------------|
|                   | Composite                        | SIC<br>3721 | SIC<br>3724 | SIC<br>3728 | SIC<br>3761 | SIC<br>3764,9 |
| 1972              | 33.7                             | 39.9        | 30.1        | 36.6        | 39.7        | 34.4          |
| 1973              | 37.7                             | 41.2        | 30.9        | 38.1        | 39.4        | 35.6          |
| 1974              | 41.5                             | 44.8        | 34.9        | 44.0        | 41.6        | 40.5          |
| 1975              | 46.6                             | 48.3        | 42.3        | 51.6        | 45.2        | 49.2          |
| 1976              | 51.0                             | 52.8        | 45.9        | 56.5        | 50.4        | 53.8          |
| 1977              | 54.6                             | 56.2        | 49.1        | 58.7        | 55.6        | 58.2          |
| 1978              | 57.5                             | 59.3        | 54.6        | 55.2        | 60.7        | 63.6          |
| 1979              | 63.5                             | 65.3        | 60.9        | 58.9        | 69.7        | 70.0          |
| 1980              | 70.6                             | 72.9        | 66.3        | 65.3        | 78.9        | 78.5          |
| 1981              | 79.5                             | 80.8        | 77.0        | 74.9        | 87.1        | 89.5          |
| 1982              | 87.9                             | 89.8        | 85.2        | 84.3        | 93.4        | 97.2          |
| 1983              | 92.2                             | 94.4        | 89.5        | 87.9        | 98.6        | 101.5         |
| 1984              | 99.8                             | 105.9       | 98.1        | 93.6        | 100.7       | 102.9         |
| 1985 <sup>a</sup> | 98.7                             | 100.7       | 99.2        | 94.4        | 102.4       | 103.2         |
| 1986              | 99.8                             | 100.6       | 99.3        | 97.9        | 103.5       | 102.4         |
| 1987              | 100.0                            | 100.0       | 100.0       | 100.0       | 100.0       | 100.0         |
| 1988              | 101.9                            | 102.2       | 103.0       | 103.5       | 95.0        | 100.3         |
| 1989              | 106.1                            | 111.0       | 105.8       | 106.8       | 91.4        | 100.6         |
| 1990              | 110.5                            | 116.8       | 111.7       | 109.8       | 91.5        | 98.1          |
| 1991              | 114.6                            | 121.3       | 117.0       | 113.6       | 94.4        | 94.6          |
| 1992              | 117.4                            | 125.2       | 122.7       | 118.0       | 93.1        | 83.5          |
| 1993              | 120.8                            | 129.5       | 124.7       | 120.9       | 84.6        | 89.7          |
| 1994              | 122.3                            | 133.9       | 128.0       | 123.5       | 85.7        | 89.6          |

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

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

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

# Aircraft Production

**S**ales of aircraft, engines, and parts, generally the largest single component of the aerospace industry's overall sales volume, continued their downward slide in 1994 despite an enormous increase in military sales.

According to data supplied by the Bureau of the Census, total sales of aircraft, engines, and parts amounted to \$51 billion, down from \$56.4 billion in 1993. The rate of decline, however, was substantially softer: 10 percent in 1994, compared with almost 17 percent in the previous year.

Sales of military aircraft, engines, and parts increased for the first time since 1990, from \$15.4 billion in 1993 to \$20.4 billion in 1994. Commercial aircraft, engines, and parts sales, however, experienced a precipitous decline, a 25 percent drop from 1993's \$41 billion to \$30.6 billion in 1994. The decline was the second in a row after eight consecutive years of increase. These figures differ from AIA estimates (\$32.1 billion military, \$26 billion civil) in that the AIA data includes aircraft-related Research, Development, Test, and Evaluation (RDT&E) outlays and excludes civilian maintenance, modification, and conversion work.

Census' figures on net new orders in 1994 offered some opti-

mism for the near future as orders increased in both the military and non-military areas to a grand total of \$42.1 billion, up from \$31.1 billion in 1993. Orders for military aircraft, engines, and parts amounted to \$22.6 billion, up from \$15 billion in the previous year. Non-military orders totaled \$19.5 billion, up from \$16.1 billion.

The backlog of orders for aircraft, engines, and parts once again fell off sharply, after a very sharp decline in 1993 and a three percent drop in 1992. Total backlog reported by Census was \$120.7 billion, down from \$133 billion in 1993 and down by \$53 billion (31 percent) from the



---

all-time peak of 1991. Orders for non-military (commercial) equipment represented 70 percent of the total; at \$84.6 billion, the commercial backlog was down 12 percent below the prior year's \$96.2 billion. The military backlog declined slightly from \$36.7 billion to \$36.1 billion.

AIA data shows that commercial transport manufacture accounted for \$18.1 billion, or 88 percent, of the \$20.7 billion value of 1994's civil aircraft shipments. The industry built 309 transports, roughly 100 fewer than in 1993 and the lowest number produced since 1985. Almost three-quarters of the transport production (222 planes) represented export shipments.

Overall, the industry produced 1,545 civil aircraft, including 928 general aviation planes and 308 helicopters. General aviation shipments included 543 units delivered to domestic customers and 385 exported. The value of general aviation sales was \$2.4 billion, up 10 percent from 1993's \$2.1 billion and the highest value recorded since 1981.

Civil helicopter production was up both numerically and in dollar value over the previous year. In 1994, the industry produced 308 helicopters worth \$185 million; the comparable numbers for 1993 were 258 units valued at \$113 million. Deliv-

eries of helicopters were split evenly between domestic and foreign customers.



## SALES OF AIRCRAFT, ENGINES, AND PARTS

Calendar Years 1980–1994

(Millions of Dollars)

| Year                                | GRAND TOTAL | TOTAL    |          | Complete Aircraft & Parts |          | Aircraft Engines & Parts |          |
|-------------------------------------|-------------|----------|----------|---------------------------|----------|--------------------------|----------|
|                                     |             | Military | Non-Mil. | Military                  | Non-Mil. | Military                 | Non-Mil. |
| <b>CURRENT DOLLARS</b>              |             |          |          |                           |          |                          |          |
| 1980                                | \$29,524    | \$10,963 | \$18,561 | \$ 8,260                  | \$14,365 | \$2,703                  | \$ 4,196 |
| 1981                                | 33,574      | 14,575   | 18,999   | 10,725                    | 14,349   | 3,850                    | 4,650    |
| 1982                                | 31,886      | 17,743   | 14,143   | 13,541                    | 9,678    | 4,202                    | 4,465    |
| 1983                                | 35,879      | 19,809   | 16,070   | 15,651                    | 11,666   | 4,158                    | 4,404    |
| 1984                                | 37,285      | 23,268   | 14,017   | 18,218                    | 10,039   | 5,050                    | 3,978    |
| 1985                                | 43,940      | 25,758   | 18,182   | 21,642                    | 12,607   | 4,116                    | 5,575    |
| 1986                                | 47,757      | 27,043   | 20,714   | 23,089                    | 14,876   | 3,954                    | 5,838    |
| 1987                                | 49,062      | 27,806   | 21,256   | 22,168                    | 14,862   | 5,638                    | 6,394    |
| 1988                                | 50,742      | 25,068   | 25,674   | 19,030                    | 16,681   | 6,038                    | 8,993    |
| 1989                                | 53,825      | 24,287   | 29,538   | 18,256                    | 20,140   | 6,031                    | 9,398    |
| 1990                                | 66,289      | 27,667   | 38,622   | 22,023                    | 27,872   | 5,644                    | 10,750   |
| 1991                                | 68,540      | 25,385   | 43,155   | 19,710                    | 33,215   | 5,675                    | 9,940    |
| 1992                                | 67,669      | 23,509   | 44,160   | 18,411                    | 35,595   | 5,098                    | 8,565    |
| 1993 <sup>r</sup>                   | 56,389      | 15,374   | 41,015   | 11,394                    | 32,809   | 3,980                    | 8,206    |
| 1994                                | 51,018      | 20,400   | 30,618   | 17,087                    | 23,088   | 3,313                    | 7,530    |
| <b>CONSTANT DOLLARS<sup>a</sup></b> |             |          |          |                           |          |                          |          |
| 1980                                | \$41,819    | \$15,528 | \$26,290 | \$11,700                  | \$20,347 | \$3,829                  | \$ 5,943 |
| 1981                                | 42,231      | 18,333   | 23,898   | 13,491                    | 18,049   | 4,843                    | 5,849    |
| 1982                                | 36,275      | 20,185   | 16,090   | 15,405                    | 11,010   | 4,780                    | 5,080    |
| 1983                                | 38,914      | 21,485   | 17,430   | 16,975                    | 12,653   | 4,510                    | 4,777    |
| 1984                                | 37,360      | 23,315   | 14,045   | 18,255                    | 10,059   | 5,060                    | 3,986    |
| 1985                                | 44,519      | 26,097   | 18,421   | 21,927                    | 12,773   | 4,170                    | 5,648    |
| 1986                                | 47,853      | 27,097   | 20,756   | 23,135                    | 14,906   | 3,962                    | 5,850    |
| 1987                                | 49,062      | 27,806   | 21,256   | 22,168                    | 14,862   | 5,638                    | 6,394    |
| 1988                                | 49,796      | 24,601   | 25,195   | 18,675                    | 16,370   | 5,925                    | 8,825    |
| 1989                                | 50,730      | 22,891   | 27,840   | 17,206                    | 18,982   | 5,684                    | 8,858    |
| 1990                                | 59,990      | 25,038   | 34,952   | 19,930                    | 25,224   | 5,108                    | 9,729    |
| 1991                                | 59,808      | 22,151   | 37,657   | 17,199                    | 28,983   | 4,952                    | 8,674    |
| 1992                                | 57,640      | 20,025   | 37,615   | 15,682                    | 30,319   | 4,342                    | 7,296    |
| 1993 <sup>r</sup>                   | 46,680      | 12,727   | 33,953   | 9,432                     | 27,160   | 3,295                    | 6,793    |
| 1994                                | 41,715      | 16,680   | 25,035   | 13,971                    | 18,878   | 2,709                    | 6,157    |

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

Note: The detail necessary to report orders, sales, and backlog by customer (ie U.S. Gov't vs Other) has been withheld by the Census Bureau. Consequently, this table has been recomputed showing orders, sales, and backlog by application (ie Military vs Non-Military).

<sup>a</sup> Based on AIA's aerospace composite price deflator, 1987=100.<sup>r</sup> Revised.

## ORDERS AND BACKLOG OF AIRCRAFT, ENGINES, AND PARTS

Calendar Years 1980–1994  
(Millions of Current Dollars)

| Year                             | GRAND TOTAL            | TOTAL    |           | Complete Aircraft & Parts |           | Aircraft Engines & Parts |          |
|----------------------------------|------------------------|----------|-----------|---------------------------|-----------|--------------------------|----------|
|                                  |                        | Military | Non-Mil.  | Military                  | Non-Mil.  | Military                 | Non-Mil. |
| <b>NET NEW ORDERS</b>            |                        |          |           |                           |           |                          |          |
| 1980                             | \$ 34,345 <sup>r</sup> | \$15,208 | \$ 19,137 | \$11,512                  | \$ 14,188 | \$3,696                  | \$ 4,949 |
| 1981                             | 34,436 <sup>r</sup>    | 19,228   | 15,208    | 14,042                    | 9,918     | 5,186                    | 5,290    |
| 1982                             | 33,775 <sup>r</sup>    | 24,186   | 9,589     | 19,632                    | 6,523     | 4,554                    | 3,066    |
| 1983                             | 33,599                 | 26,231   | 12,368    | 21,494                    | 7,596     | 4,737                    | 4,772    |
| 1984                             | 47,102                 | 29,894   | 17,208    | 23,312                    | 14,064    | 6,582                    | 3,144    |
| 1985                             | 49,942                 | 28,201   | 21,741    | 24,526                    | 15,689    | 3,675                    | 6,052    |
| 1986                             | 47,957                 | 24,124   | 23,833    | 19,852                    | 17,592    | 4,272                    | 6,241    |
| 1987                             | 52,347                 | 19,347   | 33,000    | 15,070                    | 24,083    | 4,277                    | 8,917    |
| 1988                             | 82,148                 | 24,242   | 57,906    | 17,493                    | 41,762    | 6,749                    | 16,144   |
| 1989                             | 96,591                 | 28,818   | 67,773    | 23,569                    | 52,619    | 5,249                    | 15,154   |
| 1990                             | 82,386                 | 17,735   | 64,651    | 12,766                    | 52,371    | 4,969                    | 12,280   |
| 1991                             | 67,490                 | 26,675   | 40,815    | 22,140                    | 30,745    | 4,535                    | 10,070   |
| 1992                             | 49,741                 | 19,631   | 30,110    | 16,391                    | 20,548    | 3,240                    | 9,562    |
| 1993                             | 31,108 <sup>r</sup>    | 15,023   | 16,085    | 11,358                    | 11,233    | 3,665                    | 4,852    |
| 1994                             | 42,078                 | 22,628   | 19,450    | 19,150                    | 12,834    | 3,478                    | 6,616    |
| <b>BACKLOG AS OF DECEMBER 31</b> |                        |          |           |                           |           |                          |          |
| 1980                             | \$ 56,637 <sup>r</sup> | \$23,472 | \$ 33,165 | \$18,739                  | \$ 26,623 | \$4,733                  | \$ 6,542 |
| 1981                             | 55,912 <sup>r</sup>    | 26,867   | 29,045    | 21,201                    | 21,706    | 5,666                    | 7,339    |
| 1982                             | 58,154 <sup>r</sup>    | 33,309   | 24,845    | 27,291                    | 18,905    | 6,018                    | 5,940    |
| 1983                             | 60,372                 | 38,824   | 21,548    | 32,227                    | 15,241    | 6,597                    | 6,307    |
| 1984                             | 70,189                 | 45,450   | 24,739    | 37,321                    | 19,266    | 8,129                    | 5,473    |
| 1985                             | 76,191                 | 47,893   | 28,298    | 40,205                    | 22,348    | 7,688                    | 5,950    |
| 1986                             | 76,391                 | 44,974   | 31,417    | 36,968                    | 25,064    | 8,006                    | 6,353    |
| 1987                             | 80,015                 | 36,514   | 43,501    | 29,869                    | 34,625    | 6,645                    | 8,876    |
| 1988                             | 111,280                | 35,515   | 75,765    | 28,186                    | 59,679    | 7,329                    | 16,086   |
| 1989                             | 159,150                | 44,026   | 115,124   | 36,888                    | 95,108    | 7,138                    | 20,016   |
| 1990                             | 172,940                | 33,788   | 139,152   | 27,259                    | 119,123   | 6,529                    | 20,029   |
| 1991                             | 173,676                | 39,149   | 134,527   | 32,795                    | 116,139   | 6,354                    | 18,388   |
| 1992                             | 168,577                | 44,255   | 124,322   | 39,748                    | 107,686   | 4,507                    | 16,636   |
| 1993                             | 132,950 <sup>r</sup>   | 36,725   | 96,225    | 32,280                    | 82,770    | 4,445                    | 13,455   |
| 1994                             | 120,694                | 36,090   | 84,604    | 31,959                    | 72,264    | 4,131                    | 12,340   |

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

Note: The detail necessary to report orders, sales, and backlog by customer (ie U.S. Gov't vs Other) has been withheld by the Census Bureau. Consequently, this table has been recomputed showing orders, sales, and backlog by application (ie Military vs Non-military).

<sup>r</sup> Revised

**U.S. AIRCRAFT PRODUCTION—CIVIL**  
**Calendar Years 1969–1994**

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

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

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

**U.S. AIRCRAFT PRODUCTION—MILITARY**  
Calendar Years 1969–1994

| Year              | TOTAL            | U.S. Military Agencies | Exports |                  |                     |
|-------------------|------------------|------------------------|---------|------------------|---------------------|
|                   |                  |                        | Total   | FMS <sup>a</sup> | Direct <sup>b</sup> |
| 1969              | 4,290            | 3,644                  | 646     | NA               | NA                  |
| 1970              | 3,720            | 3,085                  | 635     | NA               | NA                  |
| 1971              | 2,914            | 2,232                  | 682     | NA               | NA                  |
| 1972              | 2,530            | 1,993                  | 537     | 124              | 413                 |
| 1973              | 1,821            | 1,243                  | 578     | 129              | 449                 |
| 1974              | 1,513            | 799                    | 714     | 365              | 349                 |
| 1975              | 1,779            | 844                    | 935     | 525              | 410                 |
| 1976              | 1,318            | 625                    | 693     | 518              | 175                 |
| 1977              | 1,134            | 454                    | 680     | 408              | 272                 |
| 1978              | 996              | 467                    | 529     | 256              | 273                 |
| 1979              | 837              | 531                    | 306     | 203              | 103                 |
| 1980              | 1,047            | 625                    | 422     | 194              | 228                 |
| 1981              | 1,062            | 703                    | 359     | 215              | 144                 |
| 1982              | 1,159            | 690                    | 469     | 68               | 401                 |
| 1983              | 1,053            | 766                    | 287     | 70               | 217                 |
| 1984              | 936              | 561                    | 375     | 71               | 304                 |
| 1985              | 919              | 643                    | 276     | 134              | 142                 |
| 1986              | 1,107            | 708                    | 399     | 110              | 289                 |
| 1987              | 1,210            | 725                    | 485     | 133              | 352                 |
| 1988              | 1,305            | 687                    | 618     | 138              | 480                 |
| 1989              | 1,261            | 614                    | 647     | 92               | 555                 |
| 1990              | 1,053            | 664                    | 387     | 99               | 290                 |
| 1991              | 911              | 556                    | 355     | 94               | 261                 |
| 1992              | 753              | 422                    | 331     | 122              | 209                 |
| 1993 <sup>r</sup> | 955 <sup>c</sup> | 437                    | 518     | 146              | 372 <sup>c</sup>    |
| 1994              | 755              | 409                    | 346     | 63               | 283                 |

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

a Also includes acceptances of NATO AWACS aircraft.

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

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

NA Not available.

r Revised.

**CIVIL AIRCRAFT SHIPMENTS**

Calendar Years 1980–1994

| Year                              | TOTAL    | Transport Aircraft <sup>a</sup> | Helicopters | General Aviation   |
|-----------------------------------|----------|---------------------------------|-------------|--------------------|
| <b>NUMBER OF AIRCRAFT SHIPPED</b> |          |                                 |             |                    |
| 1980                              | 13,634   | 387                             | 1,366       | 11,881             |
| 1981                              | 10,916   | 387                             | 1,072       | 9,457              |
| 1982                              | 5,085    | 232                             | 587         | 4,266              |
| 1983                              | 3,356    | 262                             | 403         | 2,691 <sup>b</sup> |
| 1984                              | 2,999    | 185                             | 376         | 2,438              |
| 1985                              | 2,691    | 278                             | 384         | 2,029              |
| 1986                              | 2,155    | 330                             | 330         | 1,495              |
| 1987                              | 1,800    | 357                             | 358         | 1,085              |
| 1988                              | 1,949    | 423                             | 383         | 1,143              |
| 1989                              | 2,448    | 398                             | 515         | 1,535              |
| 1990                              | 2,268    | 521                             | 603         | 1,144              |
| 1991                              | 2,181    | 589                             | 571         | 1,021              |
| 1992                              | 1,790    | 567                             | 324         | 899                |
| 1993                              | 1,630    | 408                             | 258         | 964                |
| 1994                              | 1,545    | 309                             | 308         | 928                |
| <b>VALUE—Millions of Dollars</b>  |          |                                 |             |                    |
| 1980                              | \$13,058 | \$ 9,895                        | \$656       | \$2,507            |
| 1981                              | 13,223   | 9,706                           | 597         | 2,920              |
| 1982                              | 8,610    | 6,246                           | 365         | 1,999              |
| 1983                              | 9,773    | 8,000                           | 303         | 1,470 <sup>b</sup> |
| 1984                              | 7,717    | 5,689                           | 330         | 1,698              |
| 1985                              | 10,385   | 8,448                           | 506         | 1,431              |
| 1986                              | 11,858   | 10,308                          | 288         | 1,262              |
| 1987                              | 12,148   | 10,507                          | 277         | 1,364              |
| 1988                              | 15,855   | 13,603                          | 334         | 1,918              |
| 1989                              | 17,129   | 15,074                          | 251         | 1,804              |
| 1990                              | 24,477   | 22,215                          | 254         | 2,008              |
| 1991                              | 29,035   | 26,856                          | 211         | 1,968              |
| 1992                              | 30,728   | 28,750                          | 142         | 1,836              |
| 1993                              | 26,389   | 24,133                          | 113         | 2,144              |
| 1994                              | 20,666   | 18,124                          | 185         | 2,357              |

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

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

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



CIVIL TRANSPORT AIRCRAFT BACKLOG<sup>a</sup>

As of December 31, 1990–1994

| Company and Model   | 1990         | 1991         | 1992         | 1993                     | 1994                  |
|---|--------------|--------------|--------------|--------------------------|-----------------------|
| <b>TOTAL AIRCRAFT ON ORDER</b><br>(Domestic and Foreign Orders) | 2,138        | 1,829        | 1,493        | 1,356 <sup>f</sup>       | 1,126                 |
| Value (Millions of Dollars) . . . .                             | \$112,339    | \$108,833    | \$96,724     | \$77,735                 | \$67,709              |
| <b>Boeing—TOTAL</b> . . . . .                                   | <u>1,563</u> | <u>1,456</u> | <u>1,210</u> | <u>1,153<sup>f</sup></u> | <u>959</u>            |
| B-737 . . . . .   | 754          | 615          | 488          | 463 <sup>f</sup>         | 391                   |
| B-747 . . . . .   | 250          | 234          | 214          | 156                      | 111                   |
| B-757 . . . . .   | 333          | 333          | 241          | 246                      | 182                   |
| B-767 . . . . .   | 192          | 188          | 145          | 141                      | 128                   |
| B-777 . . . . .   | 34           | 86           | 122          | 147                      | 147                   |
| <b>McDonnell Douglas—TOTAL</b> . .                              | <u>575</u>   | <u>373</u>   | <u>283</u>   | <u>203</u>               | <u>167</u>            |
| MD-11 . . . . .   | 175          | 138          | 97           | 60                       | 45                    |
| MD-80 . . . . .   | 400          | 235          | 186          | 143                      | 48                    |
| MD-90 . . . . .   | (b)          | (b)          | (b)          | (b)                      | 74                    |
| <b>TOTAL FOREIGN ORDERS</b> . . .                               | 1,205        | 1,073        | 884          | 661                      | 539                   |
| Value (Millions of Dollars) . . . .                             | \$ 71,213    | \$ 72,733    | \$66,795     | \$50,409                 | \$42,962 <sup>E</sup> |
| <b>Boeing—TOTAL</b> . . . . .                                   | <u>872</u>   | <u>844</u>   | <u>687</u>   | <u>511</u>               | <u>415</u>            |
| B-737 . . . . .   | 412          | 329          | 228          | 152                      | 132                   |
| B-747 . . . . .   | 211          | 205          | 192          | 143                      | 103                   |
| B-757 . . . . .   | 125          | 144          | 91           | 48                       | 28                    |
| B-767 . . . . .   | 124          | 114          | 88           | 66                       | 50                    |
| B-777 . . . . .   | —            | 52           | 88           | 102                      | 102                   |
| <b>McDonnell Douglas—TOTAL</b> . .                              | <u>333</u>   | <u>229</u>   | <u>197</u>   | <u>150</u>               | <u>124</u>            |
| MD-11 . . . . .   | 131          | 101          | 76           | 56                       | 39                    |
| MD-80 . . . . .   | 202          | 128          | 121          | 94                       | 42                    |
| MD-90 . . . . .   | (b)          | (b)          | (b)          | (b)                      | 43                    |

Source: Aerospace Industries Association, based on company reports.

NOTE: Boeing's unfilled orders not reported on a firm order basis beginning with 1993.

a Unfilled firm orders excluding options for U.S.-manufactured transport aircraft over 33,000 pounds. Includes new transports

contracted for lease from the manufacturer.

b Not separately reported. Combined with MD-80.

E Estimate.

**SHIPMENTS OF CIVIL TRANSPORT AIRCRAFT<sup>a</sup>**  
**Calendar Years 1990–1994**

| <b>Company and Model</b>            | <b>1990</b> | <b>1991</b> | <b>1992</b> | <b>1993</b> | <b>1994</b> |
|-------------------------------------|-------------|-------------|-------------|-------------|-------------|
| <b>TOTAL</b>                        |             |             |             |             |             |
| Number of Aircraft Shipped . . .    | 521         | 589         | 567         | 408         | 309         |
| Value (Millions of Dollars) . . . . | \$22,215    | \$26,856    | \$28,750    | \$24,133    | \$18,124    |
| <b>Boeing—TOTAL</b> . . . . .       | <u>379</u>  | <u>420</u>  | <u>441</u>  | <u>330</u>  | <u>270</u>  |
| B-737 . . . . .                     | 174         | 214         | 218         | 152         | 121         |
| B-747 . . . . .                     | 68          | 64          | 61          | 56          | 40          |
| B-757 . . . . .                     | 77          | 80          | 99          | 71          | 69          |
| B-767 . . . . .                     | 60          | 62          | 63          | 51          | 40          |
| <b>McDonnell Douglas—TOTAL</b> . .  | <u>142</u>  | <u>169</u>  | <u>126</u>  | <u>78</u>   | <u>39</u>   |
| MD-11 . . . . .                     | 3           | 31          | 42          | 36          | 17          |
| MD-80 . . . . .                     | 139         | 138         | 84          | 42          | 22          |

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

SPECIFICATIONS OF U.S. CIVIL JET TRANSPORT AIRCRAFT<sup>a</sup>

On Order or in Production as of 1994

| Number of Engines and Crew, and Model Designation <sup>b</sup> | Initial Service | Standard Mixed Class | Operating Empty Weight (000's lbs) | Maximum Takeoff Gross Weight (000's lbs) | Range (Nautical Miles) <sup>c</sup> | Engine Manufacturer <sup>d</sup> and Model     |
|--|-----------------|----------------------|------------------------------------|--|-------------------------------------|--|
| <b>FOUR ENGINES/CREW OF 2</b>                                  |                 |                      |                                    |  |                                     |  |
| 747-400*   | 1989            | 380-585              | 400-410                            | 875                                      | 6,060<br>-7,200                     | GE CF6-80C2,<br>P&W PW4056,<br>or RR RB211-524 |
| <b>THREE ENGINES/CREW OF 2</b>                                 |                 |                      |                                    |  |                                     |  |
| MD-11*   | 1989            | 298-410              | 288                                | 625                                      | 6,920                               | GE CF6-80C2-DF1<br>or P&W PW4360               |
| MD-11ER*   | TBD             | 298-410              | 289                                | 630                                      | 7,210                               | GE CF6-80C2-DF1<br>or P&W PW4360               |
| <b>TWO ENGINES/CREW OF 2</b>                                   |                 |                      |                                    |  |                                     |  |
| 737-300  | 1984            | 128-149              | 72-74                              | 125-139                                  | 1,600<br>-2,500                     | CFMI CFM56-3-B1<br>or B2                       |
| 737-400  | 1988            | 146-168              | 76-78                              | 139-150                                  | 2,000<br>-2,500                     | CFMI CFM56-3-B2<br>or CFM56-3C                 |
| 737-500  | 1990            | 108-132              | 70-71                              | 116-134                                  | 1,500<br>-2,800                     | CFMI CFM56-3-B1<br>or CFM56-3C-1               |
| 757  | 1983            | 194-231              | 126                                | 220-255                                  | 3,900                               | RR RB211-535 or<br>P&W PW2000                  |
| 767-200*   | 1982            | 174-285              | 184-188                            | 395                                      | 6,600                               | P&W PW4000 or<br>GE CF6-80C2                   |
| 767-300*   | 1986            | 218                  | 198-202                            | 412                                      | 6,160                               | P&W PW4000,<br>GE CF6-80C2, or<br>RR RB211-524 |
| 777*   | 1995            | 305-440              | 295-320                            | 506-633                                  | 3,960<br>-7,245                     | RR Trent,<br>GE GE90,<br>or P&W PW4000         |
| MD-80 series:  |                 |                      |                                    |  |                                     |  |
| MD-81  | 1980            | 155                  | 80                                 | 142                                      | 1,584                               | P&W JT8D-209 or<br>P&W JT8D-217A               |
| MD-82  | 1981            | 155                  | 80                                 | 149                                      | 2,076                               | P&W JT8D-217C                                  |
| MD-83  | 1985            | 155                  | 81                                 | 160                                      | 2,534                               | P&W JT8D-219                                   |
| MD-87  | 1987            | 130                  | 76                                 | 140                                      | 2,405                               | P&W JT8D-217C                                  |
| MD-88  | 1987            | 155                  | 82                                 | 160                                      | 2,534                               | P&W JT8D-219C or<br>P&W JT8D-217C              |
| MD-90  | 1995            | 155                  | 88                                 | 156                                      | 2,296                               | IAE V2500-D5                                   |

Source: Aerospace Industries Association, based on company reports.

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

b The Boeing Company manufacturers models: 737, 747, 757, 767, &amp; 777 and McDonnell Douglas Corporation manufacturers models: MD-11, MD-80, and MD-90.

c Full passenger load and baggage.

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

TBD: To be decided.

\* Wide-body aircraft.

**SPECIFICATIONS OF U.S. CIVIL HELICOPTERS**  
**In Production as of 1994**

| Company                      | Commercial Model | Number of Places | Useful Load (Lbs.) | Range with Useful Load (N.Miles) | External Cargo Payload (Lbs.) |
|------------------------------|------------------|------------------|--------------------|----------------------------------|-------------------------------|
| Enstrom Helicopter           | F-28 Series      | 3                | 1,030              | 228                              | 1,000                         |
|                              | 280 Series       | 3                | 1,015              | 260                              | 1,000                         |
|                              | 480 Series       | 5                | 1,175              | 415                              | 1,000                         |
| Kaman                        | K-1200           | 1                | NA                 | NA                               | 6,000                         |
| McDonnell Douglas Helicopter | 500 Series       | 5                | 1,519              | 367                              | 2,069                         |
|                              | 520 Series       | 5                | 1,764              | 207                              | 2,364                         |
|                              | 530 Series       | 5                | 1,509              | 232                              | 2,159                         |
|                              | 900 Series       | 8                | 2,565              | NA                               | 3,000                         |
| Robinson Helicopter          | R22              | 2                | 546                | 209                              | —                             |
|                              | R44              | 4                | 1,000              | 210                              | —                             |
| Schweizer Aircraft           | 300C             | 3                | 950                | 201                              | 1,050                         |
|                              | 330              | 4                | 1,110              | 269                              | 1,000                         |
| Sikorsky Aircraft            | S-76B            | 14               | 4,090              | 350                              | 3,300                         |
|                              | S-76C            | 14               | 4,569              | 447                              | 3,300                         |

Source: Helicopter Association International, "1995 Helicopter Annual" (Annually).  
 NA Not available.

**CIVIL HELICOPTER SHIPMENTS<sup>a</sup>**

Calendar Years 1990–1994

| Company and Model                 | 1990       | 1991       | 1992       | 1993           | 1994            |
|-----------------------------------|------------|------------|------------|----------------|-----------------|
| <b>CIVIL SHIPMENTS</b> .....      | 603        | 571        | 324        | 258            | 308             |
| Value (Millions of Dollars) ...   | \$254      | \$211      | \$142      | \$113          | \$185           |
| <b>Bell—TOTAL</b> .....           | <u>16</u>  | <u>4</u>   | <u>1</u>   | <u>2</u>       | <u>—</u>        |
| 212 .....                         | 1          | —          | —          | —              | —               |
| 214 series .....                  | 1          | —          | 1          | 2              | —               |
| 412 .....                         | 14         | 4          | —          | —              | —               |
| <b>Enstrom—TOTAL</b> .....        | <u>27</u>  | <u>17</u>  | <u>6</u>   | <u>10</u>      | <u>17</u>       |
| F-28 series .....                 | 12         | 8          | 3          | (b)            | (b)             |
| 280 series .....                  | 15         | 9          | 3          | 8 <sup>b</sup> | 13 <sup>b</sup> |
| 480 series .....                  | —          | —          | —          | 2              | 4               |
| <b>Kaman—TOTAL</b> .....          | <u>—</u>   | <u>—</u>   | <u>—</u>   | <u>—</u>       | <u>5</u>        |
| K-1200 .....                      | —          | —          | —          | —              | 5               |
| <b>McDonnell Douglas—TOTAL</b> .. | <u>77</u>  | <u>50</u>  | <u>51</u>  | <u>26</u>      | <u>36</u>       |
| 500 series .....                  | 65         | 42         | 23         | 5              | 3               |
| 520N series .....                 | —          | 3          | 17         | 21             | 9               |
| 530 series .....                  | 12         | 5          | 11         | —              | 22              |
| 900 series .....                  | —          | —          | —          | —              | 2               |
| <b>Robinson—TOTAL</b> .....       | <u>384</u> | <u>402</u> | <u>212</u> | <u>166</u>     | <u>195</u>      |
| R22 .....                         | 384        | 402        | 212        | 135            | 89              |
| R44 .....                         | —          | —          | —          | 31             | 106             |
| <b>Rogerson—TOTAL</b> .....       | <u>—</u>   | <u>2</u>   | <u>3</u>   | <u>—</u>       | <u>—</u>        |
| UH12E .....                       | —          | 2          | 3          | —              | —               |
| <b>Schweizer—TOTAL</b> .....      | <u>83</u>  | <u>78</u>  | <u>39</u>  | <u>45</u>      | <u>40</u>       |
| 300C .....                        | 83         | 78         | 39         | 40             | 35              |
| 330 .....                         | —          | —          | —          | 5              | 5               |
| <b>Sikorsky—TOTAL</b> .....       | <u>16</u>  | <u>18</u>  | <u>12</u>  | <u>9</u>       | <u>15</u>       |
| S-76 .....                        | 16         | 18         | 12         | 9              | 15              |

Source: Aerospace Industries Association, based on company reports.

NOTE: All data exclude production by foreign licensees.

a Domestic and export helicopter shipments for non-military use. Helicopters in military configuration exported to foreign governments and purchased under commercial contract are reported elsewhere. Models which may be shipped in either a civil or a military configuration appear in both tables.

b Reporting of F-28 and 280 series combined.

**DIRECT EXPORT SHIPMENTS OF MILITARY HELICOPTERS<sup>a</sup>**

Calendar Years 1990–1994

| Manufacturer and Model                        | 1990  | 1991  | 1992  | 1993  | 1994  |
|---|-------|-------|-------|-------|-------|
| <b>DIRECT MILITARY EXPORT SHIPMENTS</b> ..... | 48    | 45    | 51    | 61    | 30    |
| Value (Millions of Dollars) .....             | \$337 | \$489 | \$460 | \$429 | \$248 |
| Boeing Vertol CH-47/414/352 ...               | 11    | 9     | 6     | —     | —     |
| Robinson R22 .....                            | —     | —     | 10    | —     | —     |
| Sikorsky S-70C .....                          | 35    | 36    | 24    | 60    | 29    |
| Sikorsky S-76 .....                           | —     | —     | —     | 1     | —     |
| Sikorsky S-80M .....                          | 2     | —     | 11    | —     | 1     |

Source: Aerospace Industries Association, company reports.

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

## GENERAL AVIATION AIRCRAFT SHIPMENTS

By Selected Manufacturers  
Calendar Years 1990–1994

|  | 1990    | 1991               | 1992               | 1993               | 1994               |
|--|---------|--------------------|--------------------|--------------------|--------------------|
| <b>NUMBER OF AIRCRAFT SHIPPED</b>                                    | 1,144   | 1,021              | 899                | 964                | 928                |
| Single-Engine, Piston .....  | 608     | 564                | 510                | 516                | 444                |
| Multi-Engine, Piston .....   | 87      | 49                 | 41                 | 39                 | 55                 |
| Turboprop .....  | 281     | 222                | 177                | 211                | 207                |
| Turbojet .....   | 168     | 186                | 171                | 198                | 222                |
| <b>VALUE OF SHIPMENTS<sup>a</sup></b><br>(Millions of Dollars) ..... | \$2,008 | \$1,968            | \$1,836            | \$2,144            | \$2,357            |
| Single-Engine, Piston .....  | \$ 68   | \$ 93 <sup>b</sup> | \$ 92 <sup>b</sup> | \$ 76 <sup>b</sup> | \$ 94 <sup>b</sup> |
| Multi-Engine, Piston .....   | 24      | (b)                | (b)                | (b)                | (b)                |
| Turboprop .....  | 644     | 527                | 460                | 595                | 595                |
| Turbojet .....   | 1,272   | 1,348              | 1,284              | 1,473              | 1,681              |

**Number of Aircraft By  
Selected Manufacturer**

|                             |     |     |     |     |     |
|-----------------------------|-----|-----|-----|-----|-----|
| American Champion .....     | NA  | NA  | NA  | 38  | 22  |
| American General .....      | 10  | 82  | 51  | 30  | —   |
| Aviat .....                 | NA  | 71  | 63  | 56  | 47  |
| Bellanca .....              | 4   | 1   | 3   | 4   | 2   |
| Cessna .....                | 171 | 176 | 140 | 173 | 172 |
| Christen .....              | 68  | —   | —   | —   | —   |
| Classic .....               | 8   | 8   | 9   | 7   | 4   |
| Commander .....             | NA  | NA  | 25  | 31  | 22  |
| Fairchild .....             | 14  | 10  | 14  | 20  | 16  |
| Gulfstream .....            | 34  | 29  | 25  | 26  | 22  |
| Lake .....                  | 17  | 11  | 9   | 3   | —   |
| Learjet .....               | 25  | 25  | 23  | 38  | 36  |
| Maule .....                 | 28  | 66  | 33  | 70  | 65  |
| Mooney .....                | 147 | 88  | 69  | 64  | 71  |
| Piper .....                 | 178 | 41  | 85  | 99  | 132 |
| Raytheon <sup>c</sup> ..... | 433 | 402 | 348 | 305 | 317 |
| Taylorcraft .....           | 7   | 11  | 2   | —   | —   |

Source: General Aviation Manufacturers' Association.

a Manufacturers' net billing price.

b "Multi-Engine, Piston" combined with "Single-Engine, Piston."

c Formerly reported as Beech.

NA Not available.



**MILITARY AIRCRAFT ACCEPTED BY U.S. MILITARY AGENCIES**

Number and Flyaway Value  
Calendar Years 1980–1994

| Year                                     | TOTAL            | Bomber/<br>Patrol/<br>Command/<br>Control | Fighter/<br>Attack | Trans-<br>port/<br>Tanker | Trainer | Heli-<br>copter  | Other |
|--|------------------|---|--------------------|---------------------------|---------|------------------|-------|
| <b>NUMBER</b>                            |                  |   |                    |                           |         |                  |       |
| 1980                                     | 819              | 16  | 551                | 15                        | 18      | 189              | 30    |
| 1981                                     | 918              | 19  | 649                | 17                        | 60      | 158              | 15    |
| 1982                                     | 758              | 26  | 478                | 14                        | 60      | 172              | 8     |
| 1983                                     | 836              | 34  | 421                | 22                        | 120     | 233              | 6     |
| 1984                                     | 632              | 34  | 298                | 18                        | 30      | 240              | 12    |
| 1985                                     | 777              | 34  | 409                | 25                        | —       | 306              | 3     |
| 1986                                     | 818              | 52  | 424                | 76                        | —       | 266              | —     |
| 1987                                     | 858              | 74  | 483                | 36                        | —       | 265              | —     |
| 1988                                     | 842              | 55  | 509                | 31                        | —       | 247              | —     |
| 1989                                     | 706              | 24  | 408                | 21                        | —       | 253              | —     |
| 1990                                     | 763              | 24  | 454                | 25                        | —       | 260              | —     |
| 1991                                     | 650              | 17  | 395                | 23                        | —       | 215              | —     |
| 1992                                     | 544              | 10  | 312                | 30                        | 37      | 155              | —     |
| 1993 <sup>r</sup>                        | 583 <sup>r</sup> | 11  | 293                | 25                        | 56      | 198 <sup>r</sup> | —     |
| 1994                                     | 472              | 6   | 167                | 40                        | 114     | 142              | 3     |
| <b>FLYAWAY VALUE—Millions of Dollars</b> |                  |   |                    |                           |         |                  |       |
| 1980                                     | \$ 6,514         | \$ 475                                    | \$5,282            | \$ 178                    | \$ 32   | \$ 516           | \$31  |
| 1981                                     | 8,446            | 526                                       | 6,518              | 509                       | 32      | 825              | 19    |
| 1982                                     | 8,605            | 886                                       | 6,383              | 410                       | 42      | 872              | 12    |
| 1983                                     | 9,640            | 1,259                                     | 6,708              | 575                       | 79      | 1,009            | 10    |
| 1984                                     | 9,308            | 1,270                                     | 5,774              | 627                       | 18      | 1,597            | 22    |
| 1985                                     | 14,122           | 3,640                                     | 7,923              | 838                       | —       | 1,715            | 6     |
| 1986                                     | 20,903           | 8,177                                     | 8,004              | 2,665                     | —       | 2,057            | —     |
| 1987                                     | 21,459           | 8,569                                     | 8,900              | 2,218                     | —       | 1,772            | —     |
| 1988                                     | 16,031           | 2,911                                     | 8,953              | 2,314                     | —       | 1,853            | —     |
| 1989                                     | 11,968           | 1,423                                     | 7,735              | 743                       | —       | 2,067            | —     |
| 1990                                     | 13,036           | 1,499                                     | 8,731              | 600                       | —       | 2,201            | —     |
| 1991                                     | 11,754           | 1,023                                     | 8,517              | 437                       | —       | 1,777            | —     |
| 1992                                     | 11,482           | 613                                       | 7,673              | 1,346                     | 267     | 1,583            | —     |
| 1993 <sup>r</sup>                        | 12,101           | 1,530                                     | 6,400              | 1,553                     | 484     | 2,134            | —     |
| 1994                                     | 13,096           | 3,861                                     | 3,941              | 3,298                     | 468     | 1,511            | 17    |

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

NOTE: Data represent new U.S.-manufactured aircraft, excluding gliders and targets. Values include spares, spare parts, and support equipment that are procured with the aircraft. Includes aircraft accepted for shipment to foreign governments for military assistance programs and foreign military sales.

<sup>r</sup> Revised.

MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES AIR FORCE<sup>a</sup>

Calendar Years 1993–1994  
(Costs in Millions of Dollars)

| Type and Model                        | Number           |      | Flyaway Cost <sup>b</sup> |         | Weapon System Cost <sup>c</sup> |       |
|---------------------------------------|------------------|------|---------------------------|---------|---------------------------------|-------|
|                                       | 1993             | 1994 | 1993                      | 1994    | 1993                            | 1994  |
| <b>AIR FORCE—TOTAL</b> .....          | 187 <sup>r</sup> | 138  | \$5,094 <sup>r</sup>      | \$8,379 | NA <sup>r</sup>                 | NA    |
| <b>Bomber—TOTAL</b> .....             | 1                | 4    | \$ 977                    | \$3,628 | \$ NA                           | \$ NA |
| B-2 .....                             | 1                | 4    | 977                       | 3,628   | NA                              | NA    |
| <b>Fighter/Attack—TOTAL</b> .....     | 130              | 70   | 2,506 <sup>r</sup>        | 1,604   | NA                              | NA    |
| F-15 .....                            | 14               | 9    | 501                       | 322     | 736                             | 473   |
| F-16 .....                            | 116              | 61   | 2,005 <sup>r</sup>        | 1,282   | NA                              | NA    |
| <b>Transports/Tankers—TOTAL</b> ..... | 21 <sup>r</sup>  | 29   | 1,472 <sup>r</sup>        | 3,016   | 1,899 <sup>r</sup>              | 3,636 |
| C-17 .....                            | 5 <sup>r</sup>   | 7    | 1,322 <sup>r</sup>        | 2,332   | 1,710 <sup>r</sup>              | 2,836 |
| C-26 .....                            | 7                | —    | 24                        | —       | 24                              | —     |
| C-27A .....                           | 1                | —    | 17                        | —       | 17                              | —     |
| C-130 variants .....                  | 8                | 22   | 109                       | 684     | 148                             | 800   |
| <b>Trainer—TOTAL</b> .....            | 35               | 35   | 139 <sup>r</sup>          | 131     | 152 <sup>r</sup>                | 160   |
| T-1A .....                            | 35               | 35   | 139 <sup>r</sup>          | 131     | 152 <sup>r</sup>                | 160   |

Source: Department of the Air Force.

a Air Force acceptances for own use; excludes FMS/MAP shipments.

b Flyaway Cost includes airframe, engines, electronics, communications, armament, other installed equipment, and non-recurring costs associated with the manufacture of aircraft.

c Weapon system cost includes flyaway costs, peculiar ground equipment, training equipment, and technical data.

NA Not available.

r Revised.

MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES ARMY<sup>a</sup>

Calendar Years 1993–1994

| Type and Model                        | Number |      | Flyaway Cost <sup>b</sup> |       | Weapon System Cost <sup>c</sup> |       |
|---------------------------------------|--------|------|---------------------------|-------|---------------------------------|-------|
|                                       | 1993   | 1994 | 1993                      | 1994  | 1993                            | 1994  |
| <b>ARMY—TOTAL</b> .....               | 107    | 130  | \$871                     | \$453 | \$981                           | \$485 |
| <b>Helicopters—TOTAL</b> .....        | 106    | 63   | \$867                     | \$381 | \$977                           | \$412 |
| AH-64A .....                          | 46     | —    | 512                       | —     | 576                             | —     |
| UH-60L .....                          | 60     | 63   | 355                       | 381   | 401                             | 412   |
| <b>Transports/Tankers—TOTAL</b> ..... | 1      | 1    | 4                         | 4     | 4                               | 4     |
| C-26 .....                            | 1      | 1    | 4                         | 4     | 4                               | 4     |
| <b>Trainer—TOTAL</b> .....            | —      | 63   | —                         | 51    | —                               | 52    |
| TH-67 .....                           | —      | 63   | —                         | 51    | —                               | 52    |
| <b>Other—TOTAL</b> .....              | —      | 3    | —                         | 17    | —                               | 17    |
| RC-12 .....                           | —      | 3    | —                         | 17    | —                               | 17    |

Source: Department of the Army.

a Army acceptances for own use; excludes FMS/MAP shipments.

b Flyaway cost includes airframes, engines, electronics, communications, armament and other installed equipment.

c Weapon System Cost includes flyaway cost, initial spares, ground equipment, training equipment and other support items.

**MILITARY AIRCRAFT ACCEPTANCES BY UNITED STATES NAVY<sup>a</sup>**  
**Calendar Years 1993–1994**  
**(Costs in Millions of Dollars)**

| Type and Model                     | Number                |           | Flyaway Cost <sup>b</sup> |               | Weapon System Cost <sup>c</sup> |               |
|------------------------------------|-----------------------|-----------|---------------------------|---------------|---------------------------------|---------------|
|                                    | 1993                  | 1994      | 1993                      | 1994          | 1993                            | 1994          |
| <b>NAVY—TOTAL</b> .....            | 143                   | 141       | \$3,636 <sup>r</sup>      | \$3,339       | \$4,935 <sup>r</sup>            | \$4,720       |
| <b>Patrol—TOTAL</b> .....          | <u>6</u>              | <u>2</u>  | <u>\$ 337</u>             | <u>\$ 233</u> | <u>\$ 463</u>                   | <u>\$ 333</u> |
| E-2C .....                         | 6                     | 2         | 337                       | 233           | 463                             | 333           |
| <b>Fighter/Attack—TOTAL</b> .....  | <u>75</u>             | <u>63</u> | <u>2,230<sup>r</sup></u>  | <u>1,738</u>  | <u>2,906</u>                    | <u>2,677</u>  |
| F-14 .....                         | 5                     | 4         | 295 <sup>r</sup>          | 233           | 435                             | 342           |
| F/A-18 .....                       | 46                    | 46        | 1,466                     | 1,227         | 1,966                           | 1,961         |
| AV-8B .....                        | 24                    | 13        | 469                       | 278           | 505                             | 374           |
| <b>Transports/Tankers—TOTAL</b> .. | <u>3<sup>r</sup></u>  | <u>10</u> | <u>77<sup>r</sup></u>     | <u>278</u>    | <u>82<sup>r</sup></u>           | <u>308</u>    |
| C-20G .....                        | —                     | 5         | —                         | 142           | —                               | 158           |
| C-130T .....                       | 1 <sup>r</sup>        | 3         | 25 <sup>r</sup>           | 75            | 28 <sup>r</sup>                 | 84            |
| KC-130 .....                       | 2                     | 2         | 52                        | 61            | 54                              | 66            |
| <b>Trainers—TOTAL</b> .....        | <u>21</u>             | <u>16</u> | <u>345<sup>r</sup></u>    | <u>286</u>    | <u>580<sup>r</sup></u>          | <u>474</u>    |
| T-45A .....                        | 21                    | 16        | 345 <sup>r</sup>          | 286           | 580 <sup>r</sup>                | 474           |
| <b>Helicopters—TOTAL</b> .....     | <u>38<sup>r</sup></u> | <u>50</u> | <u>647<sup>r</sup></u>    | <u>804</u>    | <u>904<sup>r</sup></u>          | <u>928</u>    |
| AH-1W .....                        | 7                     | 21        | 56                        | 203           | 71                              | 223           |
| CH-53 .....                        | 11                    | 4         | 241                       | 90            | 282                             | 96            |
| MH-53 .....                        | 3 <sup>r</sup>        | 13        | 72 <sup>r</sup>           | 314           | 154 <sup>r</sup>                | 361           |
| SH-60B .....                       | 7                     | 12        | 124                       | 197           | 199 <sup>r</sup>                | 248           |
| SH-60F .....                       | 10                    | —         | 154                       | —             | 198                             | —             |

Source: Department of the Navy.

a Navy acceptances for own use; excludes FMS shipments.

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

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

r Revised.

**MILITARY AIRCRAFT ACCEPTANCES  
FOR REIMBURSABLE PROGRAMS<sup>a</sup>**

Calendar Years 1993–1994  
(Millions of Dollars)

| Accepting Agency,<br>Type, and Model                   | Number of<br>Aircraft Accepted |           | Flyaway<br>Cost <sup>b</sup> |            |
|--|--------------------------------|-----------|------------------------------|------------|
|  | 1993                           | 1994      | 1993                         | 1994       |
| <b>TOTAL ACCEPTANCES FOR<br/>REIMBURSABLE PROGRAMS</b> | 146 <sup>r</sup>               | 63        | \$2,500 <sup>r</sup>         | \$925      |
| <b>AIR FORCE—TOTAL</b>                                 | 74                             | 34        | \$1,413                      | \$599      |
| <b>Fighter Attack—TOTAL</b>                            | <u>74</u>                      | <u>34</u> | <u>1,413</u>                 | <u>599</u> |
| F-16   | 74                             | 34        | 1,413                        | 599        |
| <b>NAVY—TOTAL</b>                                      | 30 <sup>r</sup>                | 1         | \$ 600 <sup>r</sup>          | \$ 10      |
| <b>Patrol—TOTAL</b>                                    | <u>4</u>                       | <u>—</u>  | <u>216</u>                   | <u>—</u>   |
| E-2  | 4                              | —         | 216                          | —          |
| <b>Fighter/Attack—TOTAL</b>                            | <u>14</u>                      | <u>—</u>  | <u>251</u>                   | <u>—</u>   |
| F/A-18   | 14                             | —         | 251                          | —          |
| <b>Helicopters—TOTAL</b>                               | <u>12<sup>r</sup></u>          | <u>1</u>  | <u>133<sup>r</sup></u>       | <u>10</u>  |
| AH-1   | 12 <sup>r</sup>                | 1         | 133 <sup>r</sup>             | 10         |
| <b>ARMY—TOTAL</b>                                      | 42 <sup>r</sup>                | 28        | \$ 487 <sup>r</sup>          | \$316      |
| <b>Helicopters—TOTAL</b>                               | <u>42<sup>r</sup></u>          | <u>28</u> | <u>487<sup>r</sup></u>       | <u>316</u> |
| AH-64  | 42 <sup>r</sup>                | 26        | 487 <sup>r</sup>             | 301        |
| UH-60  | —                              | 2         | —                            | 15         |

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

a Foreign government aircraft purchases through the Department of Defense Foreign Military Sales program.

b Flyaway cost includes airframes, engines, electronics, communications, armament, other installed equipment, and non-recurring costs associated with the manufacture of the aircraft.

E Estimate.

r Revised.

**MILITARY AIRCRAFT PROGRAM PROCUREMENT**

Fiscal Years 1994, 1995, and 1996  
(Millions of Dollars<sup>a</sup>)

| Agency and Model                | 1994 |          | 1995 <sup>E</sup> |          | 1996 <sup>E</sup> |          |
|---------------------------------|------|----------|-------------------|----------|-------------------|----------|
|                                 | No.  | Cost     | No.               | Cost     | No.               | Cost     |
| <b>AIR FORCE</b>                |      |          |                   |          |                   |          |
| B-1B .....                      | —    | \$ 165.8 | —                 | \$ 138.3 | —                 | \$ 56.3  |
| B-2 Spirit .....                | —    | 564.7    | —                 | 337.0    | —                 | 279.9    |
| C-17 Globemaster III .....      | 6    | 2,086.3  | 6                 | 2,342.0  | 8                 | 2,402.5  |
| C-130 Hercules .....            | —    | —        | —                 | —        | 2                 | 88.6     |
| Civil Air Patrol Aircraft ..... | 27   | 3.6      | 14                | 1.4      | 27                | 2.6      |
| E-8A JSTARS .....               | 2    | 555.2    | 2                 | 654.7    | 2                 | 491.8    |
| Enhanced Flight Screener ..     | 33   | 9.9      | —                 | —        | —                 | —        |
| F-15E Eagle .....               | —    | 28.6     | —                 | 20.3     | —                 | —        |
| F-16 Falcon .....               | 12   | 449.3    | —                 | 75.0     | —                 | —        |
| JPATS <sup>b</sup> .....        | —    | —        | 3                 | 92.7     | 3                 | 55.0     |
| Non-Development Airlift ...     | —    | 98.0     | —                 | —        | —                 | 183.8    |
| T-1A Jayhawk .....              | 35   | 140.8    | 32                | 154.1    | —                 | 4.4      |
| <b>ARMY</b>                     |      |          |                   |          |                   |          |
| AH-64 Apache .....              | 10   | \$ 167.6 | —                 | \$ 156.5 | —                 | \$ 358.1 |
| C-21A .....                     | 1    | 5.5      | —                 | —        | —                 | —        |
| New Training Helicopter ...     | 35   | 29.3     | —                 | 0.5      | —                 | 0.5      |
| OH-58D Kiowa Warrior ...        | —    | 226.2    | —                 | 217.2    | —                 | 71.3     |
| UH-60 Black Hawk .....          | 63   | 427.6    | 60                | 316.1    | 60                | 334.9    |
| <b>NAVY</b>                     |      |          |                   |          |                   |          |
| AH-1W Sea Cobra .....           | 12   | \$ 139.2 | 12                | \$ 140.7 | —                 | \$ 10.4  |
| AV-8B Harrier .....             | 4    | 136.6    | 4                 | 130.3    | 4                 | 169.7    |
| CH/MH-53E Super Stallion ..     | 12   | 290.7    | —                 | 34.3     | —                 | —        |
| E-2C Hawkeye .....              | —    | 37.8     | 4                 | 282.4    | 3                 | 214.2    |
| EA-6B Prowler .....             | —    | 77.6     | —                 | —        | —                 | —        |
| F/A-18 Hornet .....             | 36   | 1,609.2  | 24                | 1,016.2  | 12                | 846.8    |
| HH-60H .....                    | 17   | 222.6    | —                 | 40.5     | —                 | 23.9     |
| SH-60B Seahawk .....            | 7    | 215.7    | —                 | —        | —                 | 13.7     |
| SH-60F CV ASW .....             | —    | 65.0     | —                 | 7.5      | —                 | —        |
| T-45 Goshawk .....              | 12   | 290.0    | 12                | 245.4    | 12                | 316.1    |
| V-22 Osprey .....               | —    | —        | —                 | —        | —                 | 48.0     |

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

NOTE: See Research and Development Chapter for aircraft program RDT&E authorization data.

a Total Obligational Authority for procurement, excluding initial spares.

b Navy and Air Force funding.

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

**ACTIVE U.S. MILITARY AIRCRAFT<sup>a</sup> IN CONTINENTAL U.S.**  
**Fiscal Years 1980–1999**

| Year              | Total <sup>a</sup> | Fixed-Wing Aircraft |        |           |        | Helicopters |
|-------------------|--------------------|---------------------|--------|-----------|--------|-------------|
|                   |                    | Total               | Jet    | Turboprop | Piston |             |
| 1980              | 18,969             | 11,362              | 8,794  | 1,869     | 699    | 7,607       |
| 1981              | 19,363             | 11,645              | 9,111  | 1,943     | 591    | 7,718       |
| 1982              | 21,728             | 12,063              | 9,647  | 1,900     | 516    | 9,665       |
| 1983              | 18,652             | 11,603              | 9,495  | 1,745     | 363    | 7,049       |
| 1984              | 18,833             | 11,661              | 9,551  | 1,777     | 333    | 7,172       |
| 1985              | 19,333             | 11,929              | 9,640  | 1,881     | 408    | 7,404       |
| 1986              | 20,157             | 11,919              | 9,730  | 1,803     | 386    | 8,238       |
| 1987              | 20,514             | 12,054              | 9,819  | 1,865     | 370    | 8,460       |
| 1988              | 21,010             | 12,481              | 9,954  | 2,222     | 305    | 8,529       |
| 1989              | 19,223             | 11,893              | 9,501  | 2,131     | 261    | 7,330       |
| 1990              | 20,017             | 12,817              | 10,360 | 2,199     | 258    | 7,200       |
| 1991              | 19,966             | 12,587              | 10,221 | 2,119     | 247    | 7,379       |
| 1992              | 19,210             | 11,936              | 9,672  | 2,035     | 229    | 7,274       |
| 1993              | 17,231             | 9,681               | 7,651  | 1,852     | 178    | 7,550       |
| 1994 <sup>E</sup> | 17,018             | 9,803               | 7,786  | 1,835     | 182    | 7,215       |
| 1995 <sup>E</sup> | 16,207             | 9,277               | 7,294  | 1,754     | 229    | 6,930       |
| 1996 <sup>E</sup> | 15,425             | 9,114               | 7,111  | 1,733     | 270    | 6,311       |
| 1997 <sup>E</sup> | 14,645             | 8,949               | 6,988  | 1,688     | 273    | 5,696       |
| 1998 <sup>E</sup> | 14,309             | 8,858               | 6,918  | 1,668     | 272    | 5,451       |
| 1999 <sup>E</sup> | 14,199             | 8,849               | 6,919  | 1,660     | 270    | 5,350       |

Source: Office of the Secretary of Defense, as reported in "FAA Aviation Forecasts" (Annually).

<sup>a</sup> Includes Army, Air Force, Navy, and Marine regular service aircraft, as well as Reserve and National Guard Aircraft.  
<sup>E</sup> Estimate.

**DEPARTMENT OF DEFENSE  
OUTLAYS FOR AIRCRAFT PROCUREMENT**

By Agency  
Fiscal Years 1962–1996  
(Millions of Dollars)

| Year              | TOTAL<br>AIRCRAFT<br>PROCUREMENT | Air Force | Navy     | Army   |
|-------------------|----------------------------------|-----------|----------|--------|
| 1962              | \$ 6,659                         | \$ 4,387  | \$ 2,102 | \$ 170 |
| 1963              | 6,309                            | 3,747     | 2,328    | 234    |
| 1964              | 6,053                            | 3,894     | 1,859    | 300    |
| 1965              | 5,200                            | 3,115     | 1,739    | 346    |
| 1966              | 6,635                            | 4,074     | 2,021    | 540    |
| 1967              | 8,411                            | 4,842     | 2,607    | 962    |
| 1968              | 9,462                            | 5,079     | 3,244    | 1,139  |
| 1969              | 9,177                            | 5,230     | 2,821    | 1,126  |
| 1970              | 7,948                            | 4,623     | 2,488    | 837    |
| 1971              | 6,631                            | 3,960     | 2,125    | 546    |
| 1972              | 5,927                            | 3,191     | 2,347    | 389    |
| 1973              | 5,066                            | 2,396     | 2,557    | 113    |
| 1974              | 5,006                            | 2,078     | 2,806    | 122    |
| 1975              | 5,484                            | 2,211     | 3,137    | 136    |
| 1976              | 6,520                            | 3,323     | 3,061    | 136    |
| Tr. Qtr.          | 1,557                            | 859       | 672      | 26     |
| 1977              | 6,608                            | 3,586     | 2,721    | 301    |
| 1978              | 6,971                            | 3,989     | 2,602    | 380    |
| 1979              | 8,836                            | 5,138     | 3,140    | 558    |
| 1980              | 11,124                           | 6,647     | 3,689    | 787    |
| 1981              | 13,193                           | 7,941     | 4,397    | 855    |
| 1982              | 16,793                           | 9,624     | 5,872    | 1,297  |
| 1983              | 21,013                           | 11,799    | 7,490    | 1,724  |
| 1984              | 23,196                           | 12,992    | 8,040    | 2,165  |
| 1985              | 26,586                           | 15,619    | 8,263    | 2,705  |
| 1986              | 30,828                           | 18,919    | 8,922    | 2,987  |
| 1987              | 32,956                           | 20,036    | 9,614    | 3,306  |
| 1988              | 28,246                           | 15,961    | 9,407    | 2,878  |
| 1989              | 27,569                           | 14,662    | 10,073   | 2,834  |
| 1990              | 26,142                           | 14,303    | 9,731    | 2,808  |
| 1991              | 25,689                           | 13,794    | 9,055    | 2,840  |
| 1992              | 23,581                           | 13,154    | 7,907    | 2,520  |
| 1993              | 20,359                           | 11,438    | 7,246    | 1,675  |
| 1994              | 18,840                           | 10,303    | 6,826    | 1,711  |
| 1995 <sup>E</sup> | 16,249                           | 9,239     | 5,610    | 1,400  |
| 1996 <sup>E</sup> | 14,544                           | 8,379     | 4,964    | 1,201  |

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

NOTE: Detail may not add to totals because of rounding.

<sup>E</sup> Estimate. Latest year reflects Administration's budget proposal.

Tr. Qtr. See Glossary.



## SPECIFICATIONS OF U.S. MILITARY AIRCRAFT

### On Order or in Production as of 1994

| Primary Mission, DoD Designation, & Popular Name | Manufacturer | U.S. Military Service | Crew | Empty Weight (000's lbs) | Engines                  | Performance Typical for Primary Mission | Remarks  |
|--|--------------|-----------------------|------|--------------------------|--------------------------|---|--|
| <b>ATTACK</b>                                    |              |                       |      |                          |                          |   |  |
| AV-8B Harrier II                                 | MDC/BAe      | USMC                  | 1    | 13                       | 1xRR F402                | Mach 0.91                               | VTOL   |
| <b>BOMBERS</b>                                   |              |                       |      |                          |                          |   |  |
| B-2 Spirit                                       | NGC          | USAF                  | 2    | 100-110                  | 4xGE F118                | 6,000 n.m.                              | Radar eluding tactical bomber                                      |
| <b>FIGHTERS</b>                                  |              |                       |      |                          |                          |   |  |
| F-15E Eagle                                      | MDC          | USAF                  | 2    | 37                       | 2xP&W F100               | Mach 2.5 class                          | Dual role fighter/long range interdiction                          |
| F-16A/B Fighting Falcon                          | LM           | USAF                  | 1-2  | 16                       | 1xP&W F100               | Mach 2+ class                           | Multirole fighter; fully fly-by-wire; missiles, guns.              |
| F-16C/D Fighting Falcon                          | LM           | USAF                  | 1-2  | 18                       | 1xP&W F100/<br>1xGE F110 | Mach 2+ class                           | Provisions for AMRAAM, LANTIRN, and new EW Nav. Comm. Systems      |
| F/A-18C/D Hornet                                 | MDC/NGC      | USN/USMC              | 1-2  | 23                       | 2xGE F404                | Mach 1.7 class                          | Multi-mission night strike fighter                                 |
| F/A-18E/F Hornet                                 | MDC/NGC      | USN/USMC              | 1-2  | 31                       | 2xGE F414                | Mach 1.8 class                          | Multi-mission night strike fighter                                 |
| F-22A/B  | LM/Boeing    | USAF                  | 1-2  | 30                       | 2xPW F119                | Mach 2+ class                           | Air superiority with ground attack; B model is tandem-seat version |
| <b>COMMAND/CONTROL AND PATROL</b>                |              |                       |      |                          |                          |   |  |
| E-2C Hawkeye                                     | NGC          | USN                   | 5    | 40                       | 2xAll T56                | 6 hr. mission duration                  | AEW command & control; active & passive detection                  |
| <b>CARGO-TRANSPORT</b>                           |              |                       |      |                          |                          |   |  |
| C-17A  | MDC          | USAF                  | 3    | 267                      | 4xP&W F117               | Mach 0.77; 3,000 n.m.                   | 102 troops or 172,000 lbs.   |
| C-20F/G/H  | Gulfstream   | All                   | 2    | 42-43                    | 2xRR Tay                 | Mach. 0.80; 4,200 n.m.                  | Versions of Gulfstream IV  |
| C-26B  | Fairchild    | USAF/Army             | 2    | 9                        | 2xGA TPE 331             | 285 mph; 2,000 mi.                      | US version of SA227-DC Metro 23                                    |
| C-27 Spartan                                     | Chrysler     | USAF                  | 2    | 36                       | 2xGE T64                 | 288 mph; 1,500 n.m.                     | USAF version of Alenia G-222                                       |
| C-29A  | BAe          | USAF                  | 2-3  | 15                       | 2xGA TFE 731             | Mach 0.87; 2,870 n.m.                   | USAF version of BAe 125  |
| C/HC-130H Hercules                               | LM           | USAF/USN              | 4    | 74-78                    | 4xAll T56                | 370 mph; 3,450 mi.                      | 64-92 troops or 39-41,000 lbs.                                     |
| KC-130T  | LM           | USN/USMC              | 5-7  | 80                       | 4xAll T56                | 9,200 gals.                             | Tanker   |
| MC-130H Combat Talon II                          | LM           | USAF                  | 5    | 76                       | 4xAll T56                | 370 mph; 3,450 mi.                      | Support requirements of SOF  |
| V-22 Osprey                                      | Bell/Boeing  | USMC/SOF              | 3    | 32                       | 2xAll T406               | Max 316 mph; 2,100 n.m.                 | With internal fuel tanks, engines tilt for VTOL                    |
| <b>TRAINING</b>                                  |              |                       |      |                          |                          |   |  |
| T-1A Jayhawk                                     | Beech        | USAF                  | 3    | 10                       | 2xP&W JT-15D             | Max 538 mph                             | Tanker/transport trainer   |
| T-45A Goshawk                                    | MDC/BAe      | USN                   | 2    | 9                        | 1xRR F405                | Mach 1.04 at 25,000 ft.                 | Next generation trainer  |
| TH-67 Creek                                      | Bell         | Army                  | 1    | 2                        | 1xAll 250                | Max 135 mph; 405 mi.                    | Rotary wing trainer  |
| <b>HELICOPTERS</b>                               |              |                       |      |                          |                          |   |  |
| AH-1W Super Cobra                                | Bell         | USN                   | 2    | 10                       | 2xGE T700                | Max 218 mph; 395 mi.                    | TOW, hellfire, sidewinder  |
| AH-64 Apache                                     | MDC          | Army                  | 2    | 11                       | 2xGE T700                | Max 197 mph; 445 mi.                    | Attack helicopter  |
| CH/MH-53E  | Sikorsky     | USN                   | 3-8  | 33-36                    | 3xGE T64                 | Max 196 mph; 710 mi.                    | 55 passengers, aux. tanks/ minesweeping                            |
| HH-60H   | Sikorsky     | USN                   | 4-12 | 14                       | 2xGE T700                | Max 184 mph; 500 mi.                    | Combat strike and rescue   |
| MH-60G Pave Hawk                                 | Sikorsky     | USAF/Army             | 3    | 12                       | 2xGE T700                | Max 184 mph; 1,380 mi.                  | 11 troops; combat; search; rescue                                  |
| OH-580 Kiowa Warrior                             | Bell         | Army                  | 2    | 3                        | 1xAll T703               | Max 127 mph; 220 mi.                    | Armed attack/reconnaissance  |
| SH-2G Super Sea-Sprite                           | Kaman        | USN                   | 3-4  | 8                        | 2xGE T700                | Max 159 mph; 500 mi.                    | LAMPS Mk.1 helicopter  |
| SH-60B Seahawk                                   | Sikorsky     | USN                   | 3    | 15                       | 2xGE T700                | Max 171 mph; 640 mi.                    | ASW  |
| SH-60F   | Sikorsky     | USN                   | 4    | 14                       | 2xGE T700                | Max 177 mph; 789 mi.                    | ASW  |
| UH-60 Black Hawk                                 | Sikorsky     | Army/USAF             | 3    | 11                       | 2xGE T700                | Max 184 mph; 373 mi.                    | UTTAS  |

Source: Aerospace Industries Association, based on company reports.

KEY: All = Allison Gas Turbine; BAe = British Aerospace; GA = Garrett Engine; GE = General Electric; LM = Lockheed Martin; MDC = McDonnell Douglas; NGC = Northrop Grumman; P&W = Pratt & Whitney; RR = Rolls Royce.

# Missile Programs

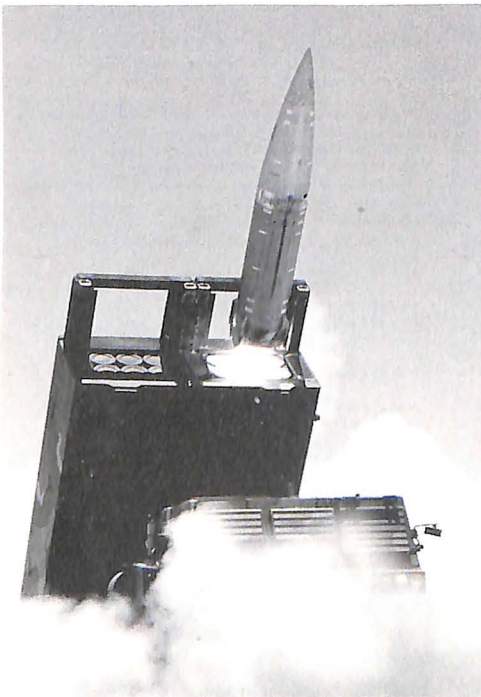
The downward trend in the industry's missile production activity, first evidenced in 1988, continued in 1994. In current dollar terms, sales of missile systems dropped to the lowest level since 1981. The flow of new orders fell below \$3 billion for the first time since 1978 and the industry's missile backlog dipped to its lowest point in 14 years.

Data compiled by the Bureau of the Census shows 1994 sales of missile systems and parts (excluding propulsion units) at \$5.3 billion, down more than 30 percent from the previous year's \$7.7 billion. Net new

orders amounted to only \$2.8 billion in 1994, which compares with \$4.8 billion in 1993. The backlog for missile systems at year-end 1994 was \$6 billion, down sharply—by more than 35 percent—from \$9.3 billion at the end of the previous year.

The downward trend is further evidenced in a summary of Department of Defense (DoD) outlays for missile procurement. In the decade of the 1980s, outlays rose steadily from \$4.4 billion in 1980 to \$14.5 billion at the end of the decade. In Fiscal Year (FY) 1990, total outlays reached an all-time peak of \$14.9 billion. Since then, outlays in each fiscal year have dropped below those of the prior year: FY 1991, \$14.4 billion; FY 1992, \$13.5 billion; FY 1993, \$11.4 billion; FY 1994, \$8.9 billion; and FY 1995, \$8.1 billion. The trend continues with planned outlays of \$7.0 billion in FY 1996. A breakdown allocates \$3.9 billion to the Air Force, \$2.2 billion to Navy, and \$0.9 billion to Army.

Where DoD was at one time funding several missile programs at more than \$1 billion a year, the greatest expenditure in FY 1995 was \$670 million for the Navy's Trident II Fleet Ballistic Missile. The largest Air Force program was the AMRAAM (Advanced Medium Range Air-to-Air Missile) at \$376 million. The Army's top procure-



ment program was the AAWS-M (Advanced Antitank Weapon System-Medium) at \$213 million. The Patriot long-range air defense missile program, jointly funded by the Army and the Ballistic Missile Defense Organization (BMDO), was allocated \$253 million.

Missile programs in production or in operational service during 1994/95 and planned for funding under FY 1996 appropriations included:

*Air Force:* AMRAAM, \$282 million; AGM-130 air-to-surface weapon, \$69 million.

*Navy:* Trident II, \$522 million,

the largest DoD missile procurement account for FY 1996; the Standard air defense missile, \$239 million; the Tomahawk cruise missile, \$168 million; the RAM (Rolling Airframe Missile), \$70 million; and the Harpoon cruise missile, \$46 million.

*Army:* The Hellfire helicopter-launched antiarmor missile, \$210 million; the AAWS-M, \$171 million; the ATACMS (Army TACTical Missile System), \$107 million; the Avenger mobile anti-aircraft weapon system, \$31 million; and the TOW antitank missile, \$7 million.

*BMDO:* The Patriot air defense system, \$400 million.



**MISSILE PROGRAM PROCUREMENT**

Fiscal Years 1994, 1995, and 1996  
(Millions of Dollars<sup>a</sup>)

| Agency and Model           | 1994  |          | 1995 <sup>E</sup> |         | 1996 <sup>E</sup> |         |
|----------------------------|-------|----------|-------------------|---------|-------------------|---------|
|                            | No.   | Cost     | No.               | Cost    | No.               | Cost    |
| <b>AIR FORCE</b>           |       |          |                   |         |                   |         |
| AGM-130 .....              | 102   | \$ 70.4  | 102               | \$ 68.8 | —                 | \$ 69.3 |
| AMRAAM <sup>b</sup> .....  | 1,082 | 523.5    | 519               | 376.3   | 406               | 281.5   |
| HAVE NAP .....             | —     | 5.0      | 36                | 25.8    | —                 | —       |
| <b>NAVY</b>                |       |          |                   |         |                   |         |
| Harpoon .....              | 75    | \$ 86.0  | 58                | \$ 68.2 | 30                | \$ 46.4 |
| JSOW .....                 | —     | —        | —                 | —       | —                 | 26.2    |
| RAM .....                  | 180   | 53.3     | 240               | 64.5    | 230               | 69.8    |
| Standard .....             | 202   | 214.1    | 202               | 252.4   | 151               | 238.5   |
| Tomahawk .....             | 216   | 257.5    | 217               | 243.9   | 164               | 167.7   |
| Trident II .....           | 24    | 1,098.6  | 18                | 670.2   | 6                 | 522.0   |
| <b>ARMY</b>                |       |          |                   |         |                   |         |
| AAWS-M .....               | 703   | \$ 207.3 | 872               | \$212.6 | 557               | \$171.4 |
| ATACMS .....               | 255   | 145.6    | 148               | 115.0   | 91                | 107.0   |
| Avenger <sup>c</sup> ..... | 144   | 135.2    | —                 | 13.7    | —                 | 31.4    |
| Hellfire .....             | 3,348 | 150.6    | 1,245             | 132.7   | 352               | 209.5   |
| MLRS .....                 | —     | 78.4     | —                 | 25.9    | —                 | 3.1     |
| TOW 2 <sup>d</sup> .....   | 2,000 | 67.8     | 1,503             | 37.2    | —                 | 7.4     |
| <b>BMDO</b>                |       |          |                   |         |                   |         |
| Patriot <sup>f</sup> ..... | NA    | NA       | —                 | \$253.1 | —                 | \$399.5 |

Source: Department of Defense, "Program Acquisition Costs by Weapon System" (Annually).

NOTE: See Research and Development Chapter for missile program RDT&E authorization data.

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

b Navy and Air Force funding.

c Army and Navy funding.

d Army and Marine Corps funding.

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

f Army and BMDO funding.

NA Not available.

**DEPARTMENT OF DEFENSE  
OUTLAYS FOR MISSILE PROCUREMENT**

By Agency  
Fiscal Years 1962–1996  
(Millions of Dollars)

| Year              | TOTAL<br>MISSILE<br>PROCUREMENT | Air Force | Navy               | Army   |
|-------------------|---------------------------------|-----------|--------------------|--------|
| 1962              | \$ 3,442                        | \$2,385   | \$ 593             | \$ 464 |
| 1963              | 3,817                           | 2,676     | 718                | 423    |
| 1964              | 3,577                           | 2,100     | 981                | 496    |
| 1965              | 2,096                           | 1,320     | 522                | 254    |
| 1966              | 2,069                           | 1,313     | 512                | 244    |
| 1967              | 1,930                           | 1,278     | 432                | 220    |
| 1968              | 2,219                           | 1,388     | 436                | 395    |
| 1969              | 2,509                           | 1,382     | 534                | 593    |
| 1970              | 2,912                           | 1,467     | 702                | 743    |
| 1971              | 3,140                           | 1,497     | 791                | 852    |
| 1972              | 3,009                           | 1,334     | 831                | 844    |
| 1973              | 3,023                           | 1,454     | 628                | 941    |
| 1974              | 2,981                           | 1,537     | 541                | 903    |
| 1975              | 2,889                           | 1,602     | 615                | 672    |
| 1976              | 2,296                           | 1,549     | 584                | 163    |
| Tr. Qtr.          | 402                             | 347       | 148                | (93)   |
| 1977              | 2,781                           | 1,501     | 905                | 374    |
| 1978              | 3,096 <sup>a</sup>              | 1,376     | 1,302 <sup>a</sup> | 418    |
| 1979              | 3,786                           | 1,537     | 1,702              | 547    |
| 1980              | 4,434                           | 1,810     | 1,973              | 651    |
| 1981              | 5,809                           | 2,366     | 2,297              | 1,146  |
| 1982              | 6,782                           | 3,069     | 2,444              | 1,269  |
| 1983              | 7,795                           | 3,383     | 2,812              | 1,600  |
| 1984              | 9,527                           | 4,640     | 2,809              | 2,079  |
| 1985              | 10,749                          | 5,409     | 2,941              | 2,399  |
| 1986              | 11,731                          | 6,473     | 2,780              | 2,478  |
| 1987              | 11,473                          | 6,002     | 3,157              | 2,314  |
| 1988              | 11,676                          | 6,046     | 3,392              | 2,239  |
| 1989              | 14,503                          | 7,349     | 4,445              | 2,709  |
| 1990              | 14,851                          | 7,951     | 4,446              | 2,453  |
| 1991              | 14,400                          | 6,906     | 4,954              | 2,540  |
| 1992              | 13,504                          | 6,409     | 4,694              | 2,401  |
| 1993              | 11,404                          | 5,424     | 3,794              | 2,187  |
| 1994              | 8,934                           | 4,312     | 3,238              | 1,384  |
| 1995 <sup>E</sup> | 8,072                           | 4,267     | 2,641              | 1,164  |
| 1996 <sup>E</sup> | 7,035                           | 3,928     | 2,181              | 926    |

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

NOTE: Detail may not add to totals because of rounding.

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

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

Tr. Qtr. See Glossary.

## MAJOR MISSILE PROGRAMS RESEARCH, DEVELOPMENT, PRODUCTION, OPERATION

| Program               | Agency   | Status | Systems Contractor | Propulsion Manufacturer | Guidance Manufacturer           |
|-----------------------|----------|--------|--------------------|-------------------------|---------------------------------|
| <b>AIR-TO-AIR</b>     |          |        |                    |                         |                                 |
| AMRAAM-120A           | USAF/USN | D,P    | Hughes/Ray         | Alliant/<br>Aerojet     | Hughes/Ray                      |
| Phoenix-54A           | USN      | O      | Hughes/Ray         | Alliant                 | Hughes                          |
| Phoenix-54C           | USN      | P,O    | Hughes/Ray         | Alliant                 | Hughes/Ray                      |
| Sidewinder-9J         | USAF     | O      | Loral              | Alliant/<br>Aerojet     | Loral                           |
| Sidewinder-9L         | USN/USAF | O      | NASC               | Bermite/TKC/<br>Alliant | Raytheon/<br>Loral              |
| Sidewinder-9M         | USN/USAF | O      | NASC               | TKC/Alliant             | Ray/Loral                       |
| Sidewinder-9N         | USAF     | O      | Loral              | Alliant/<br>Aerojet     | Loral                           |
| Sidewinder-9P         | USAF     | P,O    | Loral              | Alliant/<br>Aerojet     | Loral                           |
| Sidewinder-9S         | USN      | P,O    | NASC               | TKC/Alliant             | Loral/Ray                       |
| Sparrow-7F            | USN/USAF | O      | NASC               | Alliant                 | Ray/Hughes                      |
| Sparrow-7M            | USN/USAF | P      | Ray/Hughes         | Alliant                 | Ray/Hughes                      |
| Sparrow-7P            | USN      | D      | NASC               | Alliant                 | Raytheon                        |
| Sparrow-7R            | USN      | D      | NASC               | Alliant                 | Ray/Hughes                      |
| <b>AIR-TO-SURFACE</b> |          |        |                    |                         |                                 |
| AGM-129               | USAF     | O      | Hughes/MDC         | WI                      | Kearfott                        |
| AGM-130A/B            | USAF     | D      | RI                 | Alliant                 | RI                              |
| AGM-142               | USAF     | O      | LM/Rafael          | Rafael                  | GEC                             |
| AGM-86B/C             | USAF     | P,O    | Boeing             | WI                      | Honeywell/<br>Litton            |
| GBU-15                | USAF     | P      | RI                 | —                       | RI                              |
| HARM-88A/B            | USN/USAF | P      | TI                 | TKC/Alliant             | TI                              |
| *Harpoon-84A/C/D      | USN      | P,O    | MDC                | TCAE                    | TI/IBM/LSI/<br>Northrop         |
| JDAM                  | USAF/USN | D      | LM/MDC             | —                       | Kearfott/Simmonds/<br>Honeywell |
| JSOW                  | USN      | D      | TI                 | —                       | Kearfott                        |
| Maverick-65A/B        | USAF     | O      | Hughes             | TKC/Aerojet             | Hughes                          |
| Maverick-65D          | USAF     | O      | Hughes/Ray         | TKC/Aerojet             | Hughes/Ray                      |
| Maverick-65E          | USMC     | O      | Hughes             | TKC/Aerojet             | Hughes                          |
| Maverick-65F          | USN      | O      | Hughes/Ray         | TKC/Aerojet             | Hughes/Ray                      |
| Shrike-45A/B          | USN/USAF | O      | NWC/PMTC           | Aerojet/<br>Alliant     | Texas<br>Instruments            |
| Sidearm 1-122A        | USMC     | O      | Motorola           | TKC/Alliant             | Motorola                        |
| SLAM-84E              | USN      | P      | MDC                | TCAE                    | MDC/Hughes/RI/HL                |
| SRAM-69A              | USAF     | O      | Boeing             | TKC/LM                  | Kearfott                        |
| Standard ARM-78D      | USN/USAF | O      | Hughes             | NOSIH                   | Hughes                          |

\* Also Surface-to-Surface

(Continued on next page)

## MAJOR MISSILE PROGRAMS (Continued)

| Program                         | Agency    | Status | Systems Contractor | Propulsion Manufacturer | Guidance Manufacturer |
|---------------------------------|-----------|--------|--------------------|-------------------------|-----------------------|
| <b>AIR-TO-SURFACE (Cont'd.)</b> |           |        |                    |                         |                       |
| Walleye 1-62                    | USN       | O      | LM                 | —                       | LM/Hughes             |
| Walleye 1ER-62                  | USN       | R,D    | NAC                | —                       | NAC                   |
| Walleye 2-62                    | USN       | O      | NAC                | —                       | NAC                   |
| Walleye 2<br>(ER/DL)-62         | USN       | O      | NAC                | —                       | NAC                   |
| WCMD                            | USAF      | D      | Alliant/TI<br>LM   | —                       | Kearfott/<br>Simmonds |
| <b>ANTI-SUBMARINE</b>           |           |        |                    |                         |                       |
| VLA-44A                         | USN       | P,O    | Loral              | TKC                     | Loral                 |
| <b>SURFACE-TO-AIR</b>           |           |        |                    |                         |                       |
| Chaparral-72A                   | Army      | O      | Loral              | Alliant/<br>Bermite     | GE/Raytheon           |
| Chaparral-72C/E/H               | Army      | O      | Loral              | ARC/Alliant             | Loral                 |
| Chaparral-72G/I                 | Army      | P,O    | Loral              | Alliant                 | Hughes/Loral          |
| PAC-3                           | Army      | D      | Loral              | ARC                     | Loral/RI/Hi           |
| Hawk-23B                        | Army      | P,O    | Raytheon           | Aerojet                 | Raytheon              |
| Patriot-104                     | Army      | P      | Raytheon           | TKC                     | Raytheon              |
| RAM-116A                        | USN       | D      | Hughes             | TKC/Alliant             | Hughes                |
| Redeye-43A                      | Army/USMC | O      | Hughes             | ARC                     | Hughes                |
| Roland-115                      | Army      | O      | Hughes/<br>Boeing  | Alliant                 | Hughes/<br>Boeing     |
| Sea Sparrow-7M                  | USN       | P,O    | Ray/Hughes         | Alliant                 | Ray/Hughes            |
| Standard 1 MR                   | USN       | P,O    | Hughes             | Aerojet/NOSIH           | Hughes/Hi             |
| Standard 2 MR                   | USN       | P,O    | Hughes             | ARC/Aerojet/TKC         | Hughes/Hi             |
| Standard 1 ER                   | USN       | O      | Hughes             | ARC/NOSIH               | Hughes/Hi             |
| Standard 2 ER                   | USN       | P,O    | Hughes/Ray         | ARC/NOSIH/TKC           | Hughes/Ray/Hi         |
| Stinger-92A                     | Army/USMC | P,O    | Hughes/Ray         | ARC                     | Hughes/Ray/Hi         |

(Continued on next page)



**MAJOR MISSILE PROGRAMS (Continued)**

| Program                                  | Agency    | Status | Systems Contractor | Propulsion Manufacturer               | Guidance Manufacturer                    |
|--|-----------|--------|--------------------|---------------------------------------|--|
| <b>SURFACE-TO-SURFACE</b>                |           |        |                    |                                       |  |
| * Harpoon-84A/C/D                        | USN       | P,O    | MDC                | TCAE/TKC                              | TI/IBM/LSI<br>NGC                        |
| Minuteman 2-30F                          | USAF      | O      | AFLC               | TKC/Aerojet/<br>Alliant               | Rockwell<br>Autonetics                   |
| Minuteman 3-30G/P                        | USAF      | O      | AFLC               | TKC/Aerojet                           | Rockwell<br>Autonetics                   |
| Peacekeeper<br>(MX)-118A                 | USAF      | O      | BMO                | TKC/Avco/RI<br>Aerojet/LM/<br>Alliant | RI/NGC/<br>Honeywell/<br>Litton          |
| Tomahawk (SLCM)                          | USN       | P      | Hughes/MDC         | WI/ARC/UTC                            | MDC/Hughes                               |
| Trident 1 (C-4)                          | USN       | O      | LM                 | Alliant/TKC                           | LM/Draper/<br>Ray/Hughes/<br>Kearfott    |
| Trident 2 (D-5)                          | USN       | P,O    | LM                 | Alliant/TKC/<br>UTC                   | LM/Draper/<br>Ray/Hughes/<br>Kearfott/RI |
| <b>BATTLEFIELD SUPPORT AND ANTIARMOR</b> |           |        |                    |                                       |  |
| ATACMS                                   | Army      | P      | Loral              | ARC                                   | —  |
| Dragon-47                                | Army      | P,O    | MDC                | MDC                                   | MDC                                      |
| HELLFIRE-114A/C/F                        | Army/USMC | P,O    | RI/LM              | Alliant/TKC                           | LM/RI                                    |
| HELLFIRE II-114K                         | Army/USMC | P,O    | LM                 | Alliant/TKC                           | —  |
| Longbow                                  | Army/USMC | D      | LM/West            | Alliant/TKC                           | LM/West                                  |
| HELLFIRE 114L                            |           |        |                    |                                       |  |
| Javelin                                  | Army/USMC | P      | TI/LM              | ARC                                   | —  |
| MLRS-26,-270                             | Army      | P,O    | Loral              | ARC                                   | —  |
| Shillelagh-51C                           | Army      | O      | Loral              | Alliant                               | Loral                                    |
| SMAW                                     | USMC      | P,O    | MDC                | MDC                                   | —  |
| TOW-71A                                  | Army      | O      | Hughes             | Alliant                               | Emerson El.                              |
| ITOW-71C                                 | Army      | P,O    | Hughes             | Alliant                               | Emerson El.                              |
| TOW2-71D                                 | Army      | P,O    | Hughes             | Alliant/TKC                           | Emerson El./TI                           |
| TOW2A-71E                                | Army      | P,O    | Hughes             | Alliant/TKC                           | Emerson El./TI                           |
| TOW2B-71F                                | Army      | P      | Hughes             | Alliant                               | Emerson El./TI                           |

Source: Aerospace Industries Association, based on company reports.

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

\* Also Air-to-Surface

|      |      |                           |       |   |      |                             |
|------|------|---------------------------|-------|---|------|-----------------------------|
| Abb: | AFLC | —Air Force Logistics Cmd. | MDC   | —McDonnell Douglas                      | Ray  | —Raytheon                   |
|      | ARC  | —Atlantic Research        | NAC   | —Naval Avionics Center                  | RI   | —Rockwell International     |
|      | BMO  | —Ballistic Missile Office | NASC  | —Naval Air Systems Command              | TCAE | —Teledyne Ryan Aeronautical |
|      | GE   | —General Electric         | NGC   | —Northrop Grumman                       | TI   | —Texas Instruments          |
|      | GEC  | —General Electric Co PLC  | NOSIH | —Naval Ordnance Station,<br>Indian Head | TKC  | —Thiokol                    |
|      | HI   | —Honeywell                | NWC   | —Naval Weapons Center                   | UTC  | —United Technologies        |
|      | LSI  | —Lear Siegler             | PMTC  | —Pacific Missile Test Center            | West | —Westinghouse               |
|      | LM   | —Lockheed Martin          |       |   | WI   | —Williams International     |

## ORDERS, SALES, AND BACKLOG MISSILE SYSTEMS AND PARTS<sup>a</sup>

Calendar Years 1977–1994  
(Millions of Dollars)

| Year              | SALES—Current Dollars | SALES—Constant Dollars <sup>b</sup> |
|-------------------|-----------------------|-------------------------------------|
| 1977              | \$ 3,118              | \$ 5,711                            |
| 1978              | 3,264 <sup>c</sup>    | 5,677                               |
| 1979 <sup>d</sup> | 3,706                 | 5,836                               |
| 1980              | 3,971                 | 5,625                               |
| 1981              | 4,662                 | 5,864                               |
| 1982              | 5,676                 | 6,457                               |
| 1983              | 5,991                 | 6,498                               |
| 1984              | 6,094                 | 6,106                               |
| 1985              | 7,975                 | 8,080                               |
| 1986              | 8,236                 | 8,253                               |
| 1987              | 9,671                 | 9,671                               |
| 1988              | 9,485                 | 9,308                               |
| 1989              | 9,283                 | 8,749                               |
| 1990              | 9,102                 | 8,237                               |
| 1991              | 8,989                 | 7,844                               |
| 1992              | 9,032                 | 7,693                               |
| 1993 <sup>r</sup> | 7,713                 | 6,385                               |
| 1994              | 5,311                 | 4,343                               |

| Year              | NET NEW ORDERS | BACKLOG AS OF<br>DECEMBER 31 |
|-------------------|----------------|------------------------------|
| 1977              | \$ 3,280       | \$ 4,541                     |
| 1978              | 2,948          | 4,581                        |
| 1979 <sup>d</sup> | 3,724          | 4,916                        |
| 1980              | 4,961          | 5,558                        |
| 1981              | 6,030          | 6,749                        |
| 1982              | 6,034          | 7,107                        |
| 1983              | 7,231          | 8,406                        |
| 1984              | 7,731          | 10,043                       |
| 1985              | 8,122          | 10,190                       |
| 1986              | 11,023         | 12,754                       |
| 1987              | 11,482         | 14,302                       |
| 1988              | 9,437          | 14,255                       |
| 1989              | 8,998          | 14,005                       |
| 1990              | 7,917          | 12,956                       |
| 1991              | 8,072          | 12,571                       |
| 1992              | 9,234          | 11,814                       |
| 1993 <sup>r</sup> | 4,775          | 9,306                        |
| 1994              | 2,816          | 5,984                        |

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

a Excludes engines and propulsion units where separable.

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

c AIA estimate based on MQ37D.

d Prior to 1980, includes space vehicle systems and parts sold to other than U.S. Government customers.

r Revised.

## BALLISTIC MISSILE DEFENSE ORGANIZATION FUNDING BY PROJECT NUMBER

Fiscal Years 1992–1996  
(Millions of Dollars)

| Project Number and Title | 1992   | 1993 | 1994 | 1995 <sup>E</sup> | 1996 <sup>E</sup> |
|--------------------------|--|------|------|-------------------|-------------------|
| 1102                     | Microwave Radar .....  | 12   | 10   | —                 | —                 |
| 1103                     | Laser Radar Technology .....                                       | 14   | —    | —                 | —                 |
| 1104                     | Signal Processing .....  | 31   | 19   | —                 | —                 |
| 1106                     | Sensor Studies & Experiments .....                                 | 168  | 285  | —                 | —                 |
| 1110                     | Sensor Integration .....   | 21   | 54   | —                 | —                 |
| 1151                     | Passive Sensors .....  | 35   | 21   | 131               | 107               |
| 1155                     | Phenomenology .....  | 86   | 86   | 87                | 78                |
| 1161                     | Advanced Sensor Technology .....                                   | —    | —    | 111               | 13                |
| 1170                     | TMD Risk Reduction .....   | —    | —    | 14                | 26                |
| 1201                     | Interceptor Component Technology .....                             | 36   | 18   | —                 | —                 |
| 1202                     | Interceptor Integration Technology .....                           | 125  | 185  | —                 | —                 |
| 1204                     | Interceptor Studies & Analysis .....                               | 11   | 8    | —                 | —                 |
| 1209                     | Endoatmospheric Interceptor Technology .....                       | 50   | 23   | —                 | —                 |
| 1212                     | D-2 HVG Projectile .....   | 6    | 10   | —                 | —                 |
| 1265                     | Boost Phase Int/Exo .....  | —    | —    | 40                | 40                |
| 1266                     | Sea-Based Theater Wide Defense .....                               | —    | —    | 81                | 68                |
| 1267                     | Ground-Based Interceptor .....                                     | —    | —    | 69                | 138               |
| 1270                     | Advanced Interceptors .....  | —    | —    | 13                | 15                |
| 1299                     | Discontinued Projects .....  | —    | —    | 20                | —                 |
| 1301                     | Free Electron Laser .....  | 22   | 14   | —                 | —                 |
| 1302                     | Chemical Laser Technology .....                                    | 99   | 12   | —                 | —                 |
| 1303                     | Neutral Particle Beam Technology .....                             | 75   | 90   | —                 | —                 |
| 1305                     | Acquisition, Tracking, Pointing & Fire<br>Control Technology ..... | 60   | 19   | —                 | —                 |
| 1307                     | Directed Energy Demonstration .....                                | —    | 21   | —                 | —                 |
| 1360                     | Directed Energy Programs .....                                     | —    | —    | 75                | 42                |
| 1405                     | Communications Engineering .....                                   | 10   | 13   | —                 | —                 |
| 1460                     | BMC3 .....   | —    | —    | 24                | 28                |
| 1501                     | Survivability Technology .....                                     | 66   | 29   | —                 | —                 |
| 1502                     | Lethality & Target Hardening .....                                 | 48   | 37   | —                 | —                 |
| 1503                     | Power & Power Conditioning .....                                   | 24   | 41   | —                 | —                 |
| 1504                     | Materials & Structures .....                                       | 28   | 22   | —                 | —                 |
| 1602,3                   | New Concepts Development .....                                     | 37   | 77   | —                 | —                 |
| 1651                     | Innovative Science & Technology .....                              | 62   | 43   | 38                | 46                |
| 1660                     | Statutory & Mandated Programs .....                                | —    | —    | 36                | 43                |
| 1700                     | Flight Test/Launch Activities .....                                | 89   | 64   | —                 | —                 |

(Continued on next page)

**BALLISTIC MISSILE DEFENSE ORGANIZATION  
FUNDING BY PROJECT NUMBER (Continued)**

Fiscal Years 1992–1996  
(Millions of Dollars)

| Project Number and Title  | 1992           | 1993           | 1994           | 1995 <sup>E</sup> | 1996 <sup>E</sup> |
|---|----------------|----------------|----------------|-------------------|-------------------|
| 2102 Space & Missile Tracking System .....                        | 74             | 210            | —              | —                 | —                 |
| 2154 TMD Ground-Based Radar .....                                 | 184            | 194            | 236            | 172               | 163               |
| 2160 TMD Existing System Modifications ....                       | —              | —              | 20             | 16                | 27                |
| 2202 Ground-Based Exoatmospheric<br>Interceptor Development ..... | 213            | 110            | —              | —                 | —                 |
| 2205 Brilliant Pebbles .....                                      | 384            | 246            | —              | —                 | —                 |
| 2208 ERINT .....  | 160            | 116            | —              | —                 | —                 |
| 2257 PATRIOT .....  | 160            | 170            | 337            | 604               | 667               |
| 2259 ACES/ADP .....   | 60             | 58             | 65             | 51                | 57                |
| 2260 THAAD .....  | 100            | 273            | 474            | 480               | 427               |
| 2262 Corps SAM .....  | 25             | 23             | 16             | 15                | 30                |
| 2263 Sea-Based Area TBMD .....                                    | 30             | 90             | 150            | 154               | 254               |
| 2300 Command Center .....   | 72             | 49             | —              | —                 | —                 |
| 2358 HAWK System BMC3 .....                                       | —              | —              | 30             | 31                | 28                |
| 3101 Engineering/Integration Support .....                        | 158            | 114            | —              | —                 | —                 |
| 3152 NMD System Engineering .....                                 | —              | —              | 41             | 20                | 19                |
| 3153 Architecture Analysis/BMC3 Initiatives ..                    | —              | —              | 12             | 12                | 12                |
| 3157 Environment, Siting, & Facilities .....                      | 12             | 6              | 8              | 6                 | 9                 |
| 3160 Readiness Planning .....                                     | —              | —              | 8              | 15                | 16                |
| 3202 Operations Interface .....                                   | 8              | 8              | —              | —                 | —                 |
| 3203 Intelligence Threat Development .....                        | 15             | 6              | —              | —                 | —                 |
| 3204 Countermeasures Integration .....                            | 17             | 21             | —              | —                 | —                 |
| 3206 System Threat .....  | 8              | 9              | —              | —                 | —                 |
| 3207 Systems Analysis .....                                       | 25             | 12             | —              | —                 | —                 |
| 3251 System Engineering & Technical Support                       | 3              | 6              | 33             | 53                | 48                |
| 3261 C4I Concepts .....   | —              | 23             | 13             | 21                | 71                |
| 3265 User Interface .....   | —              | —              | 15             | 14                | 18                |
| 3270 Threat & Countermeasures .....                               | —              | —              | 31             | 30                | 33                |
| 3300 Test & Evaluation Support .....                              | 403            | 623            | —              | —                 | —                 |
| 3352 Modeling & Simulations .....                                 | —              | —              | 109            | 87                | 86                |
| 3354 Targets Support .....  | —              | —              | 84             | 64                | 26                |
| 3359 System Test & Evaluation .....                               | —              | —              | 49             | 42                | 65                |
| 3360 Test Resources .....   | —              | —              | 39             | 44                | 46                |
| 4000 Management .....   | 247            | 481            | 219            | 167               | 186               |
| Other programs <sup>a</sup> .....                                 | 85             | 55             | —              | —                 | —                 |
| <b>TOTAL DETAILED PROJECTS .....</b>                              | <b>\$3,658</b> | <b>\$4,104</b> | <b>\$2,728</b> | <b>\$2,742</b>    | <b>\$2,913</b>    |

Source: Ballistic Missile Defense Organization, "1995 Report to the Congress on Ballistic Missile Defense" (Annually).

<sup>a</sup> Projects with five year funding under \$20 million herein combined.

<sup>E</sup> Estimate. Represents Administration's budget request.

# Space Programs

Sales of space systems, as reported by the Bureau of the Census, increased sharply in 1994 after two years of decline from a 1991 peak. The 1994 figure, which includes military, civil, and commercial programs, but does not include launch vehicle engines/motors nor spacecraft propulsion systems, was \$10.3 billion; it represented a gain of 24 percent over 1993's \$8.3 billion.

The gain was across the board, apparently compounded of industry deliveries of the first hardware components of the International Space Station, increasing commercial space activity, and continuing modernization of military orbital and ground-based space assets. Military sales totaled \$5.4 billion (up from \$4.2 billion) and non-military sales came to \$4.9 billion (up from \$4.1 billion).

The story was somewhat different in Census' report of net new orders received in 1994. Orders totaled \$8.8 billion (down from \$9.7 billion in 1993). Military orders remained close to the previous year's level; they were down to \$4.9 billion from 1993's \$5.1 billion. Non-military orders were down substantially, from \$4.6 billion in 1993 to \$3.9 billion in 1994.

The industry's backlog of orders similarly declined. At year-end 1994 it was \$13.1 billion, down

14 percent from 1993's \$15.2 billion. Here the larger decline was in backlog for military systems (\$7.1 billion, down from \$8.3 billion). The non-military backlog declined by approximately \$800 million to \$6.1 billion.

Census separately reported sales, orders, and backlog for propulsion systems but the data includes defense missile system propulsion units as well as space propulsion, and hence clouds the picture. Total sales came to \$2.6 billion, down roughly half a billion dollars. Net new orders increased from \$1.7 billion in 1993 to \$2.4 billion in 1994; the gain was entirely in the non-military area. Nonetheless, total backlog for propulsion systems continued its three-year decline, to \$6.7 billion from the previous year's \$7 billion.

The trend in federal government investment in space, on the rise for almost two decades until it declined in 1992, continued downward in 1994. Total outlays for federal space activities in Fiscal Year (FY) 1994 amounted to \$23.8 billion, down from \$27.4 billion. Reduced military activity caused the greater portion of the significant drop; military outlays, at \$11 billion, were down from \$13.8 billion. Despite increasing space station activity, National Aeronautics and Space Administration (NASA) out-

lays fell from \$13.1 billion in 1993 to \$12.4 billion in 1994.

The Department of Defense and NASA accounted for 98 percent of total outlays; other agencies spent a combined total of \$463 million (down from \$540 million). The breakdown for 1994: Commerce, \$307 million (nearly unchanged); Energy, \$82 million (down \$83 million); other agencies, \$74 million (up \$7 million).

The NASA budget plan for FY 1996 called for budget authority of

\$14.3 billion (early Congressional actions indicated the figure would be reduced by \$600-\$700 million). The plan called for \$6 billion in a new research and development category designated "Science, Aeronautics, and Technology"; \$5.5 billion in "Human Space Flight"; \$2.8 billion in "Mission Support"; and \$18 million in "Other" (release of \$400 million previously appropriated for wind tunnel modernization was pending).



**ORDERS, SALES, AND BACKLOG**  
**SPACE VEHICLE SYSTEMS<sup>a</sup>**  
**Calendar Years 1980–1994**  
**(Millions of Dollars)**

| Year              | SALES—Current Dollars |          |              | SALES—Constant Dollars <sup>b</sup> |          |              |
|-------------------|-----------------------|----------|--------------|-------------------------------------|----------|--------------|
|                   | TOTAL                 | Military | Non-Military | TOTAL                               | Military | Non-Military |
| 1980              | \$ 3,483              | \$1,461  | \$2,022      | \$ 4,933                            | \$2,069  | \$2,864      |
| 1981              | 3,856                 | 1,736    | 2,120        | 4,850                               | 2,184    | 2,667        |
| 1982              | 4,749                 | 2,606    | 2,143        | 5,403                               | 2,965    | 2,438        |
| 1983              | 4,940                 | 2,420    | 2,520        | 5,358                               | 2,625    | 2,733        |
| 1984              | 5,225                 | 3,019    | 2,206        | 5,235                               | 3,025    | 2,210        |
| 1985              | 6,300                 | 4,241    | 2,059        | 6,383                               | 4,297    | 2,086        |
| 1986              | 6,304                 | 4,579    | 1,725        | 6,317                               | 4,588    | 1,728        |
| 1987              | 8,051                 | 5,248    | 2,803        | 8,051                               | 5,248    | 2,803        |
| 1988              | 8,622                 | 6,190    | 2,432        | 8,461                               | 6,075    | 2,387        |
| 1989              | 9,758                 | 6,457    | 3,301        | 9,197                               | 6,086    | 3,111        |
| 1990              | 9,691                 | 6,556    | 3,135        | 8,770                               | 5,933    | 2,837        |
| 1991              | 10,515                | 6,770    | 3,745        | 9,175                               | 5,908    | 3,268        |
| 1992              | 9,266                 | 5,887    | 3,379        | 7,893                               | 5,014    | 2,878        |
| 1993 <sup>r</sup> | 8,309                 | 4,175    | 4,133        | 6,878                               | 3,456    | 3,421        |
| 1994              | 10,284                | 5,360    | 4,924        | 8,409                               | 4,383    | 4,026        |

| Year              | NET NEW ORDERS |          |              | BACKLOG AS OF DECEMBER 31 |          |              |
|-------------------|----------------|----------|--------------|---------------------------|----------|--------------|
|                   | TOTAL          | Military | Non-Military | TOTAL                     | Military | Non-Military |
| 1980              | \$ 3,636       | \$1,625  | \$2,011      | \$ 2,099                  | \$1,218  | \$ 881       |
| 1981              | 5,062          | 2,878    | 2,184        | 3,163                     | 2,166    | 997          |
| 1982              | 5,842          | 2,718    | 3,124        | 4,254                     | 2,277    | 1,977        |
| 1983              | 5,399          | 3,016    | 2,383        | 4,865                     | 2,733    | 2,132        |
| 1984              | 4,984          | 3,385    | 1,599        | 4,624                     | 3,099    | 1,525        |
| 1985              | 8,383          | 6,083    | 2,300        | 6,707                     | 4,941    | 1,766        |
| 1986              | 7,437          | 5,666    | 1,771        | 8,063                     | 6,028    | 2,035        |
| 1987              | 11,455         | 9,000    | 2,455        | 12,393                    | 9,460    | 2,933        |
| 1988              | 7,296          | 4,561    | 2,735        | 10,838                    | 7,880    | 2,958        |
| 1989              | 11,709         | 8,107    | 3,602        | 356                       | 9,192    | 4,164        |
| 1990              | 9,598          | 6,256    | 3,342        | 12,462                    | 8,130    | 4,332        |
| 1991              | 11,222         | 5,468    | 5,754        | 11,664                    | 6,221    | 5,443        |
| 1992              | 10,491         | 6,773    | 3,718        | 12,809                    | 7,622    | 5,187        |
| 1993 <sup>r</sup> | 9,697          | 5,106    | 4,591        | 15,203                    | 8,332    | 6,871        |
| 1994              | 8,824          | 4,896    | 3,928        | 13,139                    | 7,079    | 6,059        |

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

a Excludes engines and propulsion units where separable.

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

r Revised.

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

Calendar Years 1980–1994  
(Millions of Dollars)

| Year              | SALES—Current Dollars |          |              | SALES—Constant Dollars <sup>a</sup> |          |              |
|-------------------|-----------------------|----------|--------------|-------------------------------------|----------|--------------|
|                   | TOTAL                 | Military | Non-Military | TOTAL                               | Military | Non-Military |
| 1980              | \$ 939                | \$ 661   | \$ 278       | \$1,330                             | \$ 936   | \$ 394       |
| 1981              | 1,204                 | 786      | 418          | 1,514                               | 989      | 526          |
| 1982              | 1,555                 | 899      | 656          | 1,769                               | 1,023    | 746          |
| 1983              | 1,814                 | 951      | 863          | 1,967                               | 1,031    | 936          |
| 1984              | 2,305                 | 1,116    | 1,189        | 2,310                               | 1,118    | 1,191        |
| 1985              | 2,466                 | 1,256    | 1,210        | 2,498                               | 1,273    | 1,226        |
| 1986              | 2,995                 | 1,796    | 1,199        | 3,001                               | 1,800    | 1,201        |
| 1987              | 2,993                 | 1,563    | 1,430        | 2,993                               | 1,563    | 1,430        |
| 1988              | 3,407                 | 1,830    | 1,577        | 3,343                               | 1,796    | 1,548        |
| 1989              | 3,602                 | 1,771    | 1,831        | 3,395                               | 1,669    | 1,726        |
| 1990              | 3,247                 | 1,911    | 1,336        | 2,938                               | 1,729    | 1,209        |
| 1991              | 3,807                 | 1,869    | 1,938        | 3,322                               | 1,631    | 1,691        |
| 1992              | 3,051                 | 1,577    | 1,474        | 2,599                               | 1,343    | 1,256        |
| 1993 <sup>r</sup> | 3,104                 | 1,619    | 1,485        | 2,570                               | 1,340    | 1,229        |
| 1994              | 2,620                 | 1,130    | 1,490        | 2,142                               | 924      | 1,218        |

| Year              | NET NEW ORDERS |          |              | BACKLOG AS OF DECEMBER 31 |          |              |
|-------------------|----------------|----------|--------------|---------------------------|----------|--------------|
|                   | TOTAL          | Military | Non-Military | TOTAL                     | Military | Non-Military |
| 1980              | \$1,221        | \$ 653   | \$ 568       | \$1,284                   | \$ 871   | \$ 413       |
| 1981              | 1,284          | 746      | 538          | 1,343                     | 828      | 515          |
| 1982              | 2,112          | 1,134    | 978          | 1,901                     | 1,063    | 838          |
| 1983              | 1,618          | 942      | 676          | 1,691                     | 1,052    | 639          |
| 1984              | 3,770          | 2,258    | 1,512        | 3,156                     | 2,194    | 962          |
| 1985              | 3,823          | 1,323    | 2,500        | 4,513                     | 2,261    | 2,252        |
| 1986              | 1,985          | 1,224    | 761          | 3,503                     | 1,689    | 1,814        |
| 1987              | 3,335          | 1,995    | 1,340        | 3,849                     | 2,121    | 1,728        |
| 1988              | 3,507          | 1,623    | 1,884        | 3,985                     | 1,998    | 1,987        |
| 1989              | 6,113          | 2,475    | 3,638        | 6,410                     | 2,595    | 3,815        |
| 1990              | 2,692          | 1,891    | 801          | 6,230                     | 2,887    | 3,343        |
| 1991              | 5,661          | 1,087    | 4,574        | 8,422                     | 2,327    | 6,095        |
| 1992              | 3,124          | 2,097    | 1,027        | 8,310                     | 2,729    | 5,581        |
| 1993 <sup>r</sup> | 1,708          | 710      | 998          | 6,975                     | 1,903    | 5,072        |
| 1994              | 2,409          | 480      | 1,929        | 6,674                     | 1,253    | 5,421        |

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

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

r Revised.



**U.S. GOVERNMENT SPACECRAFT RECORD<sup>a</sup>**  
**Calendar Years 1957–1994**

| Year         | Earth Orbit <sup>b</sup> |         | Earth Escape <sup>b</sup> |                | Year              | Earth Orbit <sup>b</sup> |                | Earth Escape <sup>b</sup> |         |
|--------------|--------------------------|---------|---------------------------|----------------|-------------------|--------------------------|----------------|---------------------------|---------|
|              | Success                  | Failure | Success                   | Failure        |                   | Success                  | Failure        | Success                   | Failure |
| 1957         | —                        | 1       | —                         | —              | 1976              | 33                       | —              | 1                         | —       |
| 1958         | 5                        | 8       | —                         | 4              | 1977              | 27                       | 2              | 2                         | —       |
| 1959         | 9                        | 9       | 1                         | 2              | 1978              | 34                       | 2              | 7                         | —       |
| 1960         | 16                       | 12      | 1                         | 2              | 1979              | 18                       | —              | —                         | —       |
| 1961         | 35                       | 12      | —                         | 2              | 1980              | 16                       | 4              | —                         | —       |
| 1962         | 55                       | 12      | 4                         | 1              | 1981              | 20                       | 1              | —                         | —       |
| 1963         | 62                       | 11      | —                         | —              | 1982              | 21                       | —              | —                         | —       |
| 1964         | 69                       | 8       | 4                         | —              | 1983              | 31                       | —              | —                         | —       |
| 1965         | 93                       | 7       | 4                         | 1              | 1984              | 35                       | 3              | —                         | —       |
| 1966         | 94                       | 12      | 7                         | 1 <sup>c</sup> | 1985              | 37                       | 1              | —                         | —       |
| 1967         | 78                       | 4       | 10                        | —              | 1986              | 11                       | 4              | —                         | —       |
| 1968         | 61                       | 15      | 3                         | —              | 1987              | 9                        | 1              | —                         | —       |
| 1969         | 58                       | 1       | 8                         | 1              | 1988              | 16                       | 1              | —                         | —       |
| 1970         | 36                       | 1       | 3                         | —              | 1989              | 24                       | —              | 2                         | —       |
| 1971         | 45                       | 2       | 8                         | 1              | 1990              | 40                       | —              | 1                         | —       |
| 1972         | 33                       | 2       | 8                         | —              | 1991              | 32                       | —              | —                         | —       |
| 1973         | 23                       | 2       | 3                         | —              | 1992              | 26 <sup>d</sup>          | —              | 1                         | —       |
| 1974         | 27                       | 2       | 1                         | —              | 1993              | 28 <sup>dr</sup>         | 1 <sup>r</sup> | 1 <sup>r</sup>            | —       |
| 1975         | 30                       | 4       | 4                         | —              | 1994 <sup>f</sup> | 27 <sup>d</sup>          | 1              | 1                         | —       |
| <b>TOTAL</b> |                          |         |                           |                | <b>1,314</b>      | <b>146</b>               | <b>85</b>      | <b>15</b>                 |         |

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

- a Payloads, rather than launchings; some launches account for multiple spacecraft. Includes spacecraft from cooperating countries launched on U.S. launch vehicles.
- b The criterion of success is attainment of Earth orbit or Earth escape rather than judgement of mission success. "Escape" flights include all that were intended to go at least an altitude equal to the lunar distance from the Earth.
- c This Earth-escape failure did attain Earth orbit and therefore is included in the Earth-orbit success totals.
- d Excludes commercial satellites.
- f Through September 30.
- r Revised.

**WORLDWIDE SPACE LAUNCHINGS<sup>a</sup>  
WHICH ATTAINED EARTH ORBIT OR BEYOND**

Calendar Years 1957–1994

| Country                       | Total<br>1957–<br>1994 | 1990 | 1991            | 1992             | 1993 <sup>f</sup> | 1994 <sup>b</sup> |
|-------------------------------|------------------------|------|-----------------|------------------|-------------------|-------------------|
| <b>TOTAL</b> .....            | 3,643                  | 116  | 95 <sup>f</sup> | 100 <sup>f</sup> | 78                | 63                |
| U.S.S.R. ....                 | 2,450                  | 75   | 62              | 55               | 45                | 32                |
| United States .....           | 1,018                  | 27   | 20 <sup>f</sup> | 31 <sup>f</sup>  | 24                | 20                |
| European Space Agency .....   | 62                     | 5    | 9               | 7 <sup>f</sup>   | 7                 | 4                 |
| Japan .....                   | 48                     | 3    | 2               | 2                | 1                 | 2                 |
| People's Republic of China .. | 36                     | 5    | 1               | 3                | 1                 | 4                 |
| India .....                   | 7                      | —    | 1               | 2                | —                 | 1                 |
| Israel .....                  | 2                      | 1    | —               | —                | —                 | —                 |
| Other <sup>c</sup> .....      | 20                     | —    | —               | —                | —                 | —                 |

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

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

b Through September 30.

c Includes 10 by France, 8 by Italy (5 were U.S. spacecraft), 1 by Australia, and 1 by the United Kingdom.

f Revised.

## U.S. SPACE LAUNCH VEHICLES

As of 1994

| Vehicle and Initial Launch & First Launch of this Modification | Stages   | Thrust (Kilo-newtons) | Maximum Payload (Kg) <sup>a</sup>       |                           |                           |
|--|--|-----------------------|---|---------------------------|---------------------------|
|  |  |                       | 185-Km Orbit                            | Geo-synch.-Transfer Orbit | Circular Sun-Synch. Orbit |
| Pegasus (1990)   | 1. Orion 50S*                                  | 484.9                 | 380                                     | —                         | 210                       |
|  | 2. Orion 50*                                   | 118.2                 | 280 <sup>b</sup>                        |                           |                           |
|  | 3. Orion 38*                                   | 31.9                  |   |                           |                           |
| Pegasus XL (1994) <sup>z</sup>                                 | 1. Orion 50S-XL*                               | 743.3                 | 460                                     | —                         | 335                       |
|  | 2. Orion 50-XL*                                | 201.5                 | 350 <sup>b</sup>                        |                           |                           |
|  | 3. Orion 38*                                   | 31.9                  |   |                           |                           |
| Taurus (1994)  | 0. Castor 120*                                 | 1,687.7               | 1,400                                   | 255                       | 1,020                     |
|  | 1. Orion 50S*                                  | 580.5                 | 1,080 <sup>b</sup>                      |                           |                           |
|  | 2. Orion 50*                                   | 138.6                 |   |                           |                           |
|  | 3. Orion 38*                                   | 31.9                  |   |                           |                           |
| Delta II 7900 Series (1960; 1990)                              | 1. RS-27A plus 9 Hercules GEM*                 | 1,043.0               | 5,089                                   | 1,842 <sup>c</sup>        | 3,175                     |
|  |  | 4,388.4               | 3,890 <sup>b</sup>                      |                           |                           |
|  | 2. AJ10-118K                                   | 42.9                  |   |                           |                           |
| Atlas E (1958; 1968)   | 1. Atlas booster & sustainer                   | 1,739.5               | 820 <sup>b</sup><br>1,860 <sup>bd</sup> | —<br>—                    | —<br>910 <sup>d</sup>     |
|  | 2. 2 Centaur I                                 | 146.8                 |   |                           |                           |
| Atlas I (1966; 1990)   | 1. Atlas booster & sustainer                   | 1,952.0               | —                                       | 2,255                     | —                         |
|  | 2. 2 Centaur I                                 | 146.8                 |   |                           |                           |
| Atlas II (1966; 1991)  | 1. Atlas booster & sustainer                   | 2,110.0               | 6,580                                   | 2,610                     | 4,300                     |
|  | 2. 2 Centaur II                                | 146.8                 | 5,510 <sup>b</sup>                      |                           |                           |
| Atlas IIA (1966; 1992)   | 1. Atlas booster & sustainer                   | 2,110.0               | 7,280                                   | 3,039                     | 4,750                     |
|  | 2. 2 Centaur II                                | 185.0                 | 6,170 <sup>b</sup>                      |                           |                           |
| Atlas IIAS (1966; 1994)  | 1. Atlas booster & sustainer plus 4 Castor IV* | 2,110.0               | 8,640                                   | 3,606                     | 5,800                     |
|  | 2. 2 Centaur II                                | 1,913.2<br>185.0      | 7,300 <sup>b</sup>                      |                           |                           |

(Continued on next page)

## U.S. SPACE LAUNCH VEHICLES

As of 1994 (Continued)

| Vehicle and Initial Launch & First Launch of this Modification | Stages  | Thrust (Kilo-newtons) | Maximum Payload (Kg) <sup>2</sup> |                     |                           |
|--|---|-----------------------|-----------------------------------|---------------------|---------------------------|
|  |   |                       | 185-Km Orbit                      | 24-Hour Polar Orbit | Circular Sun-Synch. Orbit |
| Titan II (1964; 1988)  | 1. 2 LR-87  | 2,090.0               | 1,905 <sup>b</sup>                | —                   | —                         |
|  | 2. LR-91  | 440.0                 |                                   |                     |                           |
| Titan III (1964; 1989)   | 0. 2 5 1/2-segment, 3.05-m. dia*  | 12,420.0              | 14,515                            | 5,000 <sup>f</sup>  | —                         |
|  | 1. 2 LR-87  | 2,429.0               |                                   |                     |                           |
|  | 2. LR-91  | 462.8                 |                                   |                     |                           |
| Titan IV (1989)  | 0. 2 7-segment, 3.05-m. dia*  | 14,000.0              | 17,700                            | 6,350 <sup>f</sup>  | —                         |
|  | 1. 2 LR-87  | 2,429.0               |                                   |                     |                           |
|  | 2. LR-91  | 462.8                 |                                   |                     |                           |
|  | 3. Centaur  | 73.4                  |                                   |                     |                           |
| Titan IV/Centaur (1994)  | 0. 7-segment, 4.3-m. dia*   | 7,000.0               | —                                 | 5,760               | —                         |
|  | 1. LR-87  | 1,214.5               |                                   |                     |                           |
|  | 2. LR-91  | 462.8                 |                                   |                     |                           |
|  | 3. Centaur  | 73.4                  |                                   |                     |                           |
| Space Shuttle (reusable) (1981)                                | 1. 3 main engines (SSMEs) fire in parallel with solid-fueled rocket boosters (SRBs) | 5,006.1               | 24,900 <sup>g</sup>               | 5,900 <sup>h</sup>  | —                         |
|  | 2. 2 SRBs mounted on external tank (ET) fire in parallel with SSMEs                 | 23,580.0              |                                   |                     |                           |

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

- \* Solid propellant; all others are liquid.
- a Due east launch except as indicated.
- b Polar launch.
- c With Star 48B.
- d With TE-M-364-4 upper stage.
- f With appropriate upper stage.
- g In full performance configuration (280–420 km orbit).
- h With IUS or TOS.
- z First launch was a failure.

## FEDERAL SPACE ACTIVITIES OUTLAYS

Fiscal Years 1961–1994  
(Millions of Current Dollars)

| Year              | TOTAL               | NASA <sup>a</sup> | DoD    | Energy | Commerce | Other <sup>b</sup> |
|-------------------|---------------------|-------------------|--------|--------|----------|--------------------|
| 1961              | \$ 1,468            | \$ 694            | \$ 710 | \$ 64  | \$ —     | \$ —               |
| 1962              | 2,387               | 1,226             | 1,029  | 130    | 1        | 1                  |
| 1963              | 4,079               | 2,517             | 1,368  | 181    | 12       | 1                  |
| 1964              | 5,930               | 4,131             | 1,564  | 220    | 12       | 3                  |
| 1965              | 6,886               | 5,035             | 1,592  | 232    | 24       | 3                  |
| 1966              | 7,719               | 5,858             | 1,637  | 188    | 28       | 7                  |
| 1967              | 7,237               | 5,337             | 1,673  | 184    | 39       | 5                  |
| 1968              | 6,667               | 4,595             | 1,890  | 147    | 29       | 6                  |
| 1969              | 6,326               | 4,078             | 2,095  | 118    | 31       | 5                  |
| 1970              | 5,453               | 3,565             | 1,756  | 103    | 24       | 5                  |
| 1971              | 4,999               | 3,171             | 1,693  | 97     | 30       | 8                  |
| 1972              | 4,772               | 3,195             | 1,470  | 60     | 37       | 10                 |
| 1973              | 4,719               | 3,069             | 1,557  | 51     | 29       | 13                 |
| 1974              | 4,854               | 2,960             | 1,777  | 39     | 64       | 14                 |
| 1975              | 4,891               | 2,951             | 1,831  | 34     | 64       | 11                 |
| 1976              | 5,314               | 3,336             | 1,864  | 26     | 71       | 16                 |
| Tr.Qtr.           | 1,361               | 869               | 458    | 8      | 23       | 4                  |
| 1977              | 5,559               | 3,600             | 1,833  | 22     | 87       | 18                 |
| 1978              | 6,188               | 3,582             | 2,457  | 29     | 101      | 20                 |
| 1979              | 6,808               | 3,744             | 2,892  | 55     | 97       | 21                 |
| 1980              | 7,668               | 4,340             | 3,162  | 49     | 89       | 28                 |
| 1981              | 9,166               | 4,877             | 4,131  | 47     | 81       | 30                 |
| 1982              | 10,466              | 5,463             | 4,772  | 60     | 142      | 30                 |
| 1983              | 12,590              | 6,101             | 6,247  | 40     | 178      | 25                 |
| 1984              | 14,726              | 6,461             | 8,000  | 33     | 209      | 22                 |
| 1985              | 17,255              | 6,607             | 10,441 | 34     | 155      | 17                 |
| 1986              | 18,581              | 6,756             | 11,449 | 35     | 317      | 25                 |
| 1987              | 21,844              | 7,254             | 14,264 | 37     | 262      | 26                 |
| 1988              | 23,414              | 8,451             | 14,397 | 199    | 334      | 33                 |
| 1989              | 25,143              | 10,195            | 14,504 | 97     | 306      | 41                 |
| 1990              | 25,671              | 12,292            | 12,962 | 3      | 279      | 60                 |
| 1991              | 28,360              | 13,351            | 14,432 | 251    | 266      | 60                 |
| 1992              | 27,865 <sup>r</sup> | 12,838            | 14,437 | 223    | 298      | 69 <sup>r</sup>    |
| 1993              | 27,411              | 13,092            | 13,779 | 165    | 308      | 67                 |
| 1994 <sup>E</sup> | 23,799              | 12,363            | 10,973 | 82     | 307      | 74                 |

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

NOTE: Detail may not add to totals because of rounding.

a Excludes amounts for air transportation.

b Departments of Interior and Agriculture, and the National Science Foundation. NSF funding transferred to NASA after 1982.

E Estimated.

r Revised.

Tr.Qtr. See Glossary.

## FEDERAL SPACE ACTIVITIES OUTLAYS IN CONSTANT DOLLARS

Fiscal Years 1961–1994  
(Millions of Constant Dollars<sup>a</sup>)

| Year              | TOTAL               | NASA <sup>b</sup>   | DoD                 | Energy | Commerce | Other <sup>c</sup> |
|-------------------|---------------------|---------------------|---------------------|--------|----------|--------------------|
| 1961              | \$ 5,584            | \$ 2,640            | \$ 2,701            | \$243  | \$ —     | \$ —               |
| 1962              | 8,910               | 4,576               | 3,840               | 485    | 4        | 3                  |
| 1963              | 14,973              | 9,239               | 5,020               | 664    | 45       | 4                  |
| 1964              | 21,454              | 14,947              | 5,657               | 796    | 45       | 9                  |
| 1965              | 24,358              | 17,810              | 5,631               | 821    | 85       | 11                 |
| 1966              | 26,551              | 20,151              | 5,633               | 648    | 97       | 23                 |
| 1967              | 24,076              | 17,753              | 5,566               | 611    | 128      | 18                 |
| 1968              | 21,369              | 14,729              | 6,058               | 470    | 93       | 18                 |
| 1969              | 19,293              | 12,437              | 6,389               | 358    | 95       | 14                 |
| 1970              | 15,774              | 10,313              | 5,080               | 297    | 69       | 15                 |
| 1971              | 13,756              | 8,726               | 4,659               | 268    | 82       | 22                 |
| 1972              | 12,482              | 8,357               | 3,845               | 156    | 98       | 26                 |
| 1973              | 11,734              | 7,632               | 3,871               | 127    | 73       | 31                 |
| 1974              | 11,218              | 6,842               | 4,107               | 90     | 148      | 32                 |
| 1975              | 10,279              | 6,202               | 3,848               | 72     | 134      | 23                 |
| 1976              | 10,375              | 6,514               | 3,640               | 50     | 139      | 32                 |
| Tr. Qtr.          | 2,553               | 1,630               | 859                 | 15     | 43       | 8                  |
| 1977              | 10,038              | 6,500               | 3,309               | 40     | 157      | 32                 |
| 1978              | 10,388              | 6,014               | 4,125               | 48     | 169      | 33                 |
| 1979              | 10,516              | 5,783               | 4,467               | 84     | 150      | 32                 |
| 1980              | 10,864              | 6,149               | 4,480               | 69     | 126      | 39                 |
| 1981              | 11,787              | 6,272               | 5,312               | 60     | 104      | 39                 |
| 1982              | 12,527              | 6,539               | 5,711               | 71     | 170      | 35                 |
| 1983              | 14,468              | 7,011               | 7,178               | 46     | 205      | 29                 |
| 1984              | 16,209              | 7,112               | 8,806               | 37     | 230      | 25                 |
| 1985              | 18,294              | 7,005               | 11,070              | 36     | 165      | 18                 |
| 1986              | 19,132              | 6,956               | 11,788              | 36     | 326      | 26                 |
| 1987              | 21,844              | 7,254               | 14,264              | 37     | 262      | 26                 |
| 1988              | 22,594              | 8,154               | 13,893              | 192    | 322      | 32                 |
| 1989              | 23,231              | 9,420               | 13,401              | 90     | 283      | 38                 |
| 1990              | 22,921              | 10,975              | 11,573              | 71     | 249      | 54                 |
| 1991              | 24,302 <sup>r</sup> | 11,440 <sup>r</sup> | 12,367 <sup>r</sup> | 215    | 228      | 51                 |
| 1992 <sup>r</sup> | 23,201              | 10,689              | 12,021              | 186    | 248      | 57                 |
| 1993              | 22,285              | 10,644              | 11,202              | 134    | 250      | 54                 |
| 1994 <sup>E</sup> | 18,978              | 9,859               | 8,750               | 65     | 245      | 59                 |

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

NOTE: Detail may not add to totals because of rounding.

a Based on fiscal year GDP implicit price deflator, 1987 = 100.

b Excludes amounts for air transportation.

c Departments of Interior and Agriculture, and the National Science Foundation. NSF funding transferred to NASA after 1982.

E Estimated.

r Revised.

Tr. Qtr. See Glossary.

## FEDERAL SPACE ACTIVITIES BUDGET AUTHORITY

Fiscal Years 1961–1994

(Millions of Dollars)

| Year              | TOTAL                 | NASA <sup>a</sup> | DoD    | Energy          | Commerce | Other <sup>b</sup> |
|-------------------|-----------------------|-------------------|--------|-----------------|----------|--------------------|
| 1961              | \$ 1,809 <sup>r</sup> | \$ 926            | \$ 814 | \$ 68           | \$ —     | \$ 1               |
| 1962              | 3,295                 | 1,797             | 1,298  | 148             | 51       | 1                  |
| 1963              | 5,435                 | 3,626             | 1,550  | 214             | 43       | 2                  |
| 1964              | 6,831                 | 5,016             | 1,599  | 210             | 3        | 3                  |
| 1965              | 6,956                 | 5,138             | 1,574  | 229             | 12       | 3                  |
| 1966              | 6,971 <sup>r</sup>    | 5,065             | 1,689  | 187             | 27       | 3                  |
| 1967              | 6,710                 | 4,830             | 1,664  | 184             | 29       | 3                  |
| 1968              | 6,529                 | 4,430             | 1,922  | 145             | 28       | 4                  |
| 1969              | 5,976                 | 3,822             | 2,013  | 118             | 20       | 3                  |
| 1970              | 5,340 <sup>r</sup>    | 3,547             | 1,678  | 103             | 8        | 4                  |
| 1971              | 4,741                 | 3,101             | 1,512  | 95              | 27       | 5                  |
| 1972              | 4,575                 | 3,071             | 1,407  | 55              | 31       | 11 <sup>r</sup>    |
| 1973              | 4,825                 | 3,093             | 1,623  | 54              | 40       | 15                 |
| 1974              | 4,640                 | 2,759             | 1,766  | 42              | 60       | 14                 |
| 1975              | 4,914                 | 2,915             | 1,892  | 30              | 64       | 12 <sup>r</sup>    |
| 1976              | 5,320                 | 3,225             | 1,983  | 23              | 72       | 16                 |
| Tr. Qtr.          | 1,341                 | 849               | 460    | 5               | 22       | 5 <sup>r</sup>     |
| 1977              | 5,983                 | 3,440             | 2,412  | 22              | 91       | 18                 |
| 1978              | 6,518                 | 3,623             | 2,738  | 34              | 103      | 20                 |
| 1979              | 7,244                 | 4,030             | 3,036  | 59              | 98       | 20 <sup>r</sup>    |
| 1980              | 8,689                 | 4,680             | 3,848  | 40              | 93       | 28                 |
| 1981              | 9,978                 | 4,992             | 4,828  | 41              | 87       | 30                 |
| 1982              | 12,441                | 5,528             | 6,679  | 61              | 145      | 29                 |
| 1983              | 15,589                | 6,328             | 9,019  | 39              | 178      | 25                 |
| 1984              | 17,136                | 6,648             | 10,195 | 34              | 236      | 22                 |
| 1985              | 20,167                | 6,925             | 12,768 | 34              | 423      | 17                 |
| 1986              | 21,659                | 7,165             | 14,126 | 35              | 309      | 25                 |
| 1987              | 26,448                | 9,809             | 16,287 | 48              | 278      | 28 <sup>r</sup>    |
| 1988              | 26,607                | 8,302             | 17,679 | 241             | 352      | 32 <sup>r</sup>    |
| 1989              | 28,448 <sup>r</sup>   | 10,098            | 17,906 | 97              | 301      | 46 <sup>r</sup>    |
| 1990              | 28,145 <sup>r</sup>   | 12,142            | 15,616 | 7 <sup>r</sup>  | 243      | 65 <sup>r</sup>    |
| 1991              | 27,783 <sup>r</sup>   | 13,036            | 14,181 | 25 <sup>r</sup> | 251      | 64 <sup>r</sup>    |
| 1992              | 28,845 <sup>r</sup>   | 13,199            | 15,023 | 223             | 327      | 74 <sup>r</sup>    |
| 1993              | 27,742                | 13,077            | 14,106 | 165             | 324      | 70                 |
| 1994 <sup>E</sup> | 26,653                | 13,022            | 13,166 | 78              | 312      | 75                 |

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

NOTE: Detail may not add to totals because of rounding.

a Excludes amounts for air transportation.

b Departments of Interior and Agriculture, and the National Science Foundation, and the Environmental Protection Agency. NSF funding transferred to NASA after 1982.

E Estimated.

r Revised.

Tr. Qtr. See Glossary.

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION BUDGET AUTHORITY

Fiscal Years 1968–1996  
(Millions of Current Dollars)

| Year               | TOTAL    | Research<br>and<br>Development           | Space Flight<br>Control and<br>Data Commu-<br>nications <sup>a</sup> | Construc-<br>tion of<br>Facilities | Research &<br>Program<br>Management <sup>b</sup> |
|--------------------|----------|--|--|------------------------------------|--|
| 1968               | \$ 4,589 | \$3,912                                  | \$ —   | \$ 38                              | \$ 639   |
| 1969               | 3,995    | 3,314                                    | —  | 33                                 | 648  |
| 1970               | 3,749    | 2,993                                    | —  | 53                                 | 703  |
| 1971               | 3,312    | 2,556                                    | —  | 26                                 | 730  |
| 1972               | 3,308    | 2,523                                    | —  | 53                                 | 732  |
| 1973               | 3,408    | 2,599                                    | —  | 79                                 | 730  |
| 1974               | 3,040    | 2,194                                    | —  | 101                                | 745  |
| 1975               | 3,231    | 2,323                                    | —  | 143                                | 765  |
| 1976               | 3,552    | 2,678                                    | —  | 82                                 | 792  |
| Tr. Qtr.           | 932      | 700                                      | —  | 11                                 | 221  |
| 1977               | 3,819    | 2,856                                    | —  | 118                                | 845  |
| 1978               | 4,064    | 3,012                                    | —  | 162                                | 890  |
| 1979               | 4,559    | 3,477                                    | —  | 148                                | 934  |
| 1980               | 5,243    | 4,088                                    | —  | 159                                | 996  |
| 1981               | 5,522    | 4,334                                    | —  | 117                                | 1,071  |
| 1982               | 6,020    | 4,772                                    | —  | 114                                | 1,134  |
| 1983               | 6,875    | 5,539                                    | —  | 139                                | 1,197  |
| 1984               | 7,316    | 2,064 <sup>a</sup>                       | 3,772  | 223                                | 1,256  |
| 1985               | 7,573    | 2,468                                    | 3,594  | 178                                | 1,332  |
| 1986               | 7,807    | 2,619                                    | 3,670  | 176                                | 1,342  |
| 1987               | 10,923   | 3,154                                    | 6,100  | 217                                | 1,453  |
| 1988               | 9,062    | 3,280                                    | 3,806  | 213                                | 1,763  |
| 1989               | 10,969   | 4,213                                    | 4,555  | 275                                | 1,927  |
| 1990               | 12,324   | 5,225                                    | 4,645  | 218                                | 2,023  |
| 1991               | 14,016   | 6,024                                    | 5,271  | 498                                | 2,212  |
| 1992               | 14,317   | 6,848                                    | 5,352  | 525                                | 1,576  |
| 1993               | 14,310   | 7,074                                    | 5,059  | 526                                | 1,652  |
| 1994               | 14,570   | 7,534                                    | 4,835  | 493                                | 1,708  |
| Year               | TOTAL    | Science,<br>Aeronautics,<br>& Technology | Human<br>Space<br>Flight   | Other <sup>b</sup>                 | Mission<br>Support                               |
| 1995 <sup>CE</sup> | \$14,438 | \$5,961                                  | \$5,515  | \$389                              | \$2,572  |
| 1996 <sup>E</sup>  | 14,261   | 6,007                                    | 5,510  | 18                                 | 2,726  |

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

NOTE: Detail may not add to totals because of rounding.

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

b Includes trust funds, Office of the Inspector General, & GSA building delegation.

c 1995 features major budget account restructuring.

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

Tr. Qtr. See Glossary.



## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION OUTLAYS

Fiscal Years 1968–1996  
(Millions of Current Dollars)

| Year               | TOTAL    | Research and Development | Space Flight Control and Data Communications <sup>a</sup> | Construction of Facilities | Research & Program Management <sup>b</sup> |
|--------------------|----------|--------------------------|---|----------------------------|--|
| 1968               | \$ 4,724 | \$3,946                  | \$ —  | \$126                      | \$ 652                                     |
| 1969               | 4,252    | 3,530                    | —   | 65                         | 656  |
| 1970               | 3,753    | 2,992                    | —   | 54                         | 707  |
| 1971               | 3,382    | 2,630                    | —   | 44                         | 708  |
| 1972               | 3,423    | 2,623                    | —   | 50                         | 749  |
| 1973               | 3,315    | 2,541                    | —   | 45                         | 729  |
| 1974               | 3,256    | 2,422                    | —   | 75                         | 760  |
| 1975               | 3,267    | 2,420                    | —   | 85                         | 761  |
| 1976               | 3,669    | 2,749                    | —   | 121                        | 799  |
| Tr.Qtr.            | 951      | 731                      | —   | 26                         | 195  |
| 1977               | 3,945    | 2,980                    | —   | 105                        | 860  |
| 1978               | 3,983    | 2,989                    | —   | 124                        | 870  |
| 1979               | 4,197    | 3,139                    | —   | 133                        | 925  |
| 1980               | 4,852    | 3,701                    | —   | 140                        | 1,010                                      |
| 1981               | 5,421    | 4,223                    | —   | 147                        | 1,051                                      |
| 1982               | 6,035    | 4,796                    | —   | 109                        | 1,130                                      |
| 1983               | 6,664    | 5,316                    | —   | 108                        | 1,240                                      |
| 1984               | 7,048    | 2,792 <sup>a</sup>       | 2,915   | 109                        | 1,232                                      |
| 1985               | 7,318    | 2,118                    | 3,707   | 170                        | 1,323                                      |
| 1986               | 7,404    | 2,615                    | 3,267   | 189                        | 1,332                                      |
| 1987               | 7,591    | 2,436                    | 3,597   | 149                        | 1,409                                      |
| 1988               | 9,092    | 2,916                    | 4,362   | 166                        | 1,648                                      |
| 1989               | 11,052   | 3,922                    | 5,030   | 190                        | 1,909                                      |
| 1990               | 12,429   | 5,094                    | 5,117   | 218                        | 2,000                                      |
| 1991               | 13,878   | 5,765                    | 5,590   | 326                        | 2,196                                      |
| 1992               | 13,961   | 6,579                    | 5,118   | 463                        | 1,802                                      |
| 1993               | 14,306   | 7,086                    | 5,025   | 557                        | 1,638                                      |
| 1994               | 13,695   | 6,758                    | 4,899   | 371                        | 1,666                                      |
| 1995 <sup>cE</sup> | 5,804    | 3,532                    | 1,614   | 537                        | 121  |
| 1996 <sup>cE</sup> | 811      | 460                      | 199   | 144                        | 8  |

| Year               | TOTAL    | Science, Aeronautics, & Technology | Human Space Flight | Other <sup>b</sup> | Mission Support |
|--------------------|----------|------------------------------------|--------------------|--------------------|-----------------|
| 1995 <sup>cE</sup> | \$ 8,436 | \$2,911                            | \$3,432            | \$ 16              | \$2,077         |
| 1996 <sup>cE</sup> | 13,316   | 5,311                              | 5,431              | 19                 | 2,555           |

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

NOTE: Detail may not add to totals because of rounding.

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

b Includes trust funds, Office of Inspector General, & GSA building delegation.

c 1995 featured major budget account restructuring. Note: 1995 and 1996 outlays split between old and new account structure.

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

Tr.Qtr. See Glossary.

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION OUTLAYS IN CONSTANT DOLLARS

Fiscal Years 1968–1996  
(Millions of Constant Dollars<sup>a</sup>)

| Year               | TOTAL    | Research and Development | Space Flight Control and Data Communications <sup>b</sup> | Construction of Facilities | Research & Program Management <sup>c</sup> |
|--------------------|----------|--------------------------|---|----------------------------|--|
| 1968               | \$15,141 | \$12,647                 | \$ —  | \$404                      | \$2,090                                    |
| 1969               | 12,967   | 10,765                   | —   | 198                        | 2,001                                      |
| 1970               | 10,856   | 8,655                    | —   | 156                        | 2,045                                      |
| 1971               | 9,307    | 7,237                    | —   | 121                        | 1,948                                      |
| 1972               | 8,954    | 6,861                    | —   | 131                        | 1,959                                      |
| 1973               | 8,242    | 6,318                    | —   | 112                        | 1,813                                      |
| 1974               | 7,525    | 5,597                    | —   | 173                        | 1,756                                      |
| 1975               | 6,866    | 5,086                    | —   | 179                        | 1,599                                      |
| 1976               | 7,163    | 5,367                    | —   | 236                        | 1,560                                      |
| Tr.Qtr.            | 1,784    | 1,371                    | —   | 49                         | 366  |
| 1977               | 7,124    | 5,381                    | —   | 190                        | 1,553                                      |
| 1978               | 6,686    | 5,018                    | —   | 208                        | 1,460                                      |
| 1979               | 6,483    | 4,849                    | —   | 205                        | 1,429                                      |
| 1980               | 6,874    | 5,244                    | —   | 198                        | 1,431                                      |
| 1981               | 6,971    | 5,431                    | —   | 189                        | 1,352                                      |
| 1982               | 7,223    | 5,740                    | —   | 130                        | 1,352                                      |
| 1983               | 7,658    | 6,109                    | —   | 124                        | 1,425                                      |
| 1984               | 7,758    | 3,073 <sup>b</sup>       | 3,209   | 120                        | 1,356                                      |
| 1985               | 7,759    | 2,246                    | 3,930   | 180                        | 1,403                                      |
| 1986               | 7,624    | 2,693                    | 3,364   | 195                        | 1,371                                      |
| 1987               | 7,591    | 2,436                    | 3,597   | 149                        | 1,409                                      |
| 1988               | 8,774    | 2,814                    | 4,209   | 160                        | 1,590                                      |
| 1989               | 10,212   | 3,624                    | 4,648   | 176                        | 1,764                                      |
| 1990               | 11,097   | 4,548                    | 4,569   | 195                        | 1,786                                      |
| 1991 <sup>r</sup>  | 11,892   | 4,940                    | 4,790   | 279                        | 1,882                                      |
| 1992 <sup>r</sup>  | 11,624   | 5,478                    | 4,261   | 386                        | 1,500                                      |
| 1993 <sup>r</sup>  | 11,631   | 5,761                    | 4,085   | 453                        | 1,332                                      |
| 1994               | 10,921   | 5,389                    | 3,907   | 296                        | 1,329                                      |
| 1995 <sup>dE</sup> | 4,506    | 2,742                    | 1,253   | 417                        | 94   |
| 1996 <sup>dE</sup> | 612      | 347                      | 150   | 109                        | 6  |

| Year               | TOTAL    | Science, Aeronautics, & Technology | Human Space Flight | Other <sup>c</sup> | Mission Support |
|--------------------|----------|------------------------------------|--------------------|--------------------|-----------------|
| 1995 <sup>dE</sup> | \$ 6,550 | \$ 2,260                           | \$2,665            | \$ 12              | \$1,613         |
| 1996 <sup>dE</sup> | 10,042   | 4,005                              | 4,096              | 14                 | 1,927           |

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

NOTE: Detail may not add to totals because of rounding.

a Based on fiscal year GDP implicit price deflator, (1987=100).

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

c Includes trust funds, Office of Inspector General, & GSA building delegation.

d 1995 featured major budget account restructuring. Note: 1995 and 1996 outlays split between old and new account structure.

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

r Revised.

Tr.Qtr. See Glossary.

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

Fiscal Years 1995–1996  
(Millions of Dollars)

|  | 1995 <sup>E</sup> | 1996 <sup>E</sup> |
|--|-------------------|-------------------|
| <b>HUMAN SPACE FLIGHT</b> .....                                  | \$5,515           | \$5,510           |
| <b>Space Station</b> .....                                       | \$1,890           | \$1,834           |
| <b>U.S.-Russian Cooperative Space Activities</b> .....           | 150               | 129               |
| <b>Space Shuttle—Total</b> .....                                 | <u>3,155</u>      | <u>3,232</u>      |
| Shuttle Operations .....   | 2,415             | 2,395             |
| Safety & Obsolescence Upgrades .....                             | 740               | 837               |
| <b>Payload &amp; Utilization Operations</b> .....                | 320               | 315               |
| <b>SCIENCE, AERONAUTICS, &amp; TECHNOLOGY</b> .....              | \$5,944           | \$6,007           |
| <b>Space Science—Total</b> .....                                 | <u>\$2,013</u>    | <u>\$1,959</u>    |
| Physics & Astronomy .....  | 1,196             | 1,131             |
| Planetary Exploration .....                                      | 817               | 828               |
| <b>Life &amp; Microgravity Sciences &amp; Applications</b> ..... | 483               | 504               |
| <b>Mission To Planet Earth</b> .....                             | 1,340             | 1,341             |
| <b>Space Access &amp; Technology</b> .....                       | 642               | 706               |
| <b>Aeronautical Research &amp; Technology</b> .....              | 882               | 917               |
| <b>Mission Communication Services</b> .....                      | 481               | 461               |
| <b>Academic Programs</b> .....                                   | 102               | 119               |
| <b>MISSION SUPPORT</b> .....                                     | \$2,589           | \$2,726           |
| <b>Safety, Reliability, &amp; Quality Assurance</b> .....        | \$ 39             | \$ 38             |
| <b>Space Communication Services</b> .....                        | 227               | 319               |
| <b>Research &amp; Program Management</b> .....                   | 2,189             | 2,203             |
| <b>Construction of Facilities</b> .....                          | 135               | 166               |

Source: "NASA Budget Briefing Background Material" (Annually).

Note: Detail may not add to totals because of rounding.

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

**DEPARTMENT OF DEFENSE SPACE PROGRAMS  
PROCUREMENT (INCLUDING INITIAL SPARES) AND RDT&E**  
Fiscal Years 1994, 1995, and 1996  
(Millions of Dollars<sup>a</sup>)

| Agency and Program        | 1994                  |         | 1995 <sup>E</sup>     |         | 1996 <sup>E</sup>     |         |
|---------------------------|-----------------------|---------|-----------------------|---------|-----------------------|---------|
|                           | Pro-<br>cure-<br>ment | RDT&E   | Pro-<br>cure-<br>ment | RDT&E   | Pro-<br>cure-<br>ment | RDT&E   |
| <b>AIR FORCE</b>          |                       |         |                       |         |                       |         |
| DSCS <sup>b</sup> .....   | \$101.5               | \$ 19.9 | \$133.5               | \$ 46.4 | \$115.1               | \$ 51.7 |
| Defense Support Program . | 350.3                 | 46.9    | 361.4                 | 66.1    | 102.9                 | 43.7    |
| Medium Launch Vehicle .   | 109.5                 | 69.5    | 135.1                 | 20.5    | 189.8                 | 21.9    |
| Milstar .....             | —                     | 904.0   | —                     | 616.2   | —                     | 692.3   |
| NAVSTAR GPS .....         | 160.0                 | 36.8    | 188.8                 | 36.0    | 174.5                 | 46.6    |
| Space Boosters .....      | 463.2                 | 263.5   | 379.1                 | 150.9   | 465.0                 | 140.5   |
| <b>NAVY</b>               |                       |         |                       |         |                       |         |
| FSC .....                 | \$167.1               | NA      | \$124.6               | \$ 20.6 | \$ 51.8               | \$ 21.0 |

Source: Department of Defense, "Program Acquisition Costs by Weapon System" (Annually).

a Total Obligational Authority.

b Army and Air Force funding.

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

NA Not available.

KEY: DSCS = Defense Satellite Communications System

FSC = Fleet Satellite Communications

GPS = Global Positioning System

# Air Transportation

The financial problems that had plagued the world's airlines for several years lessened in 1994 as traffic and revenues increased substantially, but they were not eliminated. The net result for the world scheduled airline members of the International Civil Aviation Organization (ICAO) was a loss of \$500 million, although the loss was small in comparison with the earlier years of the 1990s.

The combined losses of ICAO members in 1994 were due to factors not directly related to ticket sales and flight operations, but principally to interest costs for servicing the huge debts incurred by many airlines in the recession years. From the standpoint of operating results, both ICAO carriers and U.S. airlines posted significant gains in operating profits.

The U.S. scheduled airlines recorded an operating profit of \$2.8 billion in 1994, almost double that of the previous year (a turnaround year after three years in which aggregate operating losses topped \$6 billion). Total revenues were \$87.4 billion, up from \$84.6 billion in 1993. Domestic operations accounted for almost 75 percent of the revenue (\$65.3 billion) and 83 percent of the

profit (\$2.3 billion). International service by U.S. carriers produced an operating profit of \$476 million on revenues of \$22.1 billion.

The world's airlines had an operating profit of \$8 billion on revenues of \$247.5 billion, according to ICAO data, compared with \$2.3 billion profit in 1993.

U.S. airlines experienced traffic gains in both domestic and international operations. In 1994, scheduled U.S. carriers flew a record 67.9 billion revenue ton-miles, up from 63.1 billion. Passenger traffic accounted for 51.9 billion revenue ton-miles (up from 49 billion) and cargo traffic 16 billion (up from 14.1 billion). The total revenue load factor was 56.3 percent (up from 54.6 percent).

In domestic service, the U.S.



---

scheduled airlines boarded more than 481 million passengers, up from 443 million in the previous year. Revenue passenger miles totaled 378.8 billion (up from 354.2 billion). The domestic passenger load factor was 64.7 percent (up from 62 percent).

U.S. carriers' international service reached a record high of 47.1 million enplanements, which compares with 45.3 million in 1993. International revenue passenger miles amounted to 140.3 billion (up from 135.5 billion). The international passenger load factor was 70.6 percent, up from 67.7 percent.

The U.S. airlines reported total assets at year-end 1994 of \$83.7 billion, including flight equipment valued at \$51.8 billion.

The world airline fleet of turbine-powered aircraft increased by 1,058 units in 1994, according to the annual survey sponsored by Exxon International. At year-end 1994, the fleet numbered 18,342 aircraft, excluding planes operated by the Russian airline Aeroflot and by air taxi operators. The breakdown includes 12,000 turbojets (up from 11,345), 6,052 turboprops (up from 5,697), and 295 turbine-powered helicopters (up from 242).

The number of U.S.-built turbine aircraft in world service rose from 10,523 in 1993 to 10,913 in 1994. The U.S.-built percentage dropped to 59.5 percent, down from 60.9 percent in 1993.



## OPERATING REVENUES AND EXPENSES OF WORLD SCHEDULED AIRLINES<sup>a</sup>

Calendar Years 1991–1994  
(Millions of U.S. Dollars)

|                                       | 1991              | 1992 <sup>r</sup> | 1993              | 1994 <sup>p</sup> |
|---------------------------------------|-------------------|-------------------|-------------------|-------------------|
| <b>OPERATING REVENUES:</b>            |                   |                   |                   |                   |
| Scheduled Services:                   |                   |                   |                   |                   |
| Passenger .....                       | \$156,760         | \$165,140         | \$171,440         |                   |
| Freight .....                         | 19,400            | 20,110            | 20,270            |                   |
| Mail .....                            | <u>2,310</u>      | <u>2,340</u>      | <u>2,220</u>      |                   |
| Total Scheduled Services .....        | \$178,470         | \$187,590         | \$193,930         | NA                |
| Non-Scheduled Services .....          | 8,260             | 7,870             | 8,230             |                   |
| Incidental .....                      | <u>18,770</u>     | <u>22,340</u>     | <u>23,840</u>     |                   |
| <b>Total Operating Revenues .....</b> | <b>\$205,500</b>  | <b>\$217,800</b>  | <b>\$226,000</b>  | <b>\$247,500</b>  |
| <b>OPERATING EXPENSES:</b>            |                   |                   |                   |                   |
| Flight Operations .....               | \$ 56,420         | \$ 57,360         | \$ 59,270         |                   |
| Maintenance & Overhaul .....          | 23,120            | 23,830            | 22,530            |                   |
| Depreciation & Amortization ....      | 14,310            | 15,380            | 15,580            |                   |
| User Charges & Station Expenses ..... | 34,460            | 37,880            | 38,740            | NA                |
| Passenger Services .....              | 21,380            | 23,630            | 23,580            |                   |
| Ticketing, Sales & Promotion ....     | 34,340            | 36,050            | 36,590            |                   |
| General, Administrative & Other .     | <u>21,970</u>     | <u>25,470</u>     | <u>27,410</u>     |                   |
| <b>Total Operating Expenses .....</b> | <b>\$206,000</b>  | <b>\$219,600</b>  | <b>\$223,700</b>  | <b>\$239,500</b>  |
| <b>OPERATING RESULT .....</b>         | <b>\$ (500)</b>   | <b>\$ (1,800)</b> | <b>\$ 2,300</b>   | <b>\$ 8,000</b>   |
| Percent of Revenue .....              | -0.2%             | -0.8%             | 1.0%              | 3.2%              |
| <b>NET RESULT<sup>b</sup> .....</b>   | <b>\$ (3,500)</b> | <b>\$ (7,900)</b> | <b>\$ (4,400)</b> | <b>\$ (500)</b>   |
| Percent of Revenue .....              | -1.7%             | -3.8%             | -1.9%             | -0.2%             |

Source: International Civil Aviation Organization, "Civil Aviation Statistics of the World" (Annually).

a Excludes domestic operations in the Commonwealth of Independent States.

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

NA Not available.

p Preliminary.

r Revised.

() Denotes loss.

**TRAFFIC STATISTICS**  
**WORLD AIRLINE SCHEDULED SERVICE<sup>a</sup>**  
 Calendar Years 1970-1994

| Year              | Passen-<br>gers<br>Carried | Freight<br>Tons<br>Carried | Passen-<br>ger-<br>Miles<br>Per-<br>formed | Seat-<br>Miles<br>Avail-<br>able | Passen-<br>ger<br>Load<br>Factor | Ton-Miles Performed |            |  |
|-------------------|----------------------------|----------------------------|--|----------------------------------|----------------------------------|---------------------|------------|--|
|                   |                            |                            |  |                                  |                                  | Freight             | Mail       | TOTAL<br>(Passen-<br>gers &<br>Baggage,<br>Freight,<br>Mail) |
|                   |                            |                            |  |                                  |                                  | (Millions)          | (Billions) | (Percent)  |
| 1970              | 383                        | 6.7                        | 286  | 522                              | 55 %                             | 8,180               | 2,150      | 38,810   |
| 1971              | 411                        | 7.4                        | 307  | 568                              | 54                               | 9,060               | 1,990      | 41,420   |
| 1972              | 450                        | 8.0                        | 348  | 609                              | 57                               | 10,290              | 1,900      | 46,690   |
| 1973              | 489                        | 9.0                        | 384  | 667                              | 58                               | 12,010              | 1,970      | 51,910   |
| 1974              | 515                        | 9.5                        | 408  | 688                              | 59                               | 13,030              | 1,980      | 55,270   |
| 1975              | 534                        | 9.6                        | 433  | 733                              | 59                               | 13,270              | 1,990      | 58,080   |
| 1976              | 576                        | 10.3                       | 475  | 789                              | 60                               | 14,750              | 2,080      | 63,880   |
| 1977              | 610                        | 11.1                       | 508  | 837                              | 61                               | 16,190              | 2,180      | 68,790   |
| 1978              | 679                        | 11.7                       | 582  | 902                              | 65                               | 17,770              | 2,240      | 77,770   |
| 1979              | 754                        | 12.1                       | 659  | 999                              | 66                               | 19,190              | 2,350      | 86,900   |
| 1980              | 748                        | 12.2                       | 677  | 1,071                            | 63                               | 20,120              | 2,520      | 89,710   |
| 1981              | 752                        | 12.0                       | 695  | 1,091                            | 64                               | 21,150              | 2,600      | 92,800   |
| 1982              | 766                        | 12.8                       | 710  | 1,115                            | 64                               | 21,600              | 2,650      | 94,830   |
| 1983              | 798                        | 13.5                       | 739  | 1,151                            | 64                               | 24,050              | 2,740      | 100,270  |
| 1984              | 848                        | 14.8                       | 794  | 1,225                            | 65                               | 27,170              | 2,950      | 109,040  |
| 1985              | 899                        | 15.1                       | 849  | 1,293                            | 66                               | 27,290              | 3,010      | 114,860  |
| 1986              | 960                        | 16.2                       | 902  | 1,389                            | 65                               | 29,580              | 3,110      | 122,470  |
| 1987              | 1,028                      | 17.7                       | 987  | 1,471                            | 67                               | 33,100              | 3,220      | 134,570  |
| 1988              | 1,082                      | 19.0                       | 1,059                                      | 1,568                            | 68                               | 36,490              | 3,310      | 145,290  |
| 1989 <sup>r</sup> | 1,109                      | 20.0                       | 1,102                                      | 1,620                            | 68                               | 39,132              | 3,464      | 152,760  |
| 1990 <sup>r</sup> | 1,165                      | 20.2                       | 1,177                                      | 1,740                            | 68                               | 40,290              | 3,650      | 161,130  |
| 1991 <sup>r</sup> | 1,135                      | 19.2                       | 1,146                                      | 1,726                            | 66                               | 40,114              | 3,490      | 157,950  |
| 1992 <sup>r</sup> | 1,148                      | 17.3                       | 1,198                                      | 1,817                            | 66                               | 42,886              | 3,506      | 165,720  |
| 1993              | 1,141                      | 19.3                       | 1,214                                      | 1,875                            | 65                               | 46,220              | 3,580      | 171,290  |
| 1994 <sup>p</sup> | 1,203                      | 22.0                       | 1,296                                      | 1,959                            | 66                               | 52,420              | 3,750      | 185,960  |

Source: International Civil Aviation Organization (ICAO).

a Includes international and domestic traffic on scheduled service performed by the airlines of the 183 states which were members of ICAO in 1994.

p Preliminary.

r Revised.



## OPERATING REVENUES AND EXPENSES OF U.S. AIR CARRIERS<sup>a</sup> DOMESTIC AND INTERNATIONAL OPERATIONS

Calendar Years 1964–1994  
(Millions of Dollars)

| Year              | TOTAL OPERATIONS <sup>b</sup> |                    |                            | Domestic Operations |                    |                            | International Operations |                    |                            |
|-------------------|-------------------------------|--------------------|----------------------------|---------------------|--------------------|----------------------------|--------------------------|--------------------|----------------------------|
|                   | Operating Revenues            | Operating Expenses | Operating Profit (or Loss) | Operating Revenues  | Operating Expenses | Operating Profit (or Loss) | Operating Revenues       | Operating Expenses | Operating Profit (or Loss) |
| 1964              | \$ 4,251                      | \$ 3,781           | \$ 470                     | \$ 3,169            | \$ 2,849           | \$ 320                     | \$ 1,082                 | \$ 932             | \$ 150                     |
| 1965              | 4,958                         | 4,286              | 672                        | 3,691               | 3,239              | 452                        | 1,267                    | 1,047              | 220                        |
| 1966              | 5,745                         | 4,970              | 775                        | 4,171               | 3,670              | 502                        | 1,574                    | 1,300              | 274                        |
| 1967              | 6,865                         | 6,157              | 708                        | 4,981               | 4,560              | 421                        | 1,884                    | 1,597              | 287                        |
| 1968              | 7,753                         | 7,248              | 505                        | 5,691               | 5,397              | 295                        | 2,062                    | 1,852              | 210                        |
| 1969              | 8,791                         | 8,403              | 387                        | 6,936               | 6,613              | 322                        | 1,855                    | 1,790              | 65                         |
| 1970              | 9,290                         | 9,247              | 43                         | 7,180               | 7,181              | (1)                        | 2,109                    | 2,066              | 44                         |
| 1971              | 10,046                        | 9,717              | 328                        | 7,753               | 7,496              | 257                        | 2,292                    | 2,221              | 71                         |
| 1972              | 11,163                        | 10,578             | 584                        | 8,652               | 8,158              | 493                        | 2,512                    | 2,420              | 91                         |
| 1973              | 12,419                        | 11,834             | 585                        | 9,694               | 9,200              | 494                        | 2,725                    | 2,633              | 91                         |
| 1974              | 14,703                        | 13,978             | 725                        | 11,546              | 10,761             | 785                        | 3,157                    | 3,218              | (60)                       |
| 1975              | 15,356                        | 15,229             | 128                        | 12,020              | 11,903             | 117                        | 3,336                    | 3,326              | 11                         |
| 1976              | 17,503                        | 16,781             | 721                        | 13,899              | 13,324             | 575                        | 3,605                    | 3,457              | 147                        |
| 1977              | 19,926                        | 19,018             | 908                        | 15,822              | 15,166             | 657                        | 4,104                    | 3,852              | 252                        |
| 1978              | 22,892                        | 21,527             | 1,366                      | 18,189              | 17,172             | 1,018                      | 4,703                    | 4,355              | 348                        |
| 1979              | 27,227                        | 27,028             | 199                        | 21,652              | 21,523             | 129                        | 5,575                    | 5,505              | 69                         |
| 1980              | 33,728                        | 33,949             | (222)                      | 26,404              | 26,409             | (6)                        | 6,543                    | 6,766              | (223)                      |
| 1981              | 36,211                        | 36,612             | (401)                      | 28,788              | 29,051             | (264)                      | 6,390                    | 6,574              | (184)                      |
| 1982              | 36,066                        | 36,804             | (739)                      | 28,728              | 29,478             | (750)                      | 6,435                    | 6,452              | (17)                       |
| 1983              | 38,593                        | 38,231             | 362                        | 31,014              | 31,186             | (171)                      | 7,163                    | 6,693              | 470                        |
| 1984              | 44,060                        | 41,946             | 2,114                      | 35,394              | 33,812             | 1,582                      | 7,975                    | 7,485              | 490                        |
| 1985              | 48,580                        | 47,207             | 1,372                      | 37,629              | 36,611             | 1,018                      | 8,302                    | 7,984              | 319                        |
| 1986              | 50,086                        | 48,855             | 1,231                      | 41,001              | 39,984             | 1,060                      | 8,621                    | 8,458              | 163                        |
| 1987              | 56,787                        | 54,339             | 2,448                      | 45,658              | 43,925             | 1,733                      | 10,925                   | 10,226             | 698                        |
| 1988              | 63,679                        | 60,236             | 3,443                      | 50,187              | 47,739             | 2,448                      | 11,402                   | 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 <sup>p</sup> | 87,370                        | 84,608             | 2,762                      | 65,260              | 62,974             | 2,286                      | 22,110                   | 21,634             | 476                        |

Source: Department of Transportation, Office of Aviation Statistics, "Air Carrier Financial Statistics Quarterly" (Quarterly).

NOTE: Detail may not add to totals because of rounding.

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

b For 1980 and subsequent years, includes "Other" operations not reported as "Domestic" or "International."

p Preliminary.

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

Calendar Years 1969–1994  
(Millions of Dollars)

| Year              | TOTAL Assets | Value of Flight Equipment | Value of Ground Property & Equipment & Other <sup>a</sup> | Less: Reserves for Depreciation & Overhaul | Equals: Net Value of Owned Operating Property & Equipment | Investment in Operating Property and Equipment as a Percent of Total Assets |
|-------------------|--------------|---------------------------|---|--|---|---|
| 1969              | \$12,069     | \$ 9,943                  | \$ 1,516  | \$ 3,560                                   | \$ 7,899  | 65.4 %  |
| 1970              | 12,913       | 10,950                    | 1,951   | 4,120                                      | 8,782   | 68.0  |
| 1971              | 12,998       | 11,221                    | 2,028   | 4,649                                      | 8,600   | 66.2  |
| 1972              | 13,635       | 11,918                    | 2,225   | 5,115                                      | 9,028   | 66.2  |
| 1973              | 14,464       | 12,908                    | 2,424   | 5,693                                      | 9,639   | 66.6  |
| 1974              | 15,200       | 13,538                    | 2,539   | 6,252                                      | 9,826   | 64.6  |
| 1975              | 15,064       | 14,035                    | 2,635   | 6,823                                      | 9,847   | 65.4  |
| 1976              | 15,454       | 14,399                    | 2,792   | 7,585                                      | 9,605   | 62.2  |
| 1977              | 16,869       | 14,822                    | 2,997   | 8,141                                      | 9,679   | 57.4  |
| 1978              | 20,745       | 16,127                    | 3,367   | 8,799                                      | 10,696  | 51.6  |
| 1979              | 24,907       | 18,561                    | 3,985   | 9,746                                      | 12,800  | 51.4  |
| 1980              | 28,900       | 20,859                    | 4,682   | 10,309                                     | 15,233  | 52.7  |
| 1981              | 30,513       | 22,375                    | 5,175   | 11,028                                     | 16,521  | 54.1  |
| 1982              | 31,525       | 23,786                    | 5,424   | 11,405                                     | 17,804  | 56.5  |
| 1983              | 35,213       | 26,588                    | 6,191   | 12,910                                     | 19,868  | 56.4  |
| 1984              | 36,769       | 28,509                    | 6,061   | 14,043                                     | 20,527  | 55.8  |
| 1985              | 40,978       | 30,402                    | 6,772   | 15,467                                     | 21,707  | 53.0  |
| 1986              | 47,105       | 31,750                    | 8,468   | 14,764                                     | 25,454  | 54.0  |
| 1987              | 51,436       | 33,177                    | 9,223   | 15,580                                     | 26,820  | 52.1  |
| 1988              | 56,047       | 35,781                    | 10,248  | 17,450                                     | 28,579  | 51.0  |
| 1989              | 62,454       | 38,812                    | 11,903  | 19,018                                     | 31,697  | 50.8  |
| 1990              | 67,769       | 40,215                    | 13,523  | 20,593                                     | 33,144  | 48.9  |
| 1991              | 70,332       | 42,897                    | 14,285  | 22,009                                     | 35,173  | 50.0  |
| 1992              | 75,426       | 48,563                    | 15,219  | 24,445                                     | 39,337  | 52.2  |
| 1993              | 82,399       | 51,513                    | 15,438  | 24,949                                     | 42,003  | 51.0  |
| 1994 <sup>p</sup> | 83,692       | 51,828                    | 15,490  | 26,268                                     | 41,049  | 49.0  |

Source: Department of Transportation, Office of Aviation Statistics, "Air Carrier Financial Statistics Quarterly" (Quarterly).

<sup>a</sup> Includes land and construction in progress.

<sup>p</sup> Preliminary.

## SOURCES OF OPERATING REVENUES OF U.S. AIR CARRIERS<sup>a</sup> DOMESTIC AND INTERNATIONAL OPERATIONS

Calendar Years 1980–1994  
(Millions of Dollars)

| Year                            | TOTAL<br>Operating<br>Revenues | Passenger<br>Service <sup>b</sup> | Mail  | Freight <sup>b</sup><br>& Air<br>Express | Excess<br>Baggage | Other <sup>c</sup> |
|---------------------------------|--------------------------------|-----------------------------------|-------|--|-------------------|--------------------|
| <b>DOMESTIC OPERATIONS</b>      |                                |                                   |       |  |                   |                    |
| 1980                            | \$26,404                       | \$23,317                          | \$446 | \$1,582                                  | \$ 32             | \$1,027            |
| 1981                            | 28,788                         | 25,504                            | 497   | 1,659                                    | 36                | 1,091              |
| 1982                            | 28,728                         | 25,440                            | 524   | 1,505                                    | 42                | 1,218              |
| 1983                            | 31,014                         | 27,519                            | 516   | 1,602                                    | 52                | 1,326              |
| 1984                            | 35,393                         | 31,437                            | 552   | 1,716                                    | 70                | 1,618              |
| 1985                            | 37,629                         | 33,343                            | 733   | 1,581                                    | 78                | 1,895              |
| 1986                            | 41,001                         | 33,814                            | 679   | 4,278                                    | 85                | 2,159              |
| 1987                            | 45,658                         | 37,492                            | 704   | 4,952                                    | 67                | 2,443              |
| 1988                            | 50,187                         | 41,002                            | 789   | 5,807                                    | 72                | 2,518              |
| 1989                            | 54,314                         | 43,670                            | 767   | 5,408                                    | 70                | 4,399              |
| 1990                            | 57,994                         | 46,282                            | 747   | 4,276                                    | 76                | 6,613              |
| 1991                            | 56,230                         | 44,594                            | 734   | 4,487                                    | 78                | 6,337              |
| 1992                            | 57,654                         | 45,246                            | 937   | 4,655                                    | 87                | 6,729              |
| 1993                            | 63,233                         | 49,289                            | 974   | 5,266                                    | 91                | 7,612              |
| 1994 <sup>p</sup>               | 65,260                         | 49,940                            | 976   | 5,727                                    | 109               | 8,508              |
| <b>INTERNATIONAL OPERATIONS</b> |                                |                                   |       |  |                   |                    |
| 1980                            | \$ 6,543                       | \$ 4,984                          | \$175 | \$1,011                                  | \$ 25             | \$ 348             |
| 1981                            | 6,390                          | 4,916                             | 165   | 984                                      | 25                | 299                |
| 1982                            | 6,435                          | 4,959                             | 177   | 990                                      | 25                | 283                |
| 1983                            | 7,163                          | 5,605                             | 152   | 999                                      | 23                | 384                |
| 1984                            | 7,975                          | 6,074                             | 158   | 1,169                                    | 27                | 546                |
| 1985                            | 8,302                          | 6,451                             | 161   | 1,130                                    | 28                | 532                |
| 1986                            | 8,621                          | 6,551                             | 154   | 1,451                                    | 28                | 437                |
| 1987                            | 10,925                         | 8,374                             | 180   | 1,783                                    | 33                | 555                |
| 1988                            | 13,402                         | 10,357                            | 183   | 2,150                                    | 39                | 672                |
| 1989                            | 14,911                         | 11,181                            | 188   | 2,417                                    | 47                | 1,078              |
| 1990                            | 17,990                         | 13,468                            | 223   | 2,602                                    | 43                | 1,654              |
| 1991                            | 18,928                         | 14,103                            | 223   | 3,134                                    | 50                | 1,419              |
| 1992                            | 20,486                         | 15,664                            | 247   | 2,980                                    | 47                | 1,547              |
| 1993                            | 21,326                         | 15,915                            | 237   | 3,220                                    | 49                | 1,905              |
| 1994 <sup>p</sup>               | 22,110                         | 16,229                            | 212   | 3,449                                    | 46                | 2,174              |

Source: Department of Transportation, Office of Aviation Statistics, "Air Carrier Financial Statistics Quarterly" (Quarterly).

NOTE: Detail may not add to totals because of rounding.

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

b Scheduled and charter.

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

p Preliminary.

**OPERATING EXPENSES OF U.S. AIR CARRIERS<sup>a</sup>**  
**DOMESTIC AND INTERNATIONAL OPERATIONS**

Calendar Years 1980–1994  
(Millions of Dollars)

| Year                            | TOTAL<br>Operating<br>Expenses | Flying<br>Opera-<br>tions | Mainte-<br>nance | Passen-<br>ger<br>Service | Aircraft<br>& Traffic<br>& Servicing | Promo-<br>tion<br>and<br>Sales | Depreci-<br>ation &<br>Amorti-<br>zation | Other <sup>b</sup> |
|---------------------------------|--------------------------------|---------------------------|------------------|---------------------------|--------------------------------------|--------------------------------|--|--------------------|
| <b>DOMESTIC OPERATIONS</b>      |                                |                           |                  |                           |                                      |                                |  |                    |
| 1980                            | \$26,409                       | \$11,029                  | \$2,758          | \$2,329                   | \$ 4,051                             | \$3,096                        | \$1,560                                  | \$1,586            |
| 1981                            | 29,051                         | 12,037                    | 2,822            | 2,522                     | 4,497                                | 3,708                          | 1,723                                    | 1,742              |
| 1982                            | 29,478                         | 11,529                    | 2,709            | 2,668                     | 4,665                                | 4,160                          | 1,876                                    | 1,869              |
| 1983                            | 31,186                         | 11,370                    | 2,878            | 2,983                     | 5,104                                | 4,764                          | 2,107                                    | 1,980              |
| 1984                            | 33,812                         | 12,161                    | 3,176            | 3,192                     | 5,369                                | 5,310                          | 2,223                                    | 2,380              |
| 1985                            | 36,611                         | 12,684                    | 3,604            | 3,464                     | 5,781                                | 6,089                          | 2,318                                    | 2,670              |
| 1986                            | 39,934                         | 11,368                    | 4,475            | 3,793                     | 7,680                                | 6,820                          | 2,652                                    | 3,171              |
| 1987                            | 43,925                         | 12,509                    | 4,951            | 4,169                     | 8,575                                | 7,399                          | 2,855                                    | 3,468              |
| 1988                            | 47,739                         | 13,176                    | 5,643            | 4,444                     | 9,527                                | 8,235                          | 2,977                                    | 3,737              |
| 1989                            | 52,460                         | 14,749                    | 6,184            | 4,775                     | 9,449                                | 8,718                          | 3,078                                    | 5,507              |
| 1990                            | 58,983                         | 18,166                    | 6,921            | 5,220                     | 9,094                                | 9,102                          | 3,273                                    | 7,207              |
| 1991                            | 56,758                         | 16,831                    | 6,682            | 5,068                     | 9,140                                | 8,856                          | 3,217                                    | 6,964              |
| 1992                            | 58,801                         | 17,203                    | 6,884            | 5,327                     | 9,783                                | 8,936                          | 3,340                                    | 7,328              |
| 1993                            | 61,157                         | 17,622                    | 7,025            | 5,241                     | 10,172                               | 9,387                          | 3,621                                    | 8,089              |
| 1994 <sup>p</sup>               | 62,974                         | 17,701                    | 7,169            | 5,307                     | 10,362                               | 9,782                          | 3,750                                    | 8,902              |
| <b>INTERNATIONAL OPERATIONS</b> |                                |                           |                  |                           |                                      |                                |  |                    |
| 1980                            | \$ 6,766                       | \$ 2,775                  | \$ 616           | \$ 600                    | \$1,049                              | \$ 917                         | \$ 385                                   | \$ 423             |
| 1981                            | 6,574                          | 2,757                     | 540              | 583                       | 932                                  | 945                            | 382                                      | 435                |
| 1982                            | 6,452                          | 2,596                     | 512              | 577                       | 893                                  | 954                            | 396                                      | 525                |
| 1983                            | 6,693                          | 2,490                     | 548              | 664                       | 936                                  | 1,162                          | 389                                      | 505                |
| 1984                            | 7,485                          | 2,629                     | 677              | 749                       | 975                                  | 1,308                          | 446                                      | 701                |
| 1985                            | 7,984                          | 2,738                     | 768              | 852                       | 1,069                                | 1,414                          | 482                                      | 662                |
| 1986                            | 8,458                          | 2,402                     | 901              | 877                       | 1,386                                | 1,665                          | 518                                      | 711                |
| 1987                            | 10,226                         | 2,836                     | 1,096            | 1,059                     | 1,749                                | 2,094                          | 533                                      | 860                |
| 1988                            | 12,403                         | 3,230                     | 1,332            | 1,280                     | 2,193                                | 2,742                          | 618                                      | 1,009              |
| 1989                            | 14,954                         | 3,919                     | 1,724            | 1,454                     | 2,483                                | 3,108                          | 746                                      | 1,520              |
| 1990                            | 18,878                         | 5,454                     | 2,051            | 1,738                     | 2,657                                | 3,833                          | 887                                      | 2,295              |
| 1991                            | 20,185                         | 5,636                     | 2,152            | 1,861                     | 2,831                                | 4,602                          | 892                                      | 2,210              |
| 1992                            | 21,784                         | 5,843                     | 2,148            | 2,204                     | 3,255                                | 5,229                          | 1,033                                    | 2,073              |
| 1993                            | 21,964                         | 5,928                     | 1,967            | 2,175                     | 3,072                                | 5,339                          | 1,077                                    | 2,406              |
| 1994 <sup>p</sup>               | 21,634                         | 5,787                     | 2,024            | 2,311                     | 3,310                                | 4,328                          | 1,230                                    | 2,645              |

Source: Department of Transportation, Office of Aviation Statistics, "Air Carrier Financial Statistics Quarterly" (Quarterly).

NOTE: Detail may not add to totals because of rounding.

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

b General and administrative and other transport-related expenses.

p Preliminary.

**TRAFFIC STATISTICS**  
**U.S. AIR CARRIER SCHEDULED SERVICE<sup>a</sup>**  
 Calendar Years 1964–1994

| Year              | Revenue Ton-Miles<br>(Millions) |                    |        | Total<br>Available<br>Ton-Miles<br>(Millions) | Total<br>Revenue<br>Load<br>Factor | Aircraft<br>Revenue<br>Miles<br>(Millions) | Average<br>Overall<br>Flight<br>Stage<br>Length<br>(Miles) | Average<br>Available<br>Seats<br>per<br>Aircraft<br>Mile |
|-------------------|---------------------------------|--------------------|--------|---|------------------------------------|--|--|--|
|                   | Passen-<br>ger                  | Cargo <sup>b</sup> | Total  |   |                                    |  |  |  |
| 1964              | 5,630                           | 1,803              | 7,434  | 15,514  | 47.9%                              | 1,189                                      | 301  | 93   |
| 1965              | 6,629                           | 2,356              | 8,986  | 18,408  | 48.8                               | 1,354                                      | 322  | 96   |
| 1966              | 7,736                           | 2,949              | 10,686 | 20,939  | 51.0                               | 1,482                                      | 339  | 98   |
| 1967              | 9,561                           | 3,475              | 13,036 | 26,968  | 48.3                               | 1,834                                      | 371  | 101  |
| 1968              | 11,023                          | 4,226              | 15,249 | 33,221  | 45.9                               | 2,146                                      | 401  | 107  |
| 1969              | 12,197                          | 4,701              | 16,898 | 38,664  | 43.7                               | 2,385                                      | 443  | 112  |
| 1970              | 13,171                          | 4,994              | 18,166 | 41,693  | 43.6                               | 2,426                                      | 473  | 117  |
| 1971              | 13,565                          | 5,120              | 18,685 | 44,139  | 42.3                               | 2,378                                      | 476  | 125  |
| 1972              | 15,241                          | 5,506              | 20,746 | 45,583  | 45.5                               | 2,376                                      | 471  | 129  |
| 1973              | 16,196                          | 6,046              | 22,242 | 49,019  | 45.4                               | 2,448                                      | 477  | 135  |
| 1974              | 16,292                          | 6,133              | 22,425 | 46,848  | 47.9                               | 2,258                                      | 478  | 140  |
| 1975              | 16,281                          | 5,905              | 22,186 | 47,254  | 46.9                               | 2,241                                      | 476  | 143  |
| 1976              | 17,899                          | 6,222              | 24,121 | 49,325  | 48.9                               | 2,320                                      | 480  | 146  |
| 1977              | 19,322                          | 6,587              | 25,909 | 52,284  | 49.6                               | 2,419                                      | 490  | 149  |
| 1978              | 22,678                          | 7,001              | 29,679 | 54,765  | 54.2                               | 2,520                                      | 502  | 152  |
| 1979              | 26,202                          | 7,189              | 33,390 | 60,844  | 54.9                               | 2,791                                      | 517  | 154  |
| 1980              | 25,519                          | 7,084              | 32,603 | 62,983  | 51.8                               | 2,816                                      | 526  | 158  |
| 1981              | 24,889                          | 7,060              | 31,949 | 61,186  | 52.2                               | 2,703                                      | 519  | 161  |
| 1982              | 25,964                          | 6,886              | 32,850 | 62,401  | 52.6                               | 2,699                                      | 544  | 167  |
| 1983              | 28,183                          | 7,573              | 35,756 | 65,385  | 54.7                               | 2,809                                      | 558  | 169  |
| 1984              | 30,512                          | 8,185              | 38,697 | 72,223  | 53.6                               | 3,134                                      | 575  | 168  |
| 1985              | 33,640                          | 7,689              | 41,329 | 76,059  | 54.3                               | 3,320                                      | 569  | 168  |
| 1986              | 36,655                          | 9,026              | 45,681 | 85,140  | 53.7                               | 3,725                                      | 580  | 168  |
| 1987              | 40,453                          | 10,016             | 50,469 | 92,209  | 54.7                               | 3,988                                      | 606  | 167  |
| 1988              | 42,330                          | 11,469             | 53,800 | 97,899  | 55.0                               | 4,141                                      | 618  | 169  |
| 1989              | 43,271                          | 12,187             | 55,458 | 100,082                                       | 55.4                               | 4,193                                      | 633  | 169  |
| 1990              | 45,793                          | 12,549             | 58,342 | 107,559                                       | 54.2                               | 4,491                                      | 649  | 170  |
| 1991              | 44,795                          | 12,130             | 56,925 | 105,599                                       | 53.9                               | 4,416                                      | 651  | 169  |
| 1992              | 47,855                          | 13,199             | 61,054 | 112,749                                       | 54.2                               | 4,661                                      | 661  | 169  |
| 1993 <sup>r</sup> | 48,968                          | 14,120             | 63,088 | 115,473                                       | 54.6                               | 4,846                                      | 669  | 166  |
| 1994              | 51,916                          | 15,990             | 67,895 | 120,550                                       | 56.3                               | 5,027                                      | 669  | 163  |

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

NOTE: Detail may not add to totals because of rounding.

a Includes international and domestic operations.

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

r Revised.

**PASSENGER STATISTICS**  
**U.S. AIR CARRIER SCHEDULED SERVICE**  
**DOMESTIC AND INTERNATIONAL OPERATIONS**  
 Calendar Years 1980–1994

| Year                            | Revenue Passenger Enplanements (Thousands) | Average Passenger Trip-Length (Miles) | Revenue Passenger Miles (Millions) | Available Seat Miles (Millions) | Revenue Passenger Load Factor <sup>a</sup> |
|---------------------------------|--|---------------------------------------|------------------------------------|---------------------------------|--|
| <b>DOMESTIC OPERATIONS</b>      |  |                                       |                                    |                                 |  |
| 1980                            | 272,829                                    | 736                                   | 200,829                            | 346,028                         | 58.0                                       |
| 1981                            | 265,304                                    | 749                                   | 198,715                            | 346,172                         | 57.4                                       |
| 1982                            | 274,342                                    | 766                                   | 210,149                            | 359,528                         | 58.5                                       |
| 1983                            | 296,721                                    | 765                                   | 226,909                            | 379,150                         | 59.8                                       |
| 1984                            | 321,047                                    | 759                                   | 243,692                            | 422,507                         | 57.7                                       |
| 1985                            | 357,109                                    | 758                                   | 270,584                            | 445,826                         | 60.7                                       |
| 1986                            | 393,864                                    | 767                                   | 302,090                            | 497,991                         | 60.7                                       |
| 1987                            | 416,831                                    | 779                                   | 324,637                            | 526,958                         | 61.6                                       |
| 1988                            | 419,210                                    | 786                                   | 329,309                            | 536,663                         | 61.4                                       |
| 1989                            | 416,331                                    | 793                                   | 329,975                            | 530,079                         | 62.3                                       |
| 1990                            | 423,565                                    | 803                                   | 340,231                            | 563,065                         | 60.4                                       |
| 1991                            | 412,360                                    | 806                                   | 332,566                            | 543,638                         | 61.2                                       |
| 1992                            | 431,693                                    | 806                                   | 347,931                            | 557,989                         | 62.4                                       |
| 1993 <sup>r</sup>               | 443,172                                    | 799                                   | 354,177                            | 571,489                         | 62.0                                       |
| 1994                            | 481,302                                    | 787                                   | 378,846                            | 585,102                         | 64.7                                       |
| <b>INTERNATIONAL OPERATIONS</b> |  |                                       |                                    |                                 |  |
| 1980                            | 24,074                                     | 2,258                                 | 54,363                             | 86,507                          | 62.8                                       |
| 1981                            | 20,672                                     | 2,427                                 | 50,173                             | 78,725                          | 63.7                                       |
| 1982                            | 19,760                                     | 2,505                                 | 49,495                             | 80,591                          | 61.4                                       |
| 1983                            | 21,917                                     | 2,506                                 | 54,920                             | 85,388                          | 64.3                                       |
| 1984                            | 23,636                                     | 2,599                                 | 61,424                             | 92,817                          | 66.2                                       |
| 1985                            | 24,913                                     | 2,642                                 | 65,819                             | 101,963                         | 64.6                                       |
| 1986                            | 25,082                                     | 2,570                                 | 64,456                             | 109,445                         | 58.9                                       |
| 1987                            | 30,847                                     | 2,588                                 | 79,834                             | 121,763                         | 65.6                                       |
| 1988                            | 35,404                                     | 2,655                                 | 93,992                             | 140,140                         | 67.1                                       |
| 1989                            | 37,361                                     | 2,750                                 | 102,739                            | 154,297                         | 66.6                                       |
| 1990                            | 41,995                                     | 2,803                                 | 117,695                            | 170,310                         | 69.1                                       |
| 1991                            | 39,941                                     | 2,889                                 | 115,389                            | 171,561                         | 67.3                                       |
| 1992                            | 43,415                                     | 3,009                                 | 130,622                            | 194,784                         | 67.1                                       |
| 1993                            | 45,348 <sup>r</sup>                        | 2,988                                 | 135,508 <sup>r</sup>               | 200,151                         | 67.7                                       |
| 1994                            | 47,074                                     | 2,981                                 | 140,315                            | 198,738                         | 70.6                                       |

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

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

r Revised.

**TURBINE-ENGINED AIRCRAFT IN THE WORLD AIRLINE FLEET**

(By Model, 1990–1994)

|                                    | 1990             | 1991             | 1992             | 1993          | 1994          |
|------------------------------------|------------------|------------------|------------------|---------------|---------------|
| <b>TOTAL AIRCRAFT IN SERVICE .</b> | 14,651           | 15,181           | 16,100           | 17,284        | 18,342        |
| <b>Turbojets—TOTAL</b> .....       | <u>9,426</u>     | <u>9,819</u>     | <u>10,504</u>    | <u>11,345</u> | <u>12,000</u> |
| Aerospatiale SE-210 Caravelle .    | 49               | 38               | 34               | 29            | 28            |
| Aerospatiale SN-601 Corvette .     | 7                | 2                | —                | —             | —             |
| Airbus A300 .....                  | 327              | 331              | 346              | 374           | 391           |
| Airbus A310 .....                  | 180              | 193              | 207              | 222           | 217           |
| Airbus A320 .....                  | 130              | 247              | 354              | 413           | 463           |
| Airbus A321 .....                  | —                | —                | —                | —             | 17            |
| Airbus A330 .....                  | —                | —                | —                | 1             | 10            |
| Airbus A340 .....                  | —                | —                | —                | 20            | 44            |
| Antonov 124 .....                  | —                | 7                | 7                | 13            | 13            |
| Avro RJ-70/85/100 .....            | (a)              | (a)              | (a)              | 12            | 30            |
| B.Ae./Aerospatiale Concorde .      | 14               | 14               | 14               | 14            | 13            |
| B.Ae. 146 .....                    | 144 <sup>a</sup> | 166 <sup>a</sup> | 173 <sup>a</sup> | 185           | 196           |
| B.Ae. One-Eleven .....             | 132              | 146              | 143              | 121           | 120           |
| B.Ae. Trident .....                | 25               | 32               | 9                | 9             | 9             |
| B.Ae. (HS) 125 .....               | 16               | 17               | 19               | 23            | 22            |
| Beech 400 Beechjet .....           | —                | 1                | 3                | 2             | 2             |
| Boeing 707/720 .....               | 210              | 198              | 176              | 151           | 151           |
| Boeing 727 .....                   | 1,648            | 1,515            | 1,457            | 1,390         | 1,373         |
| Boeing 737 .....                   | 1,836            | 2,019            | 2,189            | 2,363         | 2,476         |
| Boeing 747 .....                   | 775              | 806              | 865              | 918           | 957           |
| Boeing 757 .....                   | 324              | 380              | 497              | 566           | 629           |
| Boeing 767 .....                   | 345              | 399              | 462              | 515           | 550           |
| Canadair CL-601 Challenger ..      | —                | 2                | 2                | 4             | 2             |
| Canadair Regional Jet .....        | —                | —                | 2                | 23            | 49            |
| Cessna Citation I/II/III .....     | 43               | 44               | 35               | 31            | 36            |
| Convair 880/990 .....              | 2                | —                | 1                | 1             | 1             |
| Dassault Falcon 10/20/50 ....      | 39               | 43               | 41               | 46            | 60            |
| Dassault Mercure .....             | 11               | 11               | 8                | 8             | 5             |
| Fokker F-28 Fellowship .....       | 199              | 197              | 191              | 190           | 185           |
| Fokker 100 .....                   | 58               | 93               | 150              | 220           | 253           |
| Gulfstream II/III G-1159 .....     | 15               | 16               | 17               | 17            | 16            |
| Ilyushin IL-62 .....               | 56               | 39               | 33               | 49            | 84            |
| Ilyushin IL-76 .....               | 60               | 61               | 64               | 83            | 154           |
| Ilyushin IL-86 .....               | —                | —                | —                | 12            | 37            |
| Ilyushin IL-96 .....               | —                | —                | —                | —             | 5             |
| Israel Aircraft 1121/1124 .....    | 2                | 2                | 3                | 12            | 13            |
| Learjet .....                      | 37               | 34               | 37               | 28            | 39            |
| Lockheed L-1011 Tristar .....      | 228              | 227              | 214              | 213           | 208           |
| Lockheed L-1329 Jetstar .....      | 6                | 5                | 4                | 4             | 4             |
| MBB Hansa HFB-320 .....            | —                | —                | —                | —             | 3             |
| McDonnell Douglas DC-8 ....        | 253              | 257              | 261              | 264           | 270           |
| McDonnell Douglas DC-9 ....        | 847              | 741              | 741              | 767           | 791           |
| McDonnell Douglas DC-10 ...        | 365              | 361              | 361              | 354           | 347           |
| McDonnell Douglas MD-11 ...        | 3                | 36               | 73               | 107           | 127           |
| McDonnell Douglas MD-80 ...        | 799              | 908              | 1,032            | 1,067         | 989           |
| Rockwell Sabreliner 60 .....       | 3                | 3                | 2                | 1             | —             |
| Tupolev Tu-134 .....               | 74               | 54               | 82               | 138           | 155           |
| Tupolev Tu-154 .....               | 111              | 156              | 131              | 225           | 283           |
| Tupolev Tu-204 .....               | —                | —                | —                | —             | 5             |
| Yakovlev Yak-40/42 .....           | 55               | 48               | 64               | 140           | 168           |

(Continued on next page)

## TURBINE-ENGINEED AIRCRAFT IN THE WORLD AIRLINE FLEET

(By Model, 1990–1994, continued)

|                                  | 1990       | 1991       | 1992       | 1993       | 1994       |
|----------------------------------|------------|------------|------------|------------|------------|
| <b>Turbine-Powered</b>           |            |            |            |            |            |
| <b>Helicopters—Total</b> .....   | <u>176</u> | <u>188</u> | <u>176</u> | <u>242</u> | <u>295</u> |
| Aerospatiale SA-316 Alouette III | 4          | 4          | —          | —          | —          |
| Aerospatiale SA-318 Alouette II  | 3          | 3          | 2          | 1          | 1          |
| Aerospatiale SA-319 Alouette III |            |            |            |            |            |
| Astazou .....                    | 4          | 4          | 2          | —          | —          |
| Aerospatiale SA-341 Gazelle ..   | —          | 1          | 1          | —          | —          |
| Aerospatiale (Nurtanio)          |            |            |            |            |            |
| SA-330 Puma .....                | 16         | 18         | 18         | 28         | 17         |
| Aerospatiale AS-332 Super Puma   | 5          | 5          | 5          | 5          | 16         |
| Aerospatiale AS-350 Ecureuil/    |            |            |            |            |            |
| Astar .....                      | 10         | 10         | 7          | 3          | 4          |
| Aerospatiale AS-355 Ecureuil 2/  |            |            |            |            |            |
| Twinstar .....                   | 4          | 4          | 4          | 8          | 8          |
| Aerospatiale SA-365 Dauphin II   | 10         | 10         | 10         | 13         | 17         |
| Agusta A109 .....                | —          | 3          | 3          | —          | 1          |
| Bell (Agusta/Fuji) 204 .....     | 6          | 5          | 3          | 3          | 2          |
| Bell 205 .....                   | 2          | 2          | 2          | 2          | 1          |
| Bell 206 Jetranger/Longranger .. | 26         | 33         | 33         | 36         | 54         |
| Bell 212 .....                   | 15         | 15         | 16         | 20         | 21         |
| Bell 214 .....                   | —          | —          | —          | —          | 4          |
| Bell 222 UT .....                | —          | —          | —          | —          | 1          |
| Bell 412 .....                   | 3          | 4          | 6          | 17         | 16         |
| Hughes (Kawasaki) 500/369D ..    | 1          | 1          | —          | —          | —          |
| MBB/Nurtanio Bo.105 .....        | 33         | 33         | 33         | 41         | 41         |
| Mil Mi-8 .....                   | —          | —          | —          | —          | 17         |
| Sikorsky S-55T .....             | 5          | 5          | 5          | 5          | 5          |
| Sikorsky S-58T .....             | 5          | 4          | 4          | 4          | 1          |
| Sikorsky S-61 .....              | 10         | 10         | 10         | 33         | 42         |
| Sikorsky S-62 .....              | —          | —          | —          | —          | 1          |
| Sikorsky S-76 .....              | 11         | 11         | 12         | 23         | 25         |
| Westland 30 .....                | 3          | 3          | —          | —          | —          |

(Continued on next page)



**TURBINE-ENGINEED AIRCRAFT IN THE WORLD AIRLINE FLEET**

(By Model, 1990–1994, continued)

|                                  | 1990         | 1991         | 1992         | 1993         | 1994         |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|
| <b>Turboprops—TOTAL</b> .....    | <u>5,049</u> | <u>5,174</u> | <u>5,420</u> | <u>5,697</u> | <u>6,052</u> |
| Aerospatiale N.262/Mohawk 298    | 16           | 14           | 15           | 10           | 12           |
| Aerospatiale/Aeritalia ATR 42 .. | 178          | 210          | 227          | 242          | 245          |
| Aerospatiale/Aeritalia ATR 72 .. | 17           | 48           | 76           | 103          | 138          |
| Airtech CN-235 .....             | 18           | 24           | 23           | 24           | 24           |
| Antonov An-12 .....              | 19           | 20           | 19           | 25           | 23           |
| Antonov An-22 .....              | —            | —            | 2            | 2            | 2            |
| Antonov An-24/26/28/30/32 ....   | 246          | 216          | 171          | 258          | 307          |
| B.Ae. ATP .....                  | 31           | 41           | 46           | 50           | 53           |
| B.Ae. Vanguard .....             | 5            | 4            | 4            | 3            | 2            |
| B.Ae. Viscount .....             | 33           | 27           | 25           | 23           | 25           |
| B.Ae. (HP-137) Jetstream 31 ...  | 277          | 205          | 309          | 296          | 306          |
| B.Ae. Jetstream 41 .....         | —            | —            | 2            | 18           | 30           |
| B.Ae. HS-748 .....               | 139          | 130          | 123          | 115          | 122          |
| Beech 18 Turbo .....             | 24           | 20           | 17           | 1            | 21           |
| Beech 90 King Air .....          | 26           | 28           | 30           | 38           | 30           |
| Beech 99 .....                   | 140          | 122          | 130          | 139          | 140          |
| Beech 100 King Air .....         | 23           | 24           | 31           | 38           | 44           |
| Beech 200/300 Super King Air ..  | 78           | 76           | 87           | 94           | 101          |
| Beech 1300 .....                 | 14           | 7            | 2            | 4            | 5            |
| Beech 1900C/D .....              | 171          | 191          | 224          | 251          | 291          |
| Bristol 175 Britannia .....      | 6            | 6            | 5            | 5            | 3            |
| Canadair CL-44 .....             | 13           | 11           | 8            | 8            | 4            |
| CASA/Nurtanio C-212 Aviocar ..   | 104          | 109          | 104          | 102          | 107          |
| Cessna 208 Caravan I .....       | 287          | 312          | 307          | 312          | 380          |
| Cessna F406 Caravan II .....     | 19           | 21           | 23           | 19           | 21           |
| Cessna 425/441 Conquest I/II ... | 8            | 4            | 4            | 5            | 7            |
| Convair 580/600/640 .....        | 108          | 92           | 99           | 98           | 110          |
| DHC-2/3 Turbo Beaver/Otter ...   | 4            | 4            | 4            | 6            | 9            |
| DHC-5 Buffalo .....              | 1            | 1            | 1            | 1            | 1            |
| DHC-6 Twin Otter .....           | 432          | 428          | 437          | 419          | 405          |
| DHC-7 Dash 7 .....               | 94           | 79           | 80           | 84           | 73           |
| DHC-8 Dash 8 .....               | 214          | 254          | 307          | 341          | 358          |
| Dornier DO-228 .....             | 113          | 96           | 112          | 116          | 126          |
| Dornier DO-328 .....             | —            | —            | —            | 3            | 15           |
| Douglas DC-3T Turbo Express ..   | —            | 1            | —            | —            | 2            |
| Embraer EMB-110 Bandeirante ..   | 200          | 174          | 181          | 189          | 188          |
| Embraer EMB-120 Brasilia .....   | 201          | 225          | 255          | 267          | 276          |
| Fokker/Fairchild                 |              |              |              |              |              |
| F-27/FH-227 Friendship .....     | 401          | 389          | 378          | 354          | 348          |
| Fokker 50 .....                  | 101          | 121          | 134          | 152          | 164          |

(Continued on next page)

## TURBINE-ENGINEED AIRCRAFT IN THE WORLD AIRLINE FLEET

(By Model, 1990–1994, continued)

|   | 1990          | 1991          | 1992          | 1993          | 1994          |
|---|---------------|---------------|---------------|---------------|---------------|
| <b>Turboprops (continued)</b>             |               |               |               |               |               |
| GAF Nomad .....                           | 9             | 8             | 12            | 11            | 22            |
| Grumman G-21 Turbo Goose .....            | —             | 1             | 1             | 1             | 1             |
| Grumman G-73 Turbo Mallard ..             | 9             | 4             | 5             | 6             | 5             |
| Grumman G-159 Gulfstream I ..             | 34            | 33            | 31            | 33            | 41            |
| Handley Page Herald .....                 | 17            | 17            | 16            | 15            | 16            |
| Harbin Y-12 II .....                      | 2             | 5             | 26            | 33            | 40            |
| IAI Arava .....                           | 3             | 1             | 1             | 1             | 2             |
| Ilyushin IL-18 .....                      | 48            | 42            | 31            | 29            | 33            |
| LET L-410 .....                           | —             | 17            | 19            | 25            | 59            |
| Lockheed L-188 Electra .....              | 74            | 67            | 65            | 65            | 59            |
| Lockheed L-100/L-382 Hercules             | 56            | 54            | 56            | 53            | 54            |
| Mitsubishi MU-2B .....                    | 5             | 8             | 5             | 6             | 7             |
| Nihon AMC YS-11 .....                     | 97            | 94            | 92            | 85            | 85            |
| Pilatus Britten-Norman BN-2T              |               |               |               |               |               |
| Turbo Islander .....                      | 2             | 3             | 2             | 2             | 2             |
| Piper PA-31T/42 Cheyenne ....             | 29            | 25            | 19            | 19            | 17            |
| Piper T-1040 .....                        | 15            | 12            | 13            | 11            | 10            |
| PZL (Antonov) An-28 .....                 | —             | —             | 3             | 3             | 1             |
| Rockwell Turbo Commander ...              | 14            | 15            | 12            | 11            | 9             |
| Saab SF-340A/B .....                      | 206           | 265           | 312           | 347           | 347           |
| Saab 2000 .....                           | —             | —             | —             | —             | 5             |
| Shorts SC-5 Belfast .....                 | 5             | 5             | 5             | 4             | 2             |
| Shorts SC-7 Skyliner/Skyvan ...           | 16            | 25            | 24            | 25            | 31            |
| Shorts 330 .....                          | 64            | 51            | 55            | 56            | 62            |
| Shorts 360 .....                          | 150           | 139           | 147           | 148           | 108           |
| Swearingen Merlin .....                   | 41            | 36            | 36            | 49            | 49            |
| Swearingen Metro .....                    | 249           | 338           | 357           | 377           | 396           |
| Transall C-160 .....                      | 8             | 8             | 8             | 6             | 6             |
| Xian (Antonov) Y-7 .....                  | 31            | 67            | 65            | 61            | 65            |
| <b>TOTAL AIRCRAFT IN SERVICE ..</b>       | <b>14,651</b> | <b>15,181</b> | <b>16,100</b> | <b>17,284</b> | <b>18,347</b> |
| Number Manufactured in U.S. ..            | 9,333         | 9,517         | 10,064        | 10,523        | 10,913        |
| Percent Manufactured in U.S. ..           | 63.7%         | 62.7%         | 62.5%         | 60.9%         | 59.5%         |
| <b>Turbojet Aircraft in Service .....</b> | <b>9,426</b>  | <b>9,819</b>  | <b>10,504</b> | <b>11,345</b> | <b>12,000</b> |
| Number Manufactured in U.S. ..            | 7,737         | 7,950         | 8,427         | 8,759         | 8,949         |
| Percent Manufactured in U.S. ..           | 82.1%         | 81.0%         | 80.2%         | 77.2%         | 74.6%         |
| <b>Turboprop Aircraft in Service ...</b>  | <b>5,049</b>  | <b>5,174</b>  | <b>5,420</b>  | <b>5,697</b>  | <b>6,052</b>  |
| Number Manufactured in U.S. ..            | 1,519         | 1,483         | 1,549         | 1,624         | 1,793         |
| Percent Manufactured in U.S. ..           | 30.1%         | 28.7%         | 28.6%         | 28.5%         | 29.6%         |
| <b>Turbine-Powered Helicopters</b>        |               |               |               |               |               |
| <b>In Service .....</b>                   | <b>176</b>    | <b>188</b>    | <b>176</b>    | <b>242</b>    | <b>295</b>    |
| Number Manufactured in U.S. ..            | 77            | 84            | 88            | 140           | 171           |
| Percent Manufactured in U.S. ..           | 43.8%         | 44.7%         | 50.0%         | 57.9%         | 58.0%         |

Source: Exxon International Company, "Air World Survey," compiled by Aviation Data Service, Inc. (Annually).

NOTE: The "Air World Survey" covers the world's airlines with the exception of Aeroflot and covers aircraft in service as of December 31 and as of March 31 prior to 1991. Excludes air taxi operators.

a RJ-70 combined with B.Ae. 146.

**PERCENT OF CIVIL TURBOJET ENGINE MARKET  
BY MANUFACTURER AND AIRCRAFT MODEL**  
as of December 1994

| Aircraft<br>Manufacturer<br>and Model  | Total<br>Installed<br>Engines | Engine Manufacturers |       |       |       |      |       |
|--|-------------------------------|----------------------|-------|-------|-------|------|-------|
|  |                               | P&W                  | GE    | RR    | CFM   | IAE  | Other |
| <b>TOTAL ENGINES</b> .....             | 36,196                        | 15,704               | 4,070 | 3,404 | 4,202 | 354  | 8,462 |
| <b>PERCENT SHARE</b> .....             | 100.0%                        | 43.4%                | 11.2% | 9.4%  | 11.6% | 1.0% | 23.4% |
| Airbus A300 <sup>a</sup> .....         | 276                           | 19%                  | 81%   | —%    | —%    | —%   | —%    |
| Airbus A300B4-200 .....                | 274                           | 11                   | 89    | —     | —     | —    | —     |
| Airbus A300B4-600R .....               | 266                           | 51                   | 49    | —     | —     | —    | —     |
| Airbus A310 <sup>a</sup> .....         | 160                           | 35                   | 65    | —     | —     | —    | —     |
| Airbus A310-300 .....                  | 292                           | 40                   | 60    | —     | —     | —    | —     |
| Airbus A320 <sup>a</sup> .....         | 36                            | —                    | —     | —     | 100   | —    | —     |
| Airbus A320-200 .....                  | 916                           | —                    | —     | —     | 63    | 37   | —     |
| Airbus A321 .....                      | 32                            | —                    | —     | —     | 44    | 56   | —     |
| Airbus A330 .....                      | 14                            | —                    | 100   | —     | —     | —    | —     |
| Airbus A340 .....                      | 164                           | —                    | —     | —     | 100   | —    | —     |
| Antonov AN-72 .....                    | 12                            | —                    | —     | —     | —     | —    | 100   |
| Antonov AN-74 .....                    | 6                             | —                    | —     | —     | —     | —    | 100   |
| Antonov AN-124 .....                   | 144                           | —                    | —     | —     | —     | —    | 100   |
| AS Corvette .....                      | 8                             | 100                  | —     | —     | —     | —    | —     |
| AS Caravelle .....                     | 58                            | 69                   | —     | 31    | —     | —    | —     |
| AS/BAe Concorde .....                  | 52                            | —                    | —     | 100   | —     | —    | —     |
| Avro Int'l RJ .....                    | 120                           | —                    | —     | —     | —     | —    | 100   |
| BAe 1-11 .....                         | 288                           | —                    | —     | 100   | —     | —    | —     |
| BAe 146 .....                          | 784                           | —                    | —     | —     | —     | —    | 100   |
| BAe HS Trident .....                   | 27                            | —                    | —     | 100   | —     | —    | —     |
| BAe HS 125 .....                       | 48                            | 4                    | —     | 33    | —     | —    | 63    |
| Beech 400 Beechjet .....               | 4                             | 100                  | —     | —     | —     | —    | —     |
| Boeing B-707 <sup>a</sup> .....        | 156                           | 95                   | —     | 5     | —     | —    | —     |
| Boeing B-707-320C .....                | 544                           | 100                  | —     | —     | —     | —    | —     |
| Boeing B-720 .....                     | 36                            | 100                  | —     | —     | —     | —    | —     |
| Boeing B-727 series <sup>a</sup> ..... | 1,179                         | 94                   | —     | 6     | —     | —    | —     |
| Boeing B-727 <sup>b</sup> .....        | 393                           | 100                  | —     | —     | —     | —    | —     |
| Boeing B-727-200 <sup>b</sup> .....    | 561                           | 100                  | —     | —     | —     | —    | —     |
| Boeing B-727-200 ADV .....             | 2,370                         | 100                  | —     | —     | —     | —    | —     |
| Boeing B-737 <sup>a</sup> .....        | 286                           | 80                   | —     | —     | 20    | —    | —     |
| Boeing B-737-200 .....                 | 336                           | 100                  | —     | —     | —     | —    | —     |
| Boeing B-737-200 ADV .....             | 1,424                         | 100                  | —     | —     | —     | —    | —     |
| Boeing B-737-300 .....                 | 1,684                         | —                    | —     | —     | 100   | —    | —     |
| Boeing B-737-400 .....                 | 742                           | —                    | —     | —     | 100   | —    | —     |
| Boeing B-737-500 .....                 | 550                           | —                    | —     | —     | 100   | —    | —     |
| Boeing B-747 <sup>a</sup> .....        | 1,468                         | 46                   | 45    | 10    | —     | —    | —     |
| Boeing B-747-100 .....                 | 592                           | 92                   | —     | 8     | —     | —    | —     |
| Boeing B-747-200B .....                | 788                           | 69                   | 16    | 15    | —     | —    | —     |
| Boeing B-747-400 .....                 | 1,016                         | 39                   | 33    | 29    | —     | —    | —     |
| Boeing B-757 <sup>a</sup> .....        | 152                           | 47                   | —     | 53    | —     | —    | —     |
| Boeing B-757-200 .....                 | 1,142                         | 44                   | —     | 56    | —     | —    | —     |
| Boeing B-767 <sup>a</sup> .....        | 352                           | 30                   | 70    | —     | —     | —    | —     |
| Boeing B-767-200ER .....               | 248                           | 49                   | 51    | —     | —     | —    | —     |
| Boeing B-767-300ER .....               | 508                           | 39                   | 52    | 9     | —     | —    | —     |

(Continued on next page)

**PERCENT OF CIVIL TURBOJET ENGINE MARKET  
BY MANUFACTURER AND AIRCRAFT MODEL (continued)**  
as of December 1994

| Aircraft<br>Manufacturer<br>and Model  | Total<br>Installed<br>Engines | Engine Manufacturers |     |     |     |     |       |
|--|-------------------------------|----------------------|-----|-----|-----|-----|-------|
|  |                               | P&W                  | GE  | RR  | CFM | IAE | Other |
| Canadair CL 600/601 ...                | 4                             | —%                   | 50% | —%  | —%  | —%  | 50%   |
| Canadair Regional Jet ...              | 98                            | —                    | 100 | —   | —   | —   | —     |
| Cessna 500s .....                      | 78                            | 100                  | —   | —   | —   | —   | —     |
| Cessna 650 .....                       | 14                            | —                    | —   | —   | —   | —   | 100   |
| Convair CV 880/990 ...                 | 8                             | —                    | 100 | —   | —   | —   | —     |
| Dassault Falcon .....                  | 144                           | —                    | 86  | —   | —   | —   | 14    |
| Dassault Mercure 100 ..                | 10                            | 100                  | —   | —   | —   | —   | —     |
| Fokker F-28 <sup>a</sup> .....         | 168                           | —                    | —   | 100 | —   | —   | —     |
| Fokker F-28-4000 .....                 | 210                           | —                    | —   | 100 | —   | —   | —     |
| Fokker 100 .....                       | 504                           | —                    | —   | 100 | —   | —   | —     |
| Gulfstream II/III/IV .....             | 32                            | —                    | —   | 100 | —   | —   | —     |
| IAI 1124 .....                         | 28                            | —                    | —   | —   | —   | —   | 93    |
| Ilyushin IL-62 <sup>a</sup> .....      | 292                           | —                    | —   | —   | —   | —   | 100   |
| Ilyushin IL-62M .....                  | 592                           | —                    | —   | —   | —   | —   | 100   |
| Ilyushin IL-76 <sup>a</sup> .....      | 964                           | —                    | —   | —   | —   | —   | 100   |
| Ilyushin IL-76MD .....                 | 608                           | —                    | —   | —   | —   | —   | 100   |
| Ilyushin IL-86 .....                   | 348                           | —                    | —   | —   | —   | —   | 100   |
| Ilyushin IL-96 .....                   | 36                            | —                    | —   | —   | —   | —   | 100   |
| Learjet 23/24/25 .....                 | 36                            | —                    | 100 | —   | —   | —   | —     |
| Learjet 35/36/55 .....                 | 54                            | —                    | —   | —   | —   | —   | 100   |
| Lockheed JetStar .....                 | 24                            | 83                   | —   | —   | —   | —   | 17    |
| Lockheed L-1011 .....                  | 657                           | —                    | —   | 100 | —   | —   | —     |
| MBB Hansa Jet .....                    | 6                             | —                    | 100 | —   | —   | —   | —     |
| Douglas DC-8 .....                     | 1,096                         | 66                   | —   | —   | 34  | —   | —     |
| Douglas DC-9 <sup>a</sup> .....        | 598                           | 100                  | —   | —   | —   | —   | —     |
| Douglas DC-9-30 .....                  | 1,034                         | 100                  | —   | —   | —   | —   | —     |
| Douglas DC-10 <sup>a</sup> .....       | 309                           | 40                   | 60  | —   | —   | —   | —     |
| Douglas DC-10-10 .....                 | 321                           | —                    | 100 | —   | —   | —   | —     |
| Douglas DC-10-30 .....                 | 432                           | —                    | 100 | —   | —   | —   | —     |
| MDC MD-11 series <sup>a</sup> .....    | 66                            | 14                   | 86  | —   | —   | —   | —     |
| MDC MD-11 <sup>b</sup> .....           | 315                           | 49                   | 51  | —   | —   | —   | —     |
| MDC MD-80s <sup>a</sup> .....          | 146                           | 100                  | —   | —   | —   | —   | —     |
| MDC MD-81 .....                        | 242                           | 100                  | —   | —   | —   | —   | —     |
| MDC MD-82 .....                        | 1,086                         | 100                  | —   | —   | —   | —   | —     |
| MDC MD-83 .....                        | 418                           | 100                  | —   | —   | —   | —   | —     |
| MDC MD-88 .....                        | 306                           | 100                  | —   | —   | —   | —   | —     |
| Rockwell Sabreliner .....              | 2                             | 100                  | —   | —   | —   | —   | —     |
| Tupolev TU-134 <sup>a</sup> .....      | 244                           | —                    | —   | —   | —   | —   | 100   |
| Tupolev TU-134A .....                  | 828                           | —                    | —   | —   | —   | —   | 100   |
| Tupolev TU-154 <sup>a</sup> .....      | 771                           | —                    | —   | —   | —   | —   | 100   |
| Tupolev TU-154B2 .....                 | 933                           | —                    | —   | —   | —   | —   | 100   |
| Tupolev TU-154M .....                  | 525                           | —                    | —   | —   | —   | —   | 100   |
| Tupolev TU-204 .....                   | 20                            | —                    | —   | —   | —   | —   | 100   |
| Yakovlev YAK-40 series <sup>a</sup> .. | 3                             | —                    | —   | —   | —   | —   | 100   |
| Yakovlev YAK-40 <sup>b</sup> .....     | 759                           | —                    | —   | —   | —   | —   | 100   |
| Yakovlev YAK-42 .....                  | 321                           | —                    | —   | —   | —   | —   | 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 = Aerospaziale; BAe = British Aerospace; CFM = CFM International; GE = General Electric;  
IAE = International Aero Engines; IAI = Israel Aircraft Industries; MBB = Messerschmitt Bolkow Blohm;  
MDC = McDonnell Douglas; P&W = Pratt & Whitney; RR = Rolls-Royce.

**ACTIVE<sup>a</sup> U.S. AIR CARRIER FLEET**  
**By Type of Aircraft, Number of Engines and Model**  
**Active as of December 1990–1994**

|                                     | 1990  | 1991  | 1992  | 1993               | 1994  |
|-------------------------------------|-------|-------|-------|--------------------|-------|
| <b>TOTAL</b> .....                  | 6,083 | 6,054 | 7,320 | 7,297 <sup>f</sup> | 7,370 |
| <b>Turbojets—TOTAL</b> .....        | 4,148 | 4,167 | 4,446 | 4,584              | 4,636 |
| <b>Four-Engine—TOTAL</b> .....      | 432   | 410   | 389   | 410                | 420   |
| Boeing 707 .....                    | 25    | 27    | 20    | 13                 | 16    |
| Boeing 747 .....                    | 190   | 184   | 178   | 183                | 186   |
| B.Ae. 146 .....                     | 44    | 17    | 23    | 20                 | 15    |
| McDonnell Douglas DC-8 .....        | 173   | 182   | 168   | 194                | 203   |
| <b>Three-Engine—TOTAL</b> .....     | 1,438 | 1,376 | 1,381 | 1,292              | 1,236 |
| Boeing 727 .....                    | 1,152 | 1,073 | 1,029 | 953                | 906   |
| Lockheed L-1011 .....               | 101   | 100   | 113   | 100                | 86    |
| McDonnell Douglas DC-10/MD-11 ..... | 185   | 203   | 239   | 239                | 244   |
| <b>Twin-Engine—TOTAL</b> .....      | 2,278 | 2,381 | 2,676 | 2,882              | 2,980 |
| Airbus A-300 .....                  | 67    | 63    | 58    | 58                 | 63    |
| Airbus A-310 .....                  | 21    | 42    | 21    | 27                 | 17    |
| Airbus A-320 .....                  | 10    | 35    | 54    | 75                 | 86    |
| Boeing 737 .....                    | 812   | 835   | 915   | 1,013              | 1,012 |
| Boeing 757 .....                    | 199   | 234   | 328   | 375                | 395   |
| Boeing 767 .....                    | 120   | 136   | 170   | 187                | 194   |
| B.Ae. BAC-111 .....                 | 3     | 1     | —     | —                  | —     |
| Canadair CL-600 .....               | —     | —     | —     | 5 <sup>f</sup>     | —     |
| Cessna C500/C501 .....              | —     | —     | 2     | 3                  | —     |
| Cessna C550 .....                   | 7     | —     | —     | —                  | —     |
| Cessna C650 .....                   | —     | —     | 1     | —                  | —     |
| Dassault Falcon .....               | —     | 2     | —     | —                  | —     |
| Fokker F-28 .....                   | 68    | 75    | 117   | 129                | 148   |
| Grumman G-1159 .....                | 1     | 3     | 1     | —                  | —     |
| Gulfstream GIII .....               | —     | —     | —     | —                  | 2     |
| Israel Aircraft 1121 .....          | —     | —     | 1     | —                  | —     |
| Learjet LR-25 .....                 | 1     | 2     | 3     | —                  | —     |
| Learjet LR-35 .....                 | 2     | —     | 3     | 1                  | 2     |
| McDonnell Douglas DC-9/MD-80 .....  | 967   | 953   | 1,002 | 1,009              | 1,061 |
| <b>Turboprops—TOTAL</b> .....       | 1,595 | 1,598 | 1,894 | 1,868              | 1,782 |
| <b>Four-Engine—TOTAL</b> .....      | 88    | 75    | 107   | 102                | 87    |
| Canadair CL44D .....                | 5     | —     | 5     | 1                  | 1     |
| De Havilland DHC-7 .....            | 40    | 33    | 40    | 38                 | 27    |
| Lockheed 188 Electra .....          | 24    | 24    | 44    | 45                 | 41    |
| Lockheed 382 .....                  | 19    | 18    | 18    | 18                 | 18    |
| <b>Twin-Engine—TOTAL</b> .....      | 1,507 | 1,523 | 1,787 | 1,751              | 1,695 |
| Beech BE65 .....                    | —     | —     | 16    | —                  | —     |
| Beech BE90 .....                    | —     | —     | 1     | 3                  | 1     |
| Beech BE95 .....                    | —     | —     | —     | —                  | 1     |
| Beech BE99 .....                    | 54    | 32    | 39    | 29                 | 41    |
| Beech BE100 .....                   | 2     | 1     | 4     | 1                  | 1     |

(Continued on next page)

**ACTIVE<sup>a</sup> U.S. AIR CARRIER FLEET (Continued)**

By Type of Aircraft, Number of Engines, and Model  
Active as of December 1990–1994

|  | 1990 | 1991 | 1992 | 1993 | 1994 |
|--|------|------|------|------|------|
| <b>Twin-Engine (continued)</b>                         |      |      |      |      |      |
| Beech BE200 .....                                      | 16   | 8    | 11   | 9    | 7    |
| Beech BE1900 .....                                     | 147  | 167  | 231  | 251  | 281  |
| B.Ae. ATP .....  | 4    | 10   | 10   | 9    | 9    |
| B.Ae. Jetstream .....                                  | 222  | 214  | 240  | 247  | 237  |
| CASA C212 Aviocar .....                                | 16   | 13   | —    | 1    | 1    |
| Cessna C425 .....                                      | —    | —    | 1    | 2    | —    |
| Cessna C441 .....                                      | 2    | 2    | 2    | —    | 2    |
| Convair 580/600/640 .....                              | 33   | 37   | 19   | 16   | 29   |
| DeHavilland DHC-6 .....                                | 67   | 69   | 74   | 67   | 53   |
| DeHavilland DHC-8 .....                                | 74   | 81   | 115  | 120  | 142  |
| Dornier DO228 .....                                    | 32   | 31   | 13   | 13   | 7    |
| Embraer EMB110 .....                                   | 48   | 23   | 16   | 14   | 15   |
| Embraer EMB120 .....                                   | 156  | 167  | 195  | 217  | 223  |
| Fairchild/Fokker F-27/FH-227 ...                       | 58   | 50   | 53   | 50   | 37   |
| Grumman G-73 .....                                     | 7    | 4    | 5    | —    | 5    |
| Grumman G-159 .....                                    | 7    | 2    | 1    | —    | —    |
| McKinnon G-21 .....                                    | —    | —    | —    | 2    | 2    |
| Mitsubishi MU-2 .....                                  | 1    | 1    | 10   | —    | —    |
| Nihon YS-11 .....                                      | 21   | 22   | 31   | 25   | 25   |
| Nord ND-262/STC-262 .....                              | 1    | —    | 1    | —    | —    |
| Piper PA31T .....                                      | 8    | 8    | 99   | 79   | 1    |
| Piper 42 .....   | —    | 1    | 1    | —    | 1    |
| Saab-Fairchild SF340A .....                            | 109  | 153  | 195  | 209  | 202  |
| Shorts SC-7 .....                                      | —    | 2    | 6    | 6    | 5    |
| Shorts SD-3/5D-330 .....                               | 103  | 93   | 88   | 74   | 63   |
| SNAIS ATR-42 .....                                     | 77   | 101  | 108  | 108  | 111  |
| SNAIS ATR-72 .....                                     | —    | —    | 14   | 27   | 44   |
| Swearingen SA-226 .....                                | 22   | 31   | 14   | 14   | 11   |
| Swearingen SA-227 .....                                | 218  | 200  | 174  | 158  | 138  |
| <b>Single-Engine—TOTAL</b> .....                       | NA   | NA   | NA   | 15   | —    |
| <b>Piston-Engine—TOTAL</b> .....                       | 329  | 283  | 847  | 721  | 824  |
| <b>Four-Engine—TOTAL</b> .....                         | 31   | 26   | 20   | 22   | 19   |
| Douglas DC-6 .....                                     | 30   | 25   | 19   | 21   | 18   |
| Douglas DC-7 .....                                     | 1    | 1    | 1    | 1    | 1    |
| <b>Three-Engine—TOTAL</b> .....                        | 6    | 5    | 5    | —    | 5    |
| Pilatus Britten-Norman<br>BN2A-MK-3 Turbo Islander ... | 6    | 5    | 5    | —    | 5    |
| <b>Twin-Engine—TOTAL</b> .....                         | 292  | 252  | 415  | 293  | 335  |
| <b>Single-Engine—TOTAL</b> .....                       | NA   | NA   | 407  | 406  | 465  |
| <b>Helicopters—TOTAL</b> .....                         | 11   | 6    | 133  | 124  | 128  |

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

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

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

NA Not Available.

r Revised.

**JET FUEL COSTS AND CONSUMPTION BY U.S. AIR CARRIERS<sup>a</sup>**  
**Calendar Years 1977-1994**

| Year              | Gallons Consumed (Millions) | Total Cost (Millions) | Cost Per Gallon (Cents) | Cost Index (1982 = 100) | Cost of Fuel as Percent of Cash Operating Expenses |
|-------------------|-----------------------------|-----------------------|-------------------------|-------------------------|--|
| 1977              | 10,282.0                    | \$ 3,729.8            | 36.3¢                   | 37.0                    | 20.1 %   |
| 1978              | 10,627.1                    | 4,178.2               | 39.3                    | 40.1                    | 19.7   |
| 1979              | 11,278.1                    | 6,503.0               | 57.7                    | 58.8                    | 24.4   |
| 1980              | 10,874.0                    | 9,769.5               | 89.8                    | 91.6                    | 29.7   |
| 1981              | 10,087.8                    | 10,498.0              | 104.1                   | 106.1                   | 29.3   |
| 1982              | 9,942.1                     | 9,755.2               | 98.1                    | 100.0                   | 27.4 <sup>r</sup>                                  |
| 1983              | 10,214.4                    | 9,073.1               | 88.8                    | 90.5                    | 24.5   |
| 1984              | 11,050.4                    | 9,361.7               | 84.7                    | 86.3                    | 23.8   |
| 1985              | 11,675.1                    | 9,326.7               | 79.9                    | 81.4                    | 22.2   |
| 1986              | 12,643.0                    | 6,995.8               | 55.3                    | 56.4                    | 16.3   |
| 1987              | 13,629.5                    | 7,593.8               | 55.7                    | 56.8                    | 16.0   |
| 1988              | 14,204.8                    | 7,557.2               | 53.2                    | 54.2                    | 14.4   |
| 1989              | 14,103.9                    | 8,472.7               | 60.1                    | 61.2                    | 14.9   |
| 1990              | 14,841.1                    | 11,465.2              | 77.3                    | 78.7                    | 17.6   |
| 1991              | 13,798.4                    | 9,329.5               | 67.6                    | 68.9                    | 14.8   |
| 1992              | 14,172.0                    | 8,907.9               | 62.9                    | 64.1                    | 13.5   |
| 1993 <sup>r</sup> | 14,165.0                    | 8,452.9               | 59.7                    | 60.8                    | 12.7   |
| 1994              | 14,153.4                    | 7,722.7               | 54.6                    | 55.6                    | 11.7   |

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

**U.S. CIVIL AND JOINT-USE AIRCRAFT FACILITIES<sup>a</sup>**  
**BY TYPE AND STATE**  
**As of December 31, 1994**

| State             | TOTAL <sup>a</sup> | Public <sup>b</sup> | Paved | Lighted | State                         | TOTAL <sup>a</sup> | Public <sup>b</sup> | Paved        | Lighted      |
|-------------------|--------------------|---------------------|-------|---------|-------------------------------|--------------------|---------------------|--------------|--------------|
| Alabama .....     | 236                | 100                 | 152   | 99      | Nevada .....                  | 127                | 61                  | 62           | 33           |
| Alaska .....      | 545                | 408                 | 64    | 155     | New Hampshire .               | 94                 | 27                  | 50           | 18           |
| Arizona .....     | 278                | 75                  | 159   | 73      | New Jersey .....              | 352                | 54                  | 155          | 49           |
| Arkansas .....    | 254                | 101                 | 171   | 92      | New Mexico .....              | 171                | 70                  | 82           | 48           |
| California .....  | 946                | 267                 | 680   | 247     | New York .....                | 540                | 169                 | 219          | 131          |
| Colorado .....    | 396                | 85                  | 181   | 85      | North Carolina ..             | 355                | 118                 | 155          | 114          |
| Connecticut ..    | 138                | 26                  | 87    | 27      | North Dakota ...              | 438                | 96                  | 88           | 97           |
| Delaware .....    | 36                 | 10                  | 13    | 12      | Ohio .....                    | 741                | 189                 | 290          | 187          |
| Dist. of Col. ... | 17                 | 2                   | 16    | 4       | Oklahoma .....                | 416                | 156                 | 217          | 133          |
| Florida .....     | 783                | 131                 | 338   | 145     | Oregon .....                  | 397                | 102                 | 161          | 77           |
| Georgia .....     | 405                | 111                 | 197   | 116     | Pennsylvania ....             | 783                | 149                 | 325          | 138          |
| Hawaii .....      | 48                 | 13                  | 40    | 14      | Rhode Island ....             | 26                 | 8                   | 19           | 7            |
| Idaho .....       | 220                | 120                 | 79    | 47      | South Carolina ..             | 164                | 69                  | 80           | 64           |
| Illinois .....    | 900                | 135                 | 286   | 161     | South Dakota ...              | 157                | 75                  | 67           | 74           |
| Indiana .....     | 600                | 113                 | 170   | 119     | Tennessee .....               | 251                | 85                  | 149          | 86           |
| Iowa .....        | 298                | 123                 | 171   | 140     | Texas .....                   | 1,671              | 391                 | 825          | 420          |
| Kansas .....      | 387                | 148                 | 137   | 131     | Utah .....                    | 124                | 47                  | 83           | 45           |
| Kentucky .....    | 182                | 68                  | 112   | 58      | Vermont .....                 | 73                 | 16                  | 17           | 11           |
| Louisiana .....   | 433                | 89                  | 250   | 78      | Virginia .....                | 372                | 69                  | 160          | 85           |
| Maine .....       | 152                | 74                  | 52    | 33      | Washington .....              | 427                | 133                 | 213          | 134          |
| Maryland .....    | 203                | 41                  | 79    | 48      | West Virginia ...             | 107                | 40                  | 64           | 32           |
| Massachusetts ..  | 229                | 52                  | 125   | 43      | Wisconsin .....               | 490                | 140                 | 178          | 139          |
| Michigan .....    | 470                | 228                 | 195   | 182     | Wyoming .....                 | 103                | 41                  | 53           | 37           |
| Minnesota .....   | 478                | 159                 | 145   | 140     | <b>50 States—Total</b> .      | <b>18,267</b>      | <b>5,433</b>        | <b>8,181</b> | <b>4,807</b> |
| Mississippi ...   | 221                | 84                  | 126   | 81      | Puerto Rico .....             | 31                 | 11                  | 27           | 10           |
| Missouri .....    | 494                | 146                 | 228   | 140     | Virgin Islands ...            | 9                  | 2                   | 3            | 2            |
| Montana .....     | 237                | 122                 | 102   | 87      | S. Pacific <sup>c</sup> ..... | 36                 | 28                  | 19           | 11           |
| Nebraska .....    | 302                | 97                  | 114   | 90      | <b>TOTAL</b> .....            | <b>18,343</b>      | <b>5,474</b>        | <b>8,230</b> | <b>4,830</b> |

**FACILITIES BY CLASS**

| Class                         | Total <sup>a</sup> | Public <sup>b</sup> | Private       |
|-------------------------------|--------------------|---------------------|---------------|
| Airports .....                | 13,202             | 5,181               | 8,021         |
| Heliports .....               | 4,617              | 92                  | 4,525         |
| Stolports .....               | 81                 | 5                   | 76            |
| Seaplane Bases .....          | 443                | 196                 | 247           |
| <b>Total Facilities</b> ..... | <b>18,343</b>      | <b>5,474</b>        | <b>12,869</b> |

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

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

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

c American Samoa, Guam, and Trust Territories.



**HELIPORTS/HELIPADS<sup>a</sup> IN THE UNITED STATES  
BY STATE  
As of 1994**

| State                    | Total<br>Helipads<br>in State | Private Use              |                         | Public Use               |                         |
|--------------------------|-------------------------------|--------------------------|-------------------------|--------------------------|-------------------------|
|                          |                               | Heliports &<br>Helistops | Helipads<br>at Airports | Heliports &<br>Helistops | Helipads<br>at Airports |
| Alabama .....            | 69                            | 67                       | —                       | 1                        | 1                       |
| Alaska .....             | 27                            | 15                       | 1                       | 8                        | 3                       |
| Arizona .....            | 95                            | 91                       | —                       | —                        | 4                       |
| Arkansas .....           | 76                            | 73                       | 1                       | —                        | 2                       |
| California .....         | 402                           | 384                      | 3                       | —                        | 15                      |
| Colorado .....           | 170                           | 166                      | 1                       | —                        | 3                       |
| Connecticut .....        | 81                            | 74                       | 1                       | 2                        | 4                       |
| Delaware .....           | 13                            | 11                       | —                       | 1                        | 1                       |
| District of Columbia ... | 19                            | 19                       | —                       | —                        | —                       |
| Florida .....            | 253                           | 250                      | 1                       | 1                        | 1                       |
| Georgia .....            | 105                           | 104                      | —                       | —                        | 1                       |
| Hawaii .....             | 17                            | 15                       | —                       | —                        | 2                       |
| Idaho .....              | 30                            | 28                       | 1                       | —                        | 1                       |
| Illinois .....           | 239                           | 225                      | 3                       | 11                       | —                       |
| Indiana .....            | 113                           | 107                      | 3                       | 2                        | 1                       |
| Iowa .....               | 80                            | 79                       | —                       | —                        | 1                       |
| Kansas .....             | 35                            | 31                       | —                       | —                        | 4                       |
| Kentucky .....           | 43                            | 43                       | —                       | —                        | —                       |
| Louisiana .....          | 224                           | 217                      | 2                       | 4                        | 1                       |
| Maine .....              | 16                            | 15                       | —                       | —                        | 1                       |
| Maryland .....           | 55                            | 50                       | 1                       | 3                        | 1                       |
| Massachusetts .....      | 131                           | 126                      | —                       | 2                        | 3                       |
| Michigan .....           | 75                            | 73                       | 1                       | 1                        | —                       |
| Minnesota .....          | 42                            | 37                       | 1                       | —                        | 4                       |
| Mississippi .....        | 43                            | 43                       | —                       | —                        | —                       |
| Missouri .....           | 116                           | 108                      | 1                       | 4                        | 3                       |
| Montana .....            | 21                            | 19                       | —                       | 2                        | —                       |
| Nebraska .....           | 28                            | 26                       | 1                       | —                        | 1                       |
| Nevada .....             | 25                            | 25                       | —                       | —                        | —                       |
| New Hampshire .....      | 42                            | 41                       | —                       | —                        | 1                       |

(Continued on next page)

**HELIPORTS/HELIPADS<sup>a</sup> IN THE UNITED STATES  
BY STATE (Continued)**

As of 1994

| State                   | Total<br>Helipads<br>in State | Private Use              |                         | Public Use               |                         |
|-------------------------|-------------------------------|--------------------------|-------------------------|--------------------------|-------------------------|
|                         |                               | Heliports &<br>Helistops | Helipads<br>at Airports | Heliports &<br>Helistops | Helipads<br>at Airports |
| New Jersey .....        | 233                           | 228                      | —                       | 3                        | 2                       |
| New Mexico .....        | 21                            | 18                       | 1                       | 2                        | —                       |
| New York .....          | 137                           | 125                      | —                       | 9                        | 3                       |
| North Carolina .....    | 61                            | 59                       | —                       | 2                        | —                       |
| North Dakota .....      | 13                            | 13                       | —                       | —                        | —                       |
| Ohio .....              | 201                           | 180                      | 1                       | 16                       | 4                       |
| Oklahoma .....          | 86                            | 82                       | —                       | 4                        | —                       |
| Oregon .....            | 88                            | 83                       | 2                       | 3                        | —                       |
| Pennsylvania .....      | 284                           | 273                      | 1                       | 8                        | 2                       |
| Rhode Island .....      | 16                            | 15                       | —                       | 1                        | —                       |
| South Carolina .....    | 27                            | 25                       | —                       | —                        | 2                       |
| South Dakota .....      | 12                            | 12                       | —                       | —                        | —                       |
| Tennessee .....         | 82                            | 76                       | 2                       | 3                        | 1                       |
| Texas .....             | 413                           | 394                      | 3                       | 10                       | 6                       |
| Utah .....              | 39                            | 36                       | —                       | —                        | 3                       |
| Vermont .....           | 17                            | 17                       | —                       | —                        | —                       |
| Virginia .....          | 115                           | 111                      | —                       | —                        | 4                       |
| Washington .....        | 103                           | 97                       | 3                       | 1                        | 2                       |
| West Virginia .....     | 32                            | 29                       | —                       | —                        | 3                       |
| Wisconsin .....         | 68                            | 68                       | —                       | —                        | —                       |
| Wyoming .....           | 16                            | 15                       | —                       | —                        | 1                       |
| <b>Total U.S.</b> ..... | <b>4,749</b>                  | <b>4,518</b>             | <b>35</b>               | <b>104</b>               | <b>92</b>               |

Source: Helicopter Association International, "1995 Helicopter Annual" (Annually).

NOTE: 95.9 percent of all U.S. helicopter landing areas are private, while 4.1 percent are public.

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

**ACTIVE U.S. CIVIL AIRCRAFT<sup>a</sup>**

As of December 31, 1963–1993

(in thousands)

| Year | TOTAL | Air Carrier <sup>b</sup> | General Aviation Aircraft |                     |                |                |                         |                    |
|------|-------|--------------------------|---------------------------|---------------------|----------------|----------------|-------------------------|--------------------|
|      |       |                          | TOTAL                     | Fixed-Wing Aircraft |                |                | Rotorcraft <sup>c</sup> | Other <sup>d</sup> |
|      |       |                          |                           | Multi-Engine        | Single-Engine  |                |                         |                    |
|      |       |                          |                           |                     | 4-place & over | 3-place & less |                         |                    |
| 1963 | 87.2  | 2.079                    | 85.1                      | 9.7                 | 42.6           | 31.0           | 1.2                     | 0.6                |
| 1964 | 90.8  | 2.057                    | 88.7                      | 10.6                | 45.8           | 30.4           | 1.3                     | 0.6                |
| 1965 | 97.6  | 2.125                    | 95.4                      | 12.0                | 49.8           | 31.4           | 1.5                     | 0.8                |
| 1966 | 107.0 | 2.272                    | 104.7                     | 13.5                | 53.0           | 35.7           | 1.6                     | 0.9                |
| 1967 | 116.6 | 2.452                    | 114.2                     | 14.7                | 56.9           | 39.7           | 1.9                     | 1.1                |
| 1968 | 126.8 | 2.586                    | 124.2                     | 16.8                | 61.0           | 42.8           | 2.4                     | 1.3                |
| 1969 | 133.5 | 2.690                    | 130.8                     | 18.1                | 63.7           | 45.0           | 2.6                     | 1.4                |
| 1970 | 134.4 | 2.679                    | 131.7                     | 18.3                | 64.8           | 44.9           | 2.3                     | 1.6                |
| 1971 | 133.8 | 2.642                    | 131.1                     | 17.9                | 64.5           | 44.8           | 2.4                     | 1.7                |
| 1972 | 147.6 | 2.583                    | 145.0                     | 19.8                | 71.0           | 49.4           | 2.8                     | 1.9                |
| 1973 | 156.1 | 2.599                    | 153.5                     | 21.9                | 74.8           | 51.4           | 3.1                     | 2.3                |
| 1974 | 164.0 | 2.472                    | 161.5                     | 23.4                | 78.9           | 53.0           | 3.6                     | 2.5                |
| 1975 | 171.0 | 2.495                    | 168.5                     | 24.6                | 82.6           | 54.4           | 4.1                     | 2.8                |
| 1976 | 180.8 | 2.492                    | 178.3                     | 25.7                | 88.2           | 56.7           | 4.5                     | 3.2                |
| 1977 | 186.8 | 2.473                    | 184.3                     | 26.7                | 92.0           | 57.3           | 4.7                     | 3.6                |
| 1978 | 201.3 | 2.545                    | 198.8                     | 28.8                | 101.5          | 59.2           | 5.3                     | 4.0                |
| 1979 | 213.9 | 3.609                    | 210.3                     | 31.3                | 106.0          | 62.4           | 5.9                     | 4.8                |
| 1980 | 214.9 | 3.808                    | 211.0                     | 31.7                | 107.9          | 60.5           | 6.0                     | 4.9                |
| 1981 | 217.2 | 3.973                    | 213.2                     | 33.3                | 108.0          | 59.9           | 7.0                     | 5.0                |
| 1982 | 213.9 | 4.027                    | 209.8                     | 34.2                | 106.5          | 57.7           | 6.2                     | 6.2                |
| 1983 | 217.5 | 4.203                    | 213.3                     | 34.6                | 107.1          | 59.1           | 6.5                     | 5.9                |
| 1984 | 225.3 | 4.370                    | 220.9                     | 35.6                | 109.9          | 62.0           | 7.1                     | 6.3                |
| 1985 | 201.2 | 4.678                    | 196.5                     | 31.3                | 98.5           | 54.9           | 6.0                     | 5.8                |
| 1986 | 210.2 | 4.909                    | 205.3                     | 32.0                | 102.0          | 58.3           | 6.5                     | 6.5                |
| 1987 | 208.0 | 5.253                    | 202.7                     | 30.8                | 100.4          | 59.3           | 5.9                     | 6.3                |
| 1988 | 201.9 | 5.660                    | 196.2                     | 30.1                | 98.1           | 55.6           | 6.0                     | 6.4                |
| 1989 | 210.8 | 5.778                    | 205.0                     | 31.9                | 100.5          | 58.4           | 7.0                     | 7.2                |
| 1990 | 204.1 | 6.083                    | 198.0                     | 30.5                | 97.6           | 56.4           | 6.9                     | 6.6                |
| 1991 | 204.6 | 6.054                    | 198.5                     | 30.5                | 98.5           | 55.7           | 6.3                     | 7.6                |
| 1992 | 191.7 | 7.320                    | 184.4                     | 27.3                | 91.0           | 52.5           | 5.8                     | 7.8                |
| 1993 | 183.3 | 7.297                    | 176.0                     | 23.9                | 89.4           | 41.3           | 4.5                     | 16.2               |

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

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

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

c Includes autogiros; excludes air carrier helicopters.

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

**ACTIVE U.S. CIVIL AIRCRAFT  
BY PRIMARY USE AND TYPE OF AIRCRAFT**  
As of December 31, 1993

| Primary Use <sup>a</sup>        | TOTAL          | Fixed-Wing   |              |                | Rotor-<br>craft <sup>b</sup> | Other <sup>c</sup> |
|---------------------------------|----------------|--------------|--------------|----------------|------------------------------|--------------------|
|                                 |                | Turbojet     | Turboprop    | Piston         |                              |                    |
| <b>TOTAL—ALL AIRCRAFT ...</b>   | <b>183,303</b> | <b>8,443</b> | <b>6,227</b> | <b>147,815</b> | <b>4,634</b>                 | <b>16,185</b>      |
| <b>Air Carrier—TOTAL .....</b>  | <b>7,297</b>   | <b>4,584</b> | <b>1,868</b> | <b>721</b>     | <b>124</b>                   | <b>—</b>           |
| Large .....                     | 5,319          | 4,575        | 670          | 74             | —                            | —                  |
| Small .....                     | 1,978          | 9            | 1,198        | 647            | 124                          | —                  |
| <b>General Aviation—TOTAL .</b> | <b>176,006</b> | <b>3,859</b> | <b>4,359</b> | <b>147,094</b> | <b>4,510</b>                 | <b>16,185</b>      |
| Executive .....                 | 9,855          | 3,242        | 2,540        | 3,388          | 508                          | 179                |
| Business .....                  | 27,811         | 106          | 380          | 26,270         | 318                          | 738                |
| Air Taxi <sup>d</sup> .....     | 3,764          | 294          | 552          | 2,338          | 580                          | —                  |
| Instructional .....             | 15,608         | 11           | 53           | 14,654         | 430                          | 458                |
| Personal .....                  | 102,146        | 65           | 326          | 89,053         | 487                          | 12,215             |
| Aerial Application .....        | 4,979          | —            | 288          | 4,154          | 470                          | 67                 |
| Aerial Observation .....        | 4,804          | 2            | 13           | 3,585          | 969                          | 235                |
| Sight Seeing .....              | 1,626          | —            | 5            | 551            | 241                          | 828                |
| External Load .....             | 147            | —            | —            | —              | 144                          | 3                  |
| Other Work .....                | 1,039          | —            | 12           | 774            | 29                           | 224                |
| Other .....                     | 4,228          | 140          | 190          | 2,326          | 335                          | 1,238              |

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

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

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

b Includes helicopters and autogiros.

c Includes gliders, dirigibles, and balloons.

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

**U.S. GENERAL AVIATION  
TYPE OF AIRCRAFT AND HOURS FLOWN**  
Calendar Years 1989–1993

|   | 1989          | 1990          | 1991          | 1992          | 1993 <sup>a</sup> |
|---|---------------|---------------|---------------|---------------|-------------------|
| <b>Number of Active Aircraft by Type (in thousands)</b> |               |               |               |               |                   |
| <b>All Aircraft—TOTAL</b> .....                         | <u>205.0</u>  | <u>198.0</u>  | <u>198.5</u>  | <u>184.4</u>  | <u>176.0</u>      |
| Fixed-Wing: .....                                       | 190.8         | 184.5         | 184.6         | 170.8         | 155.3             |
| Piston: .....   | 180.8         | 175.2         | 175.3         | 162.1         | 147.1             |
| Single-Engine .....                                     | 158.9         | 154.0         | 154.1         | 143.6         | 130.7             |
| Twin-Engine .....                                       | 21.8          | 21.1          | 21.1          | 18.5          | 16.4              |
| Other .....   | 0.1           | 0.1           | 0.1           | 0.1           | 0.0               |
| Turboprop: .....  | 5.9           | 5.3           | 4.9           | 4.7           | 4.4               |
| Twin-Engine .....                                       | 5.7           | 4.9           | 4.4           | 4.1           | 3.6               |
| Other .....   | 0.2           | 0.4           | 0.5           | 0.6           | 0.8               |
| Turbojet: .....   | 4.1           | 4.1           | 4.4           | 4.0           | 3.9               |
| Twin-Engine .....                                       | 3.7           | 3.7           | 4.1           | 3.8           | 3.7               |
| Other .....   | 0.4           | 0.4           | 0.3           | 0.2           | 0.2               |
| Rotorcraft: .....                                       | 7.0           | 6.9           | 6.3           | 5.8           | 4.5               |
| Piston .....  | 3.0           | 3.2           | 2.5           | 2.2           | 1.6               |
| Turbine .....   | 4.0           | 3.7           | 3.8           | 3.5           | 2.9               |
| Balloons, Dirigibles, and Gliders ..                    | 7.2           | 6.6           | 6.7           | 7.8           | 5.2               |
| Experimental .....                                      | NA            | NA            | NA            | NA            | 10.9              |
| <b>Hours Flown by Type of Aircraft (in thousands)</b>   |               |               |               |               |                   |
| <b>All Aircraft—TOTAL</b> .....                         | <u>32,332</u> | <u>32,096</u> | <u>30,067</u> | <u>26,493</u> | <u>24,340</u>     |
| Fixed-Wing: Piston .....                                | 24,907        | 25,832        | 24,102        | 21,251        | 19,029            |
| Turboprop .....   | 2,892         | 2,319         | 1,513         | 1,478         | 1,227             |
| Turbojet .....  | 1,527         | 1,396         | 1,236         | 1,072         | 1,165             |
| Rotorcraft: Piston .....                                | 692           | 716           | 585           | 416           | 370               |
| Turbine .....   | 1,918         | 1,493         | 2,172         | 1,866         | 1,462             |
| Balloons, Dirigibles, and Gliders ..                    | 396           | 341           | 459           | 410           | 376               |
| Experimental .....                                      | NA            | NA            | NA            | NA            | 711               |
| <b>Average Hours Flown Annually by Type</b>             |               |               |               |               |                   |
| <b>All Aircraft—TOTAL</b> .....                         | <u>157.7</u>  | <u>162.1</u>  | <u>149.1</u>  | <u>140.4</u>  | <u>138.3</u>      |
| Fixed-Wing: Piston .....                                | 137.8         | 147.4         | 137.5         | 130.4         | 129.4             |
| Turboprop .....   | 490.2         | 437.5         | 307.7         | 314.1         | 281.4             |
| Turbojet .....  | 372.5         | 340.6         | 289.7         | 270.7         | 302.0             |
| Rotorcraft: Piston .....                                | 230.6         | 223.7         | 233.7         | 184.6         | 224.8             |
| Turbine .....   | 479.5         | 403.6         | 592.2         | 491.3         | 510.5             |
| Balloons, Dirigibles, and Gliders ..                    | 55.0          | 51.6          | 61.4          | 50.9          | 71.6              |
| Experimental .....                                      | NA            | NA            | NA            | NA            | 65.0              |

Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Annually) and the Federal Aviation Administration, Office of Management Systems.

NOTE: Detail may not add to totals because of rounding and/or estimating procedures.

<sup>a</sup> Beginning in 1993, commuters were excluded from the survey.

NA Not available.

**U.S. GENERAL AVIATION  
ACTIVE AIRCRAFT AND HOURS FLOWN  
BY PRIMARY USE  
Calendar Years 1989–1993**

| Primary Use <sup>a</sup>                                | 1989          | 1990          | 1991          | 1992          | 1993          |
|---|---------------|---------------|---------------|---------------|---------------|
| <b>ACTIVE AIRCRAFT AS OF DECEMBER 31 (in thousands)</b> |               |               |               |               |               |
| <b>TOTAL</b> .....                                      | <u>205.0</u>  | <u>198.0</u>  | <u>198.5</u>  | <u>184.4</u>  | <u>176.0</u>  |
| Executive .....   | 11.5          | 10.1          | 10.0          | 9.4           | 9.9           |
| Business .....  | 35.0          | 33.1          | 31.6          | 28.9          | 27.8          |
| Commuter <sup>b</sup> .....                             | 1.3           | 1.2           | 0.7           | 0.8           | (c)           |
| Air Taxi <sup>b</sup> .....                             | 6.6           | 5.8           | 5.5           | 4.7           | 3.8           |
| Instructional .....                                     | 16.6          | 18.6          | 17.9          | 16.0          | 15.6          |
| Personal .....  | 116.4         | 112.6         | 115.1         | 108.7         | 102.1         |
| Aerial Application .....                                | 6.6           | 6.2           | 7.0           | 5.1           | 5.0           |
| Aerial Observation .....                                | 5.4           | 4.9           | 5.1           | 5.6           | 4.8           |
| Sight Seeing .....                                      | NA            | NA            | NA            | NA            | 1.6           |
| External Load .....                                     | NA            | NA            | NA            | NA            | 0.1           |
| Other Work .....  | 2.0           | 1.4           | 1.7           | 1.7           | 1.0           |
| Other .....   | 3.6           | 4.1           | 3.9           | 3.5           | 4.2           |
| <b>HOURS FLOWN (in thousands)</b>                       |               |               |               |               |               |
| <b>TOTAL</b> .....                                      | <u>32,332</u> | <u>32,096</u> | <u>30,067</u> | <u>26,493</u> | <u>24,340</u> |
| Executive .....   | 3,453         | 2,913         | 2,617         | 2,262         | 2,659         |
| Business .....  | 4,330         | 4,417         | 4,154         | 3,537         | 3,345         |
| Commuter <sup>b</sup> .....                             | 1,392         | 1,333         | 570           | 693           | (c)           |
| Air Taxi <sup>b</sup> .....                             | 3,020         | 2,249         | 2,241         | 2,009         | 1,452         |
| Instructional .....                                     | 5,993         | 7,244         | 6,141         | 5,340         | 4,680         |
| Personal .....  | 9,537         | 9,276         | 9,685         | 8,592         | 7,938         |
| Aerial Application .....                                | 1,868         | 1,872         | 1,911         | 1,296         | 1,167         |
| Aerial Observation .....                                | 1,719         | 1,745         | 1,797         | 1,730         | 1,750         |
| Sight Seeing .....                                      | NA            | NA            | NA            | NA            | 412           |
| External Load .....                                     | NA            | NA            | NA            | NA            | 105           |
| Other Work .....  | 517           | 572           | 471           | 343           | 175           |
| Other .....   | 507           | 475           | 473           | 358           | 656           |

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

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

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

b Limited to single-engine commuters or air taxis under 12,500 pounds.

c Beginning in 1993, commuters were excluded from the survey.

NA Not available.

# Research and Development



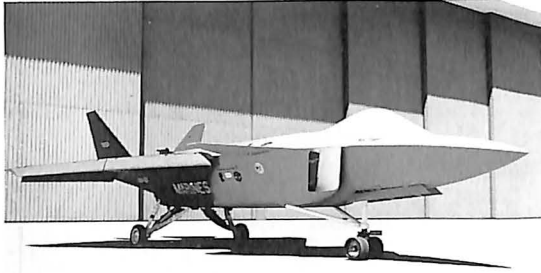
**D**espite government emphasis on deficit trimming and defense funding reductions, total federal outlays for research and development (R&D) increased from \$68.4 billion in 1993 to \$68.5 billion in 1994. The Office of Management and Budget (OMB) estimates Fiscal Year (FY) 1995 total federal outlays for R&D at \$68.9 billion. In inflation-adjusted constant dollar terms, however, federal R&D support has been declining since 1993.

For FY 1996, OMB estimates total outlays at \$69.4 billion, which would amount to a small increase in current dollars but a continued, moderate decrease in constant dollars. The Department of Defense (DoD), at \$35.2 billion (current dollars), will spend more than half of the total; that figure is down slightly from FY 1995 outlays. National Aeronautics and Space Administration outlays are estimated at \$8.7 billion (down \$62 million). Planned

Department of Energy outlays are \$6.3 billion, up from \$6.1 billion. All other government agencies will invest \$19.2 billion in R&D, up from \$18.3 billion.

In calendar year 1994, U.S. funding for R&D amounted to \$169.1 billion, up from \$165.8 billion in the previous year, according to the National Science Foundation's (NSF) annual survey. Industry funding, at \$99.7 billion, represented 59 percent of the total; federal outlays (\$61 billion) were more than 36 percent; colleges and universities (\$5.4 billion) were three percent; and nonprofit institutions (\$3.1 billion) were less than two percent. The great bulk of the R&D was performed by industry (71 percent).

For 1995, NSF estimated total R&D funding from all sources at \$171 billion with industry funding \$101.7 billion, again 59 percent of the total.



Calendar year 1993 is the latest year for which NSF is able to supply data on aerospace industrial R&D. In that year, total aerospace industrial R&D funding amounted to \$15.6 billion, \$9.4 billion of it from federal funding and \$6.2 billion funded by aerospace companies. The total represents a sharp drop from the prior year's \$17.2 billion.

With respect to R&D funding as a percentage of net sales, the aerospace industry recorded significantly higher percentages than the average for all U.S. manufacturing industries. Aerospace federal and company investment in R&D amounted to 13.2 percent of net sales in 1993; that compares with 3.8 percent for all manufacturing industries. Company funding as a percentage of net sales came to 5.2 percent; the all-industry average was 3.1 percent.

In FY 1994, DoD prime contract awards for Research, Develop-

ment, Test, and Evaluation (RDT&E) totaled \$21.8 billion, down from \$22.3 billion in the previous year. The largest single category of awards was for aircraft at \$5.8 billion. Principal aircraft programs in FY 1994 were the Air Force's F-22 advanced technology fighter at \$2.1 billion; the Navy F/A-18 fighter, \$1.5 billion; the USAF B-2 bomber, \$776 million; and the Army RAH-66 Comanche helicopter, \$365 million. The same four programs, plus the Navy/Marine Corps V-22 Osprey, were the top five for FY 1995. DoD estimates for aircraft RDT&E in FY 1996 show the F-22 heading the list at \$2.1 billion, followed by the F/A-18, \$920 million; the V-22, \$763 million; the B-2, \$624 million; and the RAH-66, \$199 million. Outlays for the co-funded USAF/Navy Joint Advanced Strike Technology fighter are estimated at \$331 million.

In a geographical breakdown of FY 1994 DoD prime contract awards for RDT&E, the South Atlantic region (\$5.7 billion, 26.9 percent of the total) took over first place from the perennial leader, the Pacific Region (\$4.4 billion, 20.5 percent). The New England region (\$2.3 billion, 10.6 percent) placed third and the Mountain region (\$2.2 billion, 10.2 percent) fourth.



**TOTAL U.S. FUNDS FOR RESEARCH AND DEVELOPMENT  
BY SOURCE AND PERFORMER<sup>a</sup>**  
Calendar Years 1992–1995  
(Millions of Dollars)

| Source of Funds                   | TOTAL,<br>All Perform-<br>ers | Performer               |                  |                                    |   |                                     |
|-----------------------------------|-------------------------------|-------------------------|------------------|------------------------------------|---|-------------------------------------|
|                                   |                               | Federal Govern-<br>ment | Indus-<br>try    | Colleges<br>&<br>Univer-<br>sities | Federally-<br>Funded<br>Research<br>& Devel-<br>opment<br>Centers | Non-<br>Profit<br>Insti-<br>tutions |
| <b>1992<sup>r</sup></b>           |                               |                         |                  |                                    |   |                                     |
| <b>All Sources—TOTAL</b> . . .    | <u>\$164,493</u>              | <u>\$15,690</u>         | <u>\$119,110</u> | <u>\$18,794</u>                    | <u>\$5,249</u>  | <u>\$5,650</u>                      |
| Federal Government . . . . .      | 60,301                        | 15,690                  | 24,722           | 11,090                             | 5,249   | 3,550                               |
| Industry . . . . .                | 96,429                        | —                       | 94,388           | 1,291                              | —   | 750                                 |
| Colleges & Universities . . . . . | 5,018                         | —                       | —                | 5,018                              | —   | —                                   |
| Nonprofit Institutions . . . . .  | 2,745                         | —                       | —                | 1,395                              | —   | 1,350                               |
| <b>1993</b>                       |                               |                         |                  |                                    |   |                                     |
| <b>All Sources—TOTAL</b> . . .    | <u>\$165,849</u>              | <u>\$16,556</u>         | <u>\$118,334</u> | <u>\$19,911</u>                    | <u>\$5,298</u>  | <u>\$5,750</u>                      |
| Federal Government . . . . .      | 60,224                        | 16,556                  | 22,813           | 11,957                             | 5,298   | 3,600                               |
| Industry . . . . .                | 97,645                        | —                       | 95,521           | 1,374                              | —   | 750                                 |
| Colleges & Universities . . . . . | 5,111                         | —                       | —                | 5,111                              | —   | —                                   |
| Nonprofit Institutions . . . . .  | 2,869                         | —                       | —                | 1,469                              | —   | 1,400                               |
| <b>1994<sup>p</sup></b>           |                               |                         |                  |                                    |   |                                     |
| <b>All Sources—TOTAL</b> . . .    | <u>\$169,100</u>              | <u>\$17,200</u>         | <u>\$119,700</u> | <u>\$20,950</u>                    | <u>\$5,250</u>  | <u>\$6,000</u>                      |
| Federal Government . . . . .      | 61,050                        | 17,200                  | 22,300           | 12,600                             | 5,250   | 3,700                               |
| Industry . . . . .                | 99,650                        | —                       | 97,400           | 1,450                              | —   | 800                                 |
| Colleges & Universities . . . . . | 5,350                         | —                       | —                | 5,350                              | —   | —                                   |
| Nonprofit Institutions . . . . .  | 3,050                         | —                       | —                | 1,550                              | —   | 1,500                               |
| <b>1995<sup>E</sup></b>           |                               |                         |                  |                                    |   |                                     |
| <b>All Sources—TOTAL</b> . . .    | <u>\$171,000</u>              | <u>\$16,700</u>         | <u>\$121,400</u> | <u>\$21,600</u>                    | <u>\$5,300</u>  | <u>\$6,000</u>                      |
| Federal Government . . . . .      | 60,700                        | 16,700                  | 22,100           | 13,000                             | 5,300   | 3,600                               |
| Industry . . . . .                | 101,650                       | —                       | 99,300           | 1,500                              | —   | 850                                 |
| Colleges & Universities . . . . . | 5,500                         | —                       | —                | 5,500                              | —   | —                                   |
| Nonprofit Institutions . . . . .  | 3,150                         | —                       | —                | 1,600                              | —   | 1,550                               |

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

a Source/performer detail not available by industry.

E Estimate.

p Preliminary.

r Revised.

**FEDERAL OUTLAYS FOR CONDUCT OF  
RESEARCH AND DEVELOPMENT**

Fiscal Years 1982–1996  
(Millions of Dollars)

| Year                                | TOTAL               | DoD      | NASA               | Energy <sup>a</sup> | Other <sup>b</sup>  |
|-------------------------------------|---------------------|----------|--------------------|---------------------|---------------------|
| <b>CURRENT DOLLARS</b>              |                     |          |                    |                     |                     |
| 1982                                | \$34,660            | \$18,363 | \$3,220            | \$5,178             | \$ 7,899            |
| 1983                                | 35,900              | 20,566   | 2,538              | 4,924               | 7,872               |
| 1984                                | 40,986              | 23,850   | 3,538 <sup>r</sup> | 5,182               | 8,416 <sup>r</sup>  |
| 1985                                | 47,216              | 28,165   | 2,969 <sup>r</sup> | 6,954               | 9,128 <sup>r</sup>  |
| 1986                                | 52,141              | 33,396   | 3,431 <sup>r</sup> | 5,392               | 9,922 <sup>r</sup>  |
| 1987                                | 53,256              | 34,732   | 3,250              | 5,262               | 10,012              |
| 1988                                | 56,100              | 35,605   | 3,832              | 5,332               | 11,331              |
| 1989                                | 60,760              | 37,819   | 4,975              | 5,681               | 12,285              |
| 1990                                | 63,810              | 38,247   | 6,325              | 5,957               | 13,281              |
| 1991                                | 62,183 <sup>r</sup> | 35,330   | 7,072              | 5,892 <sup>r</sup>  | 13,889              |
| 1992                                | 64,728              | 35,504   | 7,617              | 6,043               | 15,564 <sup>r</sup> |
| 1993                                | 68,378              | 37,666   | 8,088              | 6,036               | 16,588              |
| 1994                                | 68,453              | 35,474   | 7,878              | 5,904               | 19,197              |
| 1995 <sup>E</sup>                   | 68,864              | 35,716   | 8,786              | 6,081               | 18,281              |
| 1996 <sup>E</sup>                   | 69,405              | 35,206   | 8,724              | 6,250               | 19,225              |
| <b>CONSTANT DOLLARS<sup>c</sup></b> |                     |          |                    |                     |                     |
| 1982                                | \$41,484            | \$21,978 | \$3,854            | \$6,197             | \$ 9,454            |
| 1983                                | 41,255              | 23,634   | 2,917              | 5,658               | 9,046               |
| 1984                                | 45,114              | 26,252   | 3,894 <sup>r</sup> | 5,704               | 9,264 <sup>r</sup>  |
| 1985                                | 50,059              | 29,861   | 3,148 <sup>r</sup> | 7,373               | 9,678 <sup>r</sup>  |
| 1986                                | 53,687              | 34,386   | 3,533 <sup>r</sup> | 5,552               | 10,216 <sup>r</sup> |
| 1987                                | 53,256              | 34,732   | 3,250              | 5,262               | 10,012              |
| 1988                                | 54,135              | 34,358   | 3,698              | 5,145               | 10,934              |
| 1989                                | 56,140              | 34,943   | 4,597              | 5,249               | 11,351              |
| 1990                                | 56,973              | 34,149   | 5,647              | 5,319               | 11,858              |
| 1991 <sup>r</sup>                   | 53,284              | 30,274   | 6,060              | 5,049               | 11,901              |
| 1992 <sup>r</sup>                   | 53,895              | 29,562   | 6,342              | 5,032               | 12,959              |
| 1993 <sup>r</sup>                   | 55,592              | 30,623   | 6,576              | 4,907               | 13,486              |
| 1994                                | 54,588              | 28,289   | 6,282              | 4,708               | 15,309              |
| 1995 <sup>E</sup>                   | 53,466              | 27,730   | 6,821              | 4,721               | 14,193              |
| 1996 <sup>E</sup>                   | 52,342              | 26,551   | 6,579              | 4,713               | 14,498              |

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

NOTE: Detail may not add to totals because of rounding.

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

b Includes but not limited to NSF, NIH, DoT, & Agriculture.

c Based on Fiscal Year GDP implicit price deflator, (1987=100).

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

r Revised.

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

By Funding Source  
Calendar Years 1979–1993  
(Millions of Dollars)

| Year                                | All Industries <sup>a</sup> |               |                            | Aerospace Industry <sup>b</sup> |               |                            |
|-------------------------------------|-----------------------------|---------------|----------------------------|---------------------------------|---------------|----------------------------|
|                                     | Total                       | Federal Funds | Company Funds <sup>c</sup> | Total                           | Federal Funds | Company Funds <sup>c</sup> |
| <b>CURRENT DOLLARS</b>              |                             |               |                            |                                 |               |                            |
| 1979                                | \$ 38,226                   | \$12,518      | \$25,708                   | \$ 8,041                        | \$ 5,840      | \$2,201                    |
| 1980                                | 44,505                      | 14,029        | 30,476                     | 9,198                           | 6,628         | 2,570                      |
| 1981                                | 51,810                      | 16,382        | 35,428                     | 11,968                          | 8,528         | 3,440                      |
| 1982                                | 58,650                      | 18,545        | 40,105                     | 14,451                          | 10,265        | 4,186                      |
| 1983                                | 65,268                      | 20,680        | 44,588                     | 15,406                          | 11,396        | 4,010                      |
| 1984                                | 74,800                      | 23,396        | 51,404                     | 18,858                          | 14,094        | 4,764                      |
| 1985                                | 84,239                      | 27,196        | 57,043                     | 22,231                          | 16,582        | 5,649                      |
| 1986                                | 87,823                      | 27,891        | 59,932                     | 21,050                          | 14,984        | 6,066                      |
| 1987                                | 92,155                      | 30,752        | 61,403                     | 24,458                          | 18,519        | 5,939                      |
| 1988 <sup>r</sup>                   | 97,015                      | 30,343        | 66,672                     | 24,168                          | 18,402        | 5,766                      |
| 1989 <sup>r</sup>                   | 102,055                     | 28,554        | 73,501                     | 22,331                          | 16,828        | 5,503                      |
| 1990 <sup>r</sup>                   | 109,727                     | 28,125        | 81,602                     | 20,635                          | 15,248        | 5,387                      |
| 1991                                | 116,952                     | 26,372        | 90,580                     | 16,629                          | 11,096        | 5,533                      |
| 1992 <sup>r</sup>                   | 119,110                     | 24,722        | 94,388                     | 17,158                          | 10,287        | 6,871                      |
| 1993                                | 118,334                     | 22,813        | 95,521                     | 15,615                          | 9,369         | 6,246                      |
| <b>CONSTANT DOLLARS<sup>d</sup></b> |                             |               |                            |                                 |               |                            |
| 1979                                | \$ 58,316                   | \$19,097      | \$39,219                   | \$12,267                        | \$ 8,909      | \$3,358                    |
| 1980                                | 62,062                      | 19,564        | 42,499                     | 12,827                          | 9,243         | 3,584                      |
| 1981                                | 65,699                      | 20,774        | 44,925                     | 15,176                          | 10,814        | 4,362                      |
| 1982                                | 70,021                      | 22,141        | 47,881                     | 17,253                          | 12,255        | 4,998                      |
| 1983                                | 74,883                      | 23,726        | 51,156                     | 17,676                          | 13,075        | 4,601                      |
| 1984                                | 82,153                      | 25,696        | 56,457                     | 20,712                          | 15,479        | 5,232                      |
| 1985                                | 89,265                      | 28,818        | 60,446                     | 23,557                          | 17,571        | 5,986                      |
| 1986                                | 90,614                      | 28,777        | 61,837                     | 21,719                          | 15,460        | 6,259                      |
| 1987                                | 92,155                      | 30,752        | 61,403                     | 24,458                          | 18,519        | 5,939                      |
| 1988 <sup>r</sup>                   | 93,418                      | 29,218        | 64,200                     | 23,272                          | 17,720        | 5,552                      |
| 1989 <sup>r</sup>                   | 94,060                      | 26,317        | 67,743                     | 20,582                          | 15,510        | 5,072                      |
| 1990 <sup>r</sup>                   | 96,846                      | 24,823        | 72,023                     | 18,213                          | 13,458        | 4,755                      |
| 1991 <sup>r</sup>                   | 99,449                      | 22,425        | 77,024                     | 14,140                          | 9,435         | 4,705                      |
| 1992 <sup>r</sup>                   | 98,519                      | 20,448        | 78,071                     | 14,192                          | 8,509         | 5,683                      |
| 1993                                | 95,817                      | 18,472        | 77,345                     | 12,644                          | 7,916         | 5,087                      |

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

NOTE: Detail may not add to totals because of rounding.

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

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

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

d Based on GDP implicit price deflator, (1987=100).

r Revised.

**RESEARCH AND DEVELOPMENT FUNDS AS PERCENT OF NET SALES  
ALL MANUFACTURING INDUSTRIES AND THE AEROSPACE INDUSTRY**  
Calendar Years 1978–1993

| Year              | All Manufacturing Industries <sup>a</sup> |               | Aerospace Industry <sup>b</sup> |                  |
|-------------------|---|---------------|---------------------------------|------------------|
|                   | Total Funds                               | Company Funds | Total Funds                     | Company Funds    |
| 1978              | 2.9%                                      | 2.0%          | 13.3%                           | 3.2%             |
| 1979              | 2.6                                       | 1.9           | 12.9                            | 3.5              |
| 1980              | 3.0                                       | 2.1           | 13.7                            | 3.8              |
| 1981              | 3.1                                       | 2.2           | 16.0                            | 4.6              |
| 1982              | 3.8                                       | 2.6           | 17.1                            | 5.1              |
| 1983              | 3.9                                       | 2.6           | 15.2                            | 4.1              |
| 1984              | 3.9                                       | 2.6           | 15.4                            | 4.0              |
| 1985              | 4.4                                       | 3.0           | 14.9                            | 3.9              |
| 1986              | 4.7                                       | 3.2           | 13.4                            | 4.0              |
| 1987              | 4.6                                       | 3.1           | 14.7                            | 3.6              |
| 1988 <sup>r</sup> | 4.5                                       | 3.1           | 16.3                            | 3.9              |
| 1989 <sup>r</sup> | 4.3                                       | 3.1           | 13.5                            | 3.3              |
| 1990 <sup>r</sup> | 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 <sup>r</sup> |
| 1993              | 3.8                                       | 3.1           | 13.2                            | 5.2              |

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

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

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

r Revised.

## FUNDS FOR INDUSTRIAL RESEARCH AND DEVELOPMENT IN THE AEROSPACE INDUSTRY

By Type of Research and Funding Source  
Calendar Years 1964–1993  
(Millions of Dollars)

| Year              | TOTAL<br>AERO-<br>SPACE | Basic Research |                  |                       | Applied Research |                  |                       | Development |                     |                       |
|-------------------|-------------------------|----------------|------------------|-----------------------|------------------|------------------|-----------------------|-------------|---------------------|-----------------------|
|                   |                         | Total          | Federal<br>Funds | Com-<br>pany<br>Funds | Total            | Federal<br>Funds | Com-<br>pany<br>Funds | Total       | Federal<br>Funds    | Com-<br>pany<br>Funds |
| 1964              | \$ 5,078                | \$ 67          | \$ 34            | \$ 28                 | \$ 766           | \$ 607           | \$ 159                | \$ 4,244    | \$ 3,948            | \$ 296                |
| 1965              | 5,148                   | 71             | 41               | 30                    | 735              | 563              | 172                   | 4,342       | 3,921               | 421                   |
| 1966              | 5,526                   | 69             | 36               | 33                    | 773              | 563              | 210                   | 4,685       | 4,162               | 523                   |
| 1967              | 5,669                   | 71             | 33               | 38                    | 726              | 490              | 236                   | 4,871       | 4,071               | 800                   |
| 1968              | 5,765                   | 68             | 26               | 42                    | 677              | 426              | 251                   | 5,021       | 4,145               | 876                   |
| 1969              | 5,882                   | 65             | 24               | 41                    | 597              | 347              | 250                   | 5,220       | 4,216               | 1,004                 |
| 1970              | 5,219                   | 63             | 20               | 43                    | 565              | 352              | 213                   | 4,591       | 3,718               | 873                   |
| 1971              | 4,881                   | 54             | 37               | 17                    | 461              | 279              | 182                   | 4,365       | 3,583               | 782                   |
| 1972              | 4,950                   | 60             | 44               | 16                    | 451              | 267              | 184                   | 4,438       | 3,722               | 716                   |
| 1973              | 5,052                   | 50             | 21               | 29                    | 512              | 308              | 204                   | 4,491       | 3,633               | 858                   |
| 1974              | 5,278                   | 51             | 19               | 32                    | 609              | 360              | 249                   | 4,617       | 3,735               | 882                   |
| 1975              | 5,713                   | 54             | 17               | 37                    | 614              | 381              | 233                   | 5,044       | 4,119               | 925                   |
| 1976              | 6,339                   | 54             | 21               | 33                    | 666              | 365              | 301                   | 5,619       | 4,521               | 1,098                 |
| 1977              | 7,033                   | 56             | 25               | 31                    | 753              | 419              | 334                   | 6,223       | 5,017               | 1,206                 |
| 1979 <sup>a</sup> | 8,041                   | 86             | 44               | 42                    | 880              | 499              | 381                   | 7,076       | 5,314               | 1,762                 |
| 1981 <sup>a</sup> | 11,968                  | 131            | 60               | 71                    | 1,484            | 897              | 587                   | 10,353      | 7,738               | 2,615                 |
| 1983              | 13,853                  | 146            | NA               | NA                    | 3,466            | NA               | NA                    | 10,241      | 7,668               | 2,573                 |
| 1984              | 16,033                  | 247            | NA               | NA                    | 3,067            | NA               | NA                    | 12,718      | 9,870               | 2,848                 |
| 1985              | 17,619                  | 304            | 162              | 142                   | 3,785            | 2,776            | 1,009                 | 13,530      | 10,483              | 3,047                 |
| 1986              | 21,050                  | 311            | 208              | 103                   | 3,198            | 1,571            | 1,627                 | 17,541      | 13,205              | 4,336                 |
| 1987              | 24,488                  | 425            | 335              | 90                    | 2,949            | 1,709            | 1,239                 | 21,115      | 16,475              | 4,640                 |
| 1988              | 25,900                  | 366            | 263              | 104                   | 2,997            | 1,915            | 1,082                 | 22,537      | 17,700              | 4,838                 |
| 1989              | 25,638                  | 668            | 553              | 116                   | 3,081            | 2,113            | 968                   | 21,889      | 16,967              | 4,921                 |
| 1990              | 25,356                  | 658            | 519              | 139                   | 3,340            | 1,931            | 1,409                 | 21,358      | 16,766              | 4,592                 |
| 1991 <sup>r</sup> | 16,983                  | 364            | 302              | 62                    | 2,091            | 1,105            | 986                   | 14,528      | 10,043 <sup>b</sup> | 4,485                 |
| 1992 <sup>r</sup> | 17,158                  | 270            | 235              | 35                    | 1,742            | 976              | 776                   | 15,146      | 9,077               | 6,069                 |
| 1993              | 15,615                  | 288            | 256              | 32                    | 1,421            | 839              | 582                   | 13,906      | 8,274               | 5,633                 |

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

NOTE: Detail may not add to totals because of rounding.

<sup>a</sup> Break-outs by Research Type and Funding Source available only for odd-numbered years between 1977 and 1983.

<sup>b</sup> Computed by AIA as difference between total and company funds. Figure withheld by NSF because of imputation of more than 50 percent.

NA Not available.

<sup>r</sup> Revised.

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

Calendar Years 1979–1994

| Year              | Employment <sup>a</sup>                    |                                       |  | Cost Per R&D Scientist and Engineer <sup>d</sup> |                        |
|-------------------|--|---------------------------------------|--|--|------------------------|
|                   | All Industries <sup>b</sup><br>(Thousands) | Aerospace <sup>c</sup><br>(Thousands) | Aerospace as<br>a Percent of<br>All Industries | All Industries <sup>b</sup>                      | Aerospace <sup>c</sup> |
| 1979              | 423.9                                      | 86.5                                  | 20.4%  | \$ 87,400  | \$ 93,300              |
| 1980              | 450.6                                      | 85.9                                  | 19.1   | 94,900   | 101,600                |
| 1981              | 487.8                                      | 95.2                                  | 19.5   | 103,900  | 128,400                |
| 1982              | 509.8                                      | 91.1                                  | 17.9   | 111,600  | 148,800                |
| 1983              | 540.9                                      | 103.1                                 | 19.1   | 116,000  | 143,600                |
| 1984              | 584.1                                      | 111.5                                 | 19.1   | 124,000  | 156,000                |
| 1985              | 622.5                                      | 130.2                                 | 20.9   | 130,200  | 161,700                |
| 1986              | 671.0                                      | 144.8                                 | 21.6   | 128,500  | 149,800                |
| 1987              | 695.8                                      | 136.3                                 | 19.6   | 128,800 <sup>f</sup>                             | 180,400 <sup>f</sup>   |
| 1988              | 708.6                                      | 136.4                                 | 19.2   | 132,300 <sup>f</sup>                             | 193,300 <sup>f</sup>   |
| 1989 <sup>f</sup> | 722.5                                      | 134.8                                 | 18.7   | 134,500  | 207,300                |
| 1990 <sup>f</sup> | 743.6                                      | 115.3                                 | 15.5   | 141,300  | 213,700                |
| 1991 <sup>f</sup> | 773.4                                      | 100.2                                 | 13.0   | 148,600  | 177,000                |
| 1992 <sup>f</sup> | 779.3                                      | 92.9                                  | 11.9   | 157,912  | 180,552                |
| 1993 <sup>f</sup> | 764.7                                      | 97.9                                  | 12.8   | 154,814  | 183,400                |
| 1994              | 764.3                                      | 72.4                                  | 9.5  | NA   | NA                     |

Source: National Science Foundation.

- a Employment as of January. Scientists and engineers working less than full time have been included in terms of their full time equivalent number.
  - b All manufacturing industries and those non-manufacturing industries known to conduct or finance research and development.
  - c Standard Industrial Classification codes 372 and 376.
  - d The arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years, divided into the total R&D expenditures of each industry during the earlier year.
- NA Not available.  
r Revised.

## FEDERAL AERONAUTICS RESEARCH AND DEVELOPMENT

Fiscal Years 1976–1994

(Millions of Dollars)

| Year                    | TOTAL               | NASA <sup>a</sup> | DoD <sup>b</sup> | DoT <sup>c</sup>   |
|-------------------------|---------------------|-------------------|------------------|--------------------|
| <b>BUDGET AUTHORITY</b> |                     |                   |                  |                    |
| 1976                    | \$ 2,351            | \$ 325            | \$1,941          | \$ 85              |
| Tr.Qtr.                 | 584                 | 83                | 480              | 22                 |
| 1977                    | 2,727               | 378               | 2,256            | 93                 |
| 1978                    | 3,338               | 437               | 2,807            | 94                 |
| 1979                    | 2,850               | 519               | 2,240            | 91                 |
| 1980                    | 2,991               | 560               | 2,336            | 95                 |
| 1981                    | 3,286               | 526               | 2,653            | 106                |
| 1982                    | 3,581               | 516               | 2,984            | 81                 |
| 1983                    | 3,871               | 547               | 3,221            | 103                |
| 1984                    | 4,087               | 600               | 3,224            | 263                |
| 1985                    | 4,355               | 648               | 3,422            | 265                |
| 1986                    | 6,660               | 601               | 4,927            | 1,132              |
| 1987                    | 5,824               | 698               | 4,179            | 946                |
| 1988                    | 6,974               | 723               | 4,989            | 1,262              |
| 1989                    | 10,656              | 872               | 8,240            | 1,544              |
| 1990                    | 10,690              | 932               | 7,867            | 1,891              |
| 1991                    | 9,417               | 968               | 6,149            | 2,300              |
| 1992                    | 11,110 <sup>r</sup> | 1,117             | 7,366            | 2,627 <sup>f</sup> |
| 1993                    | 11,379              | 1,246             | 7,601            | 2,532              |
| 1994 <sup>E</sup>       | 10,618              | 1,546             | 6,763            | 2,309              |
| <b>OUTLAYS</b>          |                     |                   |                  |                    |
| 1982 <sup>d</sup>       | \$ 3,309            | \$ 563            | \$2,657          | \$ 89              |
| 1983                    | 3,554               | 563               | 2,920            | 71                 |
| 1984                    | 3,727               | 586               | 2,995            | 146                |
| 1985                    | 4,010               | 643               | 3,101            | 266                |
| 1986                    | 6,071               | 648               | 4,373            | 1,050              |
| 1987                    | 5,866               | 622               | 4,182            | 1,062              |
| 1988                    | 6,340               | 679               | 4,448            | 1,213              |
| 1989                    | 8,491               | 855               | 6,420            | 1,216              |
| 1990                    | 10,009              | 889               | 7,649            | 1,471              |
| 1991                    | 9,501               | 1,017             | 6,793            | 1,691              |
| 1992                    | 10,011              | 1,122             | 6,790            | 2,099              |
| 1993                    | 10,755              | 1,212             | 7,165            | 2,378              |
| 1994 <sup>E</sup>       | 10,829              | 1,330             | 6,895            | 2,604              |

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

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

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

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

d First year outlays data available.

E Estimate.

Tr.Qtr. See Glossary.

r Revised.

**FEDERAL AERONAUTICS RESEARCH AND DEVELOPMENT  
IN CONSTANT DOLLARS**

Fiscal Years 1976–1994  
(Millions of Constant Dollars<sup>a</sup>)

| Year                    | TOTAL   | NASA <sup>b</sup> | DoD <sup>c</sup> | DoT <sup>d</sup> |
|-------------------------|---------|-------------------|------------------|------------------|
| <b>BUDGET AUTHORITY</b> |         |                   |                  |                  |
| 1976                    | \$4,590 | \$ 635            | \$3,790          | \$ 166           |
| Tr.Qtr.                 | 1,083   | 154               | 891              | 41               |
| 1977                    | 4,924   | 683               | 4,074            | 168              |
| 1978                    | 5,603   | 734               | 4,712            | 158              |
| 1979                    | 4,402   | 802               | 3,460            | 141              |
| 1980                    | 4,238   | 793               | 3,310            | 135              |
| 1981                    | 4,226   | 676               | 3,412            | 136              |
| 1982                    | 4,286   | 618               | 3,572            | 97               |
| 1983                    | 4,448   | 629               | 3,701            | 118              |
| 1984                    | 4,499   | 660               | 3,549            | 289              |
| 1985                    | 4,617   | 687               | 3,628            | 281              |
| 1986                    | 6,857   | 619               | 5,073            | 1,166            |
| 1987                    | 5,824   | 698               | 4,179            | 946              |
| 1988                    | 6,730   | 698               | 4,814            | 1,218            |
| 1989                    | 9,846   | 806               | 7,613            | 1,427            |
| 1990                    | 9,545   | 832               | 7,024            | 1,688            |
| 1991 <sup>r</sup>       | 8,069   | 829               | 5,269            | 1,971            |
| 1992 <sup>r</sup>       | 9,251   | 930               | 6,133            | 2,187            |
| 1993                    | 9,251   | 1,013             | 6,180            | 2,059            |
| 1994 <sup>E</sup>       | 8,467   | 1,233             | 5,393            | 1,841            |
| <b>OUTLAYS</b>          |         |                   |                  |                  |
| 1982 <sup>f</sup>       | \$3,961 | \$ 674            | \$3,180          | \$ 107           |
| 1983                    | 4,084   | 647               | 3,356            | 82               |
| 1984                    | 4,102   | 645               | 3,297            | 161              |
| 1985                    | 4,251   | 682               | 3,288            | 282              |
| 1986                    | 6,251   | 667               | 4,503            | 1,081            |
| 1987                    | 5,866   | 622               | 4,182            | 1,062            |
| 1988                    | 6,118   | 655               | 4,292            | 1,171            |
| 1989                    | 7,845   | 790               | 5,932            | 1,124            |
| 1990                    | 8,937   | 794               | 6,829            | 1,313            |
| 1991 <sup>r</sup>       | 8,141   | 871               | 5,821            | 1,449            |
| 1992 <sup>r</sup>       | 8,336   | 934               | 5,654            | 1,748            |
| 1993                    | 8,744   | 985               | 5,825            | 1,933            |
| 1994                    | 8,636   | 1,061             | 5,498            | 2,077            |

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

a Based on Fiscal Year GDP implicit price deflator, 1987=100.

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

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

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

e Estimate.

f First year outlays data available.

r Revised.

Tr.Qtr. See Glossary.



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

Fiscal Years 1994–1996  
(Millions of Dollars)

|   | 1994     | 1995 <sup>E</sup> | 1996 <sup>E</sup> |
|---|----------|-------------------|-------------------|
| <b>TOTAL—APPROPRIATIONS FOR RDT&amp;E</b> . . . . . | \$34,706 | \$35,515          | \$34,332          |
| <b>BY APPROPRIATION</b>                             |          |                   |                   |
| Army . . . . .                                      | \$ 5,413 | \$ 5,481          | \$ 4,444          |
| Navy . . . . .                                      | 8,191    | 8,695             | 8,205             |
| Air Force . . . . .                                 | 12,118   | 12,057            | 12,598            |
| Defense Agencies . . . . .                          | 8,680    | 9,025             | 8,803             |
| Director of Test & Evaluation, Defense . . . . .    | 232      | 233               | 259               |
| Director of Operational Test & Evaluation . . . . . | 11       | 23                | 23                |
| <b>RECAP OF BUDGET ACTIVITIES</b>                   |          |                   |                   |
| Research . . . . .                                  | \$ 1,167 | \$ 1,227          | \$ 1,214          |
| Exploratory Development . . . . .                   | 2,691    | 3,070             | 2,816             |
| Advanced Development . . . . .                      | 6,208    | 4,339             | 3,796             |
| Demonstration and Validation . . . . .              | 2,697    | 4,325             | 4,229             |
| Engineering & Manufacturing Development . . . . .   | 7,334    | 8,930             | 8,759             |
| RDT&E Management Support . . . . .                  | 3,369    | 3,436             | 3,305             |
| Operational Systems Development . . . . .           | 11,242   | 10,188            | 10,213            |
| <b>RECAP OF FYDP PROGRAMS</b>                       |          |                   |                   |
| Strategic Forces . . . . .                          | \$ 290   | \$ 146            | \$ 132            |
| General Purpose Forces . . . . .                    | 3,619    | 3,674             | 3,266             |
| Intelligence and Communications . . . . .           | 6,731    | 5,954             | 6,364             |
| Airlift/Sealift . . . . .                           | 22       | 23                | 18                |
| Research and Development (FYDP Program 6) . . . . . | 23,424   | 25,479            | 24,378            |
| Central Supply and Maintenance . . . . .            | 329      | 31                | 23                |
| Training Medical and Other . . . . .                | 2        | 1                 | 1                 |
| Administration and Associated Activities . . . . .  | 6        | 6                 | 6                 |
| Support of Other Nations . . . . .                  | 2        | 2                 | 4                 |
| Special Operations Forces . . . . .                 | 281      | 201               | 140               |

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

**DEPARTMENT OF DEFENSE**  
**OUTLAYS FOR RESEARCH, DEVELOPMENT, TEST, AND EVALUATION**  
**Fiscal Years 1972–1996**  
**(Millions of Dollars)**

| Year              | TOTAL, All<br>RDT&E<br>Functions | Air Force | Navy    | Army    | Other  |
|-------------------|----------------------------------|-----------|---------|---------|--------|
| 1972              | \$ 7,881                         | \$ 3,205  | \$2,427 | \$1,779 | \$ 470 |
| 1973              | 8,157                            | 3,362     | 2,404   | 1,912   | 479    |
| 1974              | 8,582                            | 3,240     | 2,623   | 2,190   | 529    |
| 1975              | 8,866                            | 3,308     | 3,021   | 1,964   | 573    |
| 1976              | 8,923                            | 3,338     | 3,215   | 1,842   | 528    |
| Tr. Qtr.          | 2,203                            | 830       | 778     | 437     | 161    |
| 1977              | 9,795                            | 3,618     | 3,481   | 2,069   | 627    |
| 1978              | 10,508                           | 3,626     | 3,825   | 2,342   | 715    |
| 1979              | 11,152                           | 4,080     | 3,826   | 2,409   | 837    |
| 1980              | 13,127                           | 5,017     | 4,382   | 2,707   | 1,021  |
| 1981              | 15,278                           | 6,341     | 4,783   | 2,958   | 1,196  |
| 1982              | 17,729                           | 7,794     | 5,240   | 3,230   | 1,465  |
| 1983              | 20,554                           | 9,182     | 5,854   | 3,658   | 1,861  |
| 1984              | 23,117                           | 10,353    | 6,662   | 3,812   | 2,289  |
| 1985              | 27,103                           | 11,573    | 8,054   | 3,950   | 3,527  |
| 1986              | 32,283                           | 13,417    | 9,667   | 3,984   | 5,215  |
| 1987              | 33,596                           | 13,347    | 9,176   | 4,721   | 6,352  |
| 1988              | 34,792                           | 14,302    | 8,828   | 4,624   | 7,038  |
| 1989              | 37,002                           | 14,912    | 9,291   | 4,966   | 7,833  |
| 1990              | 37,458                           | 14,443    | 9,160   | 5,513   | 8,342  |
| 1991              | 34,589                           | 13,050    | 7,586   | 5,559   | 8,371  |
| 1992              | 34,632                           | 11,998    | 7,826   | 5,978   | 8,830  |
| 1993              | 36,967                           | 12,338    | 8,944   | 6,218   | 9,467  |
| 1994              | 34,786                           | 12,513    | 7,990   | 5,746   | 8,537  |
| 1995 <sup>E</sup> | 35,095                           | 12,166    | 8,654   | 5,191   | 9,084  |
| 1996 <sup>E</sup> | 34,543                           | 12,032    | 8,458   | 4,880   | 9,173  |

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

<sup>E</sup> Estimate. Latest year reflects Administration's budget proposal.

Tr. Qtr. See Glossary.

**DEPARTMENT OF DEFENSE  
PRIME CONTRACT AWARDS  
FOR RESEARCH, DEVELOPMENT, TEST, AND EVALUATION**  
Fiscal Years 1990–1994  
(Millions of Dollars)

| Program Categories                        | 1990            | 1991            | 1992            | 1993            | 1994            |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>TOTAL—RDT&amp;E</b> .....              | <u>\$22,319</u> | <u>\$20,898</u> | <u>\$21,730</u> | <u>\$22,292</u> | <u>\$21,824</u> |
| Research .....                            | 994             | 1,063           | 1,195           | 1,377           | 1,052           |
| Exploratory Development .....             | 1,813           | 2,288           | 2,159           | 2,203           | 2,181           |
| Other Development .....                   | 18,697          | 16,424          | 16,975          | 17,251          | 17,468          |
| Management & Support .....                | 815             | 1,124           | 1,401           | 1,461           | 1,123           |
| <b>Aircraft—TOTAL</b> .....               | <u>\$ 4,364</u> | <u>\$ 3,143</u> | <u>\$ 4,022</u> | <u>\$ 5,114</u> | <u>\$ 5,809</u> |
| Research .....                            | (191)           | 13              | 18              | 13              | 10              |
| Exploratory Development .....             | 82              | 83              | 74              | 86              | 81              |
| Other Development .....                   | 4,431           | 3,002           | 3,873           | 4,942           | 5,615           |
| Management & Support .....                | 42              | 45              | 58              | 73              | 102             |
| <b>Missile and Space Systems—TOTAL</b> .. | <u>6,865</u>    | <u>6,649</u>    | <u>5,730</u>    | <u>5,871</u>    | <u>5,727</u>    |
| Research .....                            | 175             | 95              | 98              | 339             | 114             |
| Exploratory Development .....             | 308             | 710             | 489             | 456             | 395             |
| Other Development .....                   | 6,291           | 5,759           | 5,084           | 5,011           | 5,160           |
| Management & Support .....                | 91              | 86              | 59              | 65              | 58              |
| <b>Electronics &amp; Communications</b>   |                 |                 |                 |                 |                 |
| <b>Equipment—TOTAL</b> .....              | <u>3,925</u>    | <u>3,814</u>    | <u>4,265</u>    | <u>3,914</u>    | <u>3,567</u>    |
| Research .....                            | 188             | 127             | 147             | 158             | 108             |
| Exploratory Development .....             | 327             | 299             | 369             | 337             | 340             |
| Other Development .....                   | 3,337           | 3,323           | 3,723           | 3,374           | 3,069           |
| Management & Support .....                | 73              | 64              | 27              | 46              | 50              |
| <b>All Other—TOTAL<sup>a</sup></b> .....  | <u>7,165</u>    | <u>7,292</u>    | <u>7,713</u>    | <u>7,392</u>    | <u>6,721</u>    |
| Research .....                            | 822             | 827             | 933             | 867             | 820             |
| Exploratory Development .....             | 1,097           | 1,196           | 1,228           | 1,324           | 1,365           |
| Other Development .....                   | 4,637           | 4,341           | 4,295           | 3,924           | 3,624           |
| Management & Support .....                | 609             | 928             | 1,258           | 1,277           | 912             |

Source: Department of Defense, "Prime Contract Awards by Service Category and Federal Supply Classification" (Annually).

NOTE: Detail may not add to totals because of rounding.

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

(-) Reflects net cancellations.

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

**By Region and Type of Contractor  
Fiscal Year 1994**

| REGION                           | TOTAL    | Type of Contractor       |  |                |
|----------------------------------|----------|--------------------------|--|----------------|
|                                  |          | Educational Institutions | Other Non-Profit Institutions <sup>a</sup> | Business Firms |
| <b>TOTAL—Millions of Dollars</b> | \$21,303 | \$362                    | \$1,839                                    | \$19,102       |
| New England .....                | \$ 2,258 | \$ 36                    | \$ 677                                     | \$ 1,545       |
| Middle Atlantic .....            | 1,934    | 74                       | 166  | 1,694          |
| East North Central .....         | 760      | 49                       | 50   | 660            |
| West North Central .....         | 1,591    | 3                        | 9  | 1,579          |
| South Atlantic .....             | 5,725    | 68                       | 808  | 4,849          |
| East South Central .....         | 753      | 11                       | 3  | 738            |
| West South Central .....         | 1,745    | 24                       | 46   | 1,676          |
| Mountain .....                   | 2,176    | 50                       | 2  | 2,125          |
| Pacific <sup>b</sup> .....       | 4,361    | 47                       | 78   | 4,235          |
| <b>PERCENT OF TOTAL</b> .....    | 100.0%   | 100.0%                   | 100.0%                                     | 100.0%         |
| New England .....                | 10.6%    | 9.9%                     | 36.8%                                      | 8.1%           |
| Middle Atlantic .....            | 9.1      | 20.4                     | 9.0  | 8.9            |
| East North Central .....         | 3.6      | 13.6                     | 2.7  | 3.5            |
| West North Central .....         | 7.5      | 0.9                      | 0.5  | 8.3            |
| South Atlantic .....             | 26.9     | 18.9                     | 43.9                                       | 25.4           |
| East South Central .....         | 3.5      | 3.2                      | 0.2  | 3.9            |
| West South Central .....         | 8.2      | 6.6                      | 2.5  | 8.8            |
| Mountain .....                   | 10.2     | 13.8                     | 0.1  | 11.1           |
| Pacific <sup>b</sup> .....       | 20.5     | 12.9                     | 4.3  | 22.2           |

Source: Department of Defense, "Prime Contract Awards by Region and State" (Annually).

NOTE: Detail may not add to totals because of rounding.

a Includes contracts with other government agencies.

b Includes Alaska and Hawaii.

**MISSILE PROGRAMS  
RESEARCH, DEVELOPMENT, TEST, AND EVALUATION**

By Agency and Model  
Fiscal Years 1994, 1995, and 1996  
(Millions of Dollars<sup>a</sup>)

| Agency and Model          | 1994      | 1995 <sup>E</sup> | 1996 <sup>E</sup> |
|---------------------------|-----------|-------------------|-------------------|
| <b>AIR FORCE</b>          |           |                   |                   |
| AMRAAM <sup>b</sup> ..... | \$ 65.8   | \$ 85.5           | \$ 46.8           |
| *JDAM .....               | 73.7      | 92.8              | 130.0             |
| JSOW <sup>b</sup> .....   | 106.5     | 168.8             | 125.8             |
| *WCMD .....               | NA        | 23.5              | 53.3              |
| <b>NAVY</b>               |           |                   |                   |
| Harpoon .....             | \$ NA     | \$ 62.9           | \$ 40.5           |
| RAM .....                 | NA        | 18.1              | 26.1              |
| Standard .....            | 62.3      | 16.8              | 8.6               |
| Tomahawk .....            | 43.6      | 84.0              | 141.4             |
| Trident II .....          | NA        | 22.2              | 19.7              |
| <b>ARMY</b>               |           |                   |                   |
| AAWS-M .....              | \$ 47.2   | \$ 34.3           | \$ —              |
| ATACMS .....              | NA        | 37.3              | —                 |
| *BAT .....                | 121.9     | 117.5             | 193.3             |
| Longbow Hellfire .....    | NA        | 34.5              | —                 |
| MLRS .....                | 41.7      | 57.8              | 68.8              |
| <b>BMD ORGANIZATION</b>   |           |                   |                   |
| BMD .....                 | \$2,605.1 | \$2,467.6         | \$2,442.2         |

Source: Department of Defense Budget, "Program Acquisition Costs by Weapon System" (Annually).

NOTE: See Missile Programs Chapter for missile program procurement authorization data.

a Total Obligational Authority.

b Navy and Air Force funding.

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

NA Not available.

\* Programs in R&D only.

**Missile Program Acronyms:**

|   |  |
|---|--|
| AAWS-M —Advanced Anti-Tank Weapon System-Medium | AMRAAM —Advanced Medium Range Air-to-Air Missile |
| ATACMS —Army TACTical Missile System            | BAT —Brilliant Anti-Tank submunition             |
| BMD —Ballistic Missile Defense                  | JDAM —Joint Direct Attack Munition               |
| JSOW —Joint Standoff Weapon                     | MLRS —Multiple Launch Rocket System              |
| RAM —Rolling Airframe Missile                   | WCMD —Wind Corrected Munitions Dispenser         |

**MILITARY AIRCRAFT PROGRAMS**  
**RESEARCH, DEVELOPMENT, TEST, AND EVALUATION**

By Agency and Model  
 Fiscal Years 1994, 1995, and 1996  
 (Millions of Dollars<sup>a</sup>)

| Agency and Model           | 1994              | 1995 <sup>E</sup> | 1996 <sup>E</sup> |
|----------------------------|-------------------|-------------------|-------------------|
| <b>AIR FORCE</b>           |                   |                   |                   |
| B-2 Spirit .....           | \$ 776.3          | \$ 384.1          | \$ 623.6          |
| C-17 Globemaster III ..... | 230.4             | 188.1             | 85.8              |
| C-130J .....               | —                 | 4.9               | —                 |
| E-8A JSTARS .....          | 278.8             | 172.3             | 169.7             |
| *F-22 Lightning .....      | 2,058.8           | 2,325.3           | 2,138.7           |
| <b>NAVY</b>                |                   |                   |                   |
| AV-8B Harrier .....        | \$ 12.8           | \$ 10.6           | \$ 11.3           |
| E-2C Hawkeye .....         | 18.1              | 51.3              | 53.0              |
| F/A-18 Hornet .....        | 1,454.1           | 1,312.6           | 919.5             |
| *JAST <sup>b</sup> .....   | 29.7              | 183.6             | 331.2             |
| JPATS <sup>b</sup> .....   | (c)               | 40.4              | 49.6              |
| T-45 Goshawk .....         | 31.8 <sup>c</sup> | 0.3               | 0.5               |
| V-22 Osprey .....          | 9.8               | 452.7             | 762.5             |
| <b>ARMY</b>                |                   |                   |                   |
| Longbow Apache .....       | \$ 271.1          | \$ 169.0          | \$ 23.6           |
| *RAH-66 Comanche .....     | 365.2             | 488.6             | 199.1             |

Source: Department of Defense Budget, "Program Acquisition Costs by Weapon System" (Annually).

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

a Total Obligational Authority.

b Air Force and Navy funding.

c USN funding for training system aircraft. See T-45 and JPATS.

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

\* Programs in R&D only.

# Foreign Trade

---

In 1994, aerospace exports declined more than five percent below the previous year's level and the aerospace trade balance similarly declined. However, the U.S. aerospace industry recorded what is considered an excellent performance in international trade at a time when the global aerospace market was generally depressed.

Aerospace exports totaled \$37.4 billion, down from \$39.4 billion in 1993. At \$25 billion, the aerospace trade balance was down 8.2 percent from 1993's \$27.2 billion. Aerospace imports, at \$12.4 billion, increased just slightly from the previous year.

Aerospace exports amounted to 7.3 percent of all U.S. merchandise exports in 1994; the figure compares with 8.5 percent in 1993 and 10 percent in 1992. As is usually the case, civil exports accounted for most of the export volume—more than 80 percent. The 1994 civil export total of \$30 billion compares with \$31.8 billion in 1993.

In terms of dollar value, 53 percent of the civil export volume was in sales of airline transports. Military exports, at \$7.3 billion, were down from \$7.6 billion in the previous year.

A breakdown of civil exports shows sales of complete aircraft at \$17.8 billion (down from \$19.8 bil-

lion); aircraft and engine parts, \$9.6 billion (up from \$9.2 billion); and aircraft engines, \$2.4 billion (up from \$2.3 billion).

At \$15.9 billion, export sales of airline transport aircraft were down sharply from the previous year's \$18.1 billion and constituted the principal reason for the overall decline in export volume. However, transport sales still accounted for 90 percent of all complete aircraft sales.

Complete aircraft exports also included shipments of general aviation aircraft valued at \$598 million (up from \$551 million); \$1.1 billion in used aircraft (up from \$1 billion); \$82 million in civil helicopters (down from \$120 million); and \$309 million in a category listed as "Other, including spacecraft" (up from \$293 million).

Military exports in 1994 totaled \$7.3 billion (down from \$7.6 billion) and included \$1.1 billion in complete aircraft (down from \$1.5 billion); \$4.7 billion in aircraft and engine parts (up from \$4.4 billion); \$1 billion in guided missiles, rockets, and parts (down from \$1.2 billion); and \$251 million in aircraft engines (up from \$190 million).

Civil imports in 1994 totaled \$8.8 billion (up from \$8.6 billion) and included complete aircraft valued at \$3.8 billion (up from \$3.7 billion); aircraft and engine parts at

---

\$3.6 billion (same as prior year); and aircraft engines worth \$1.4 billion (up from \$1.3 billion).

Among \$3.6 billion worth of military imports (as in the prior year) were aircraft and engine parts valued at \$2.2 billion (same), aircraft engines worth \$1.4 billion (up from \$1.3 billion), and complete aircraft valued at \$22 million (up from \$13 million).

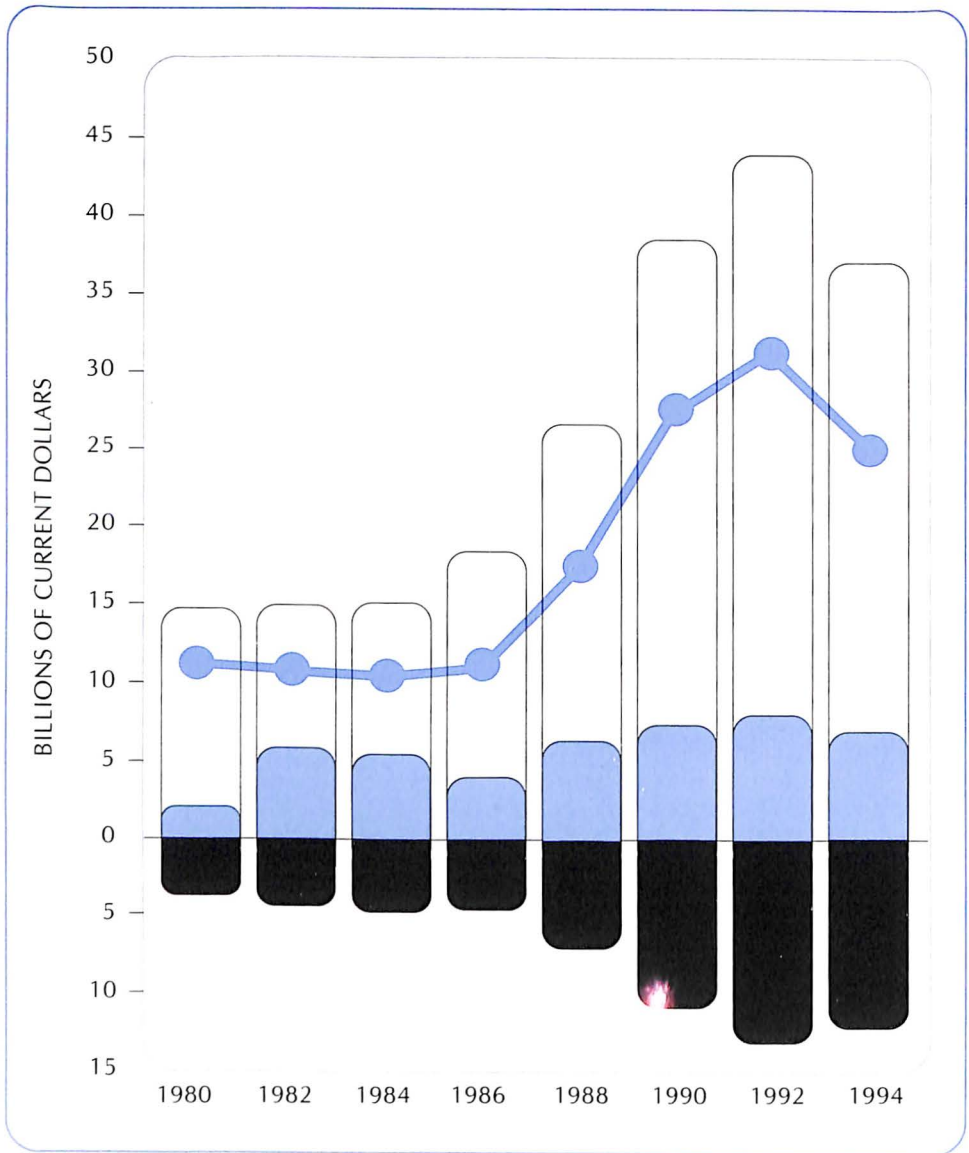
The principal customers for U.S. aerospace exports in 1994 were Japan (\$4.1 billion); the United Kingdom

(\$3.6 billion); France (\$2.9 billion); China (\$2 billion); Singapore (\$1.8 billion); Canada (\$1.8 billion); Taiwan (\$1.8 billion); South Korea (\$1.8 billion); The Netherlands (\$1.7 billion); and Germany (\$1.6 billion).





# Aerospace Exports, Imports, and Trade Balance



CIVIL EXPORTS
  MILITARY EXPORTS
  IMPORTS
  TRADE BALANCE

SOURCE: AEROSPACE INDUSTRIES ASSOCIATION

**U.S. TOTAL AND AEROSPACE FOREIGN TRADE<sup>a</sup>**  
**Calendar Years 1964–1994**  
**(Millions of Dollars)**

| Year | Total U.S. Merchandise Trade |           |                      | Aerospace     |          |         |
|------|------------------------------|-----------|----------------------|---------------|----------|---------|
|      | Trade Balance                | Exports   | Imports              | Trade Balance | Exports  | Imports |
| 1964 | \$ 7,006                     | \$ 25,690 | \$ 18,684            | \$ 1,518      | \$ 1,608 | \$ 90   |
| 1965 | 5,334                        | 26,699    | 21,366               | 1,459         | 1,618    | 159     |
| 1966 | 3,837                        | 29,379    | 25,542               | 1,370         | 1,673    | 303     |
| 1967 | 4,122                        | 30,934    | 26,812               | 1,961         | 2,248    | 287     |
| 1968 | 837                          | 34,063    | 33,226               | 2,661         | 2,994    | 333     |
| 1969 | 1,289                        | 37,332    | 36,043               | 2,831         | 3,138    | 307     |
| 1970 | 3,225                        | 43,176    | 39,952               | 3,097         | 3,405    | 308     |
| 1971 | (1,476) <sup>b</sup>         | 44,087    | 45,563               | 3,830         | 4,203    | 373     |
| 1972 | (5,729)                      | 49,854    | 55,583               | 3,230         | 3,795    | 565     |
| 1973 | 2,390                        | 71,865    | 69,476               | 4,360         | 5,142    | 782     |
| 1974 | (3,884)                      | 99,437    | 103,321              | 6,350         | 7,095    | 745     |
| 1975 | 9,551                        | 108,856   | 99,305               | 7,045         | 7,792    | 747     |
| 1976 | (7,820)                      | 116,794   | 124,614              | 7,267         | 7,843    | 576     |
| 1977 | (28,353)                     | 123,182   | 151,534              | 6,850         | 7,581    | 731     |
| 1978 | (30,205)                     | 145,847   | 176,052              | 9,058         | 10,001   | 943     |
| 1979 | (23,922)                     | 186,363   | 210,285              | 10,123        | 11,747   | 1,624   |
| 1980 | (19,696)                     | 225,566   | 245,262              | 11,952        | 15,506   | 3,554   |
| 1981 | (22,267)                     | 238,715   | 260,982              | 13,134        | 17,634   | 4,500   |
| 1982 | (27,510)                     | 216,442   | 243,952              | 11,035        | 15,603   | 4,568   |
| 1983 | (52,409)                     | 205,639   | 258,048              | 12,619        | 16,065   | 3,446   |
| 1984 | (106,703)                    | 223,976   | 330,678              | 10,082        | 15,008   | 4,926   |
| 1985 | (117,712)                    | 218,815   | 336,526              | 12,593        | 18,725   | 6,132   |
| 1986 | (138,279)                    | 227,159   | 365,438              | 11,826        | 19,728   | 7,902   |
| 1987 | (152,119)                    | 254,122   | 406,241              | 14,575        | 22,480   | 7,905   |
| 1988 | (118,526)                    | 322,426   | 440,952              | 17,860        | 26,947   | 9,087   |
| 1989 | (109,399)                    | 363,812   | 473,211              | 22,083        | 32,111   | 10,028  |
| 1990 | (101,718)                    | 393,592   | 495,311              | 27,282        | 39,083   | 11,801  |
| 1991 | (66,723) <sup>f</sup>        | 421,730   | 488,453 <sup>r</sup> | 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 | (151,308)                    | 512,521   | 663,829              | 25,010        | 37,373   | 12,363  |

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

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

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

b First U.S. trade deficit since 1888.

r Revised.

**TOTAL U.S. EXPORTS AND EXPORTS OF AEROSPACE PRODUCTS**

Calendar Years 1964–1994

(Millions of Dollars)

| Year | TOTAL<br>Exports<br>of U.S.<br>Merchandise <sup>a</sup> | Exports of Aerospace Products |  |        |                 |          |
|------|---|-------------------------------|--|--------|-----------------|----------|
|      |   | TOTAL                         | Percent<br>of Total<br>U.S.<br>Exports | Civil  |                 | Military |
|      |   |                               |  | Total  | Trans-<br>ports |          |
| 1964 | \$ 25,690   | \$ 1,608                      | 6.3%                                   | \$ 764 | \$ 211          | \$ 844   |
| 1965 | 26,699  | 1,618                         | 6.1                                    | 854    | 353             | 764      |
| 1966 | 29,379  | 1,673                         | 5.7                                    | 1,035  | 421             | 638      |
| 1967 | 30,934  | 2,248                         | 7.3                                    | 1,380  | 611             | 868      |
| 1968 | 34,063  | 2,994                         | 8.8                                    | 2,289  | 1,200           | 705      |
| 1969 | 37,332  | 3,138                         | 8.4                                    | 2,027  | 947             | 1,111    |
| 1970 | 43,176  | 3,405                         | 7.9                                    | 2,516  | 1,283           | 889      |
| 1971 | 44,087  | 4,203                         | 9.5                                    | 3,080  | 1,567           | 1,123    |
| 1972 | 49,854  | 3,795                         | 7.6                                    | 2,954  | 1,119           | 841      |
| 1973 | 71,865  | 5,142                         | 7.2                                    | 3,788  | 1,664           | 1,354    |
| 1974 | 99,437  | 7,095                         | 7.1                                    | 5,273  | 2,655           | 1,822    |
| 1975 | 108,856   | 7,792                         | 7.2                                    | 5,324  | 2,397           | 2,468    |
| 1976 | 116,794   | 7,843                         | 6.7                                    | 5,677  | 2,468           | 2,166    |
| 1977 | 123,182   | 7,581                         | 6.2                                    | 5,049  | 1,936           | 2,532    |
| 1978 | 145,847   | 10,001                        | 6.9                                    | 6,018  | 2,558           | 3,983    |
| 1979 | 186,363   | 11,747                        | 6.3                                    | 9,772  | 4,998           | 1,975    |
| 1980 | 225,566   | 15,506                        | 6.9                                    | 13,248 | 6,727           | 2,258    |
| 1981 | 238,715   | 17,634                        | 7.4                                    | 13,312 | 7,180           | 4,322    |
| 1982 | 216,442   | 15,603                        | 7.2                                    | 9,608  | 3,834           | 5,995    |
| 1983 | 205,639   | 16,065                        | 7.8                                    | 10,595 | 4,683           | 5,470    |
| 1984 | 223,976   | 15,008                        | 6.7                                    | 9,659  | 3,195           | 5,350    |
| 1985 | 218,815   | 18,725                        | 8.6                                    | 12,942 | 5,518           | 5,783    |
| 1986 | 227,159   | 19,728                        | 8.7                                    | 14,851 | 6,276           | 4,875    |
| 1987 | 254,122   | 22,480                        | 8.8                                    | 15,768 | 6,377           | 6,714    |
| 1988 | 322,426   | 26,947                        | 8.4                                    | 20,298 | 8,766           | 6,651    |
| 1989 | 363,812   | 32,111                        | 8.8                                    | 25,619 | 12,313          | 6,492    |
| 1990 | 393,592   | 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                                   | 36,904 | 22,379          | 8,114    |
| 1993 | 465,091 <sup>r</sup>                                    | 39,418                        | 8.5                                    | 31,821 | 18,146          | 7,598    |
| 1994 | 512,521   | 37,373                        | 7.3                                    | 30,049 | 15,931          | 7,324    |

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

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

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

r Revised.

## U.S. EXPORTS OF AEROSPACE PRODUCTS<sup>a</sup> BY MAJOR COUNTRIES OF DESTINATION

Calendar Years 1990–1994  
(Millions of Dollars)

| Major Countries of Destination | 1990             | 1991               | 1992               | 1993             | 1994   |
|--------------------------------|------------------|--------------------|--------------------|------------------|--------|
| Australia .....                | \$1,760          | \$1,596            | \$1,746            | \$ 543           | \$ 812 |
| Belgium/Luxembourg .....       | 682              | 826 <sup>r</sup>   | 506                | 654 <sup>r</sup> | 343    |
| Brazil .....                   | 925              | 1,491              | 1,032              | 627              | 483    |
| Canada .....                   | 2,238            | 2,211 <sup>r</sup> | 2,254              | 1,872            | 1,827  |
| China .....                    | 861              | 1,244              | 2,247              | 2,384            | 2,047  |
| France .....                   | 3,300            | 4,359              | 3,912              | 3,339            | 2,857  |
| Germany .....                  | 2,800            | 3,939              | 3,044              | 1,764            | 1,612  |
| Israel .....                   | 503              | 738                | 957                | 967              | 994    |
| Italy .....                    | 737              | 1,051              | 1,214              | 547 <sup>r</sup> | 1,003  |
| Japan .....                    | 4,186            | 3,910              | 4,505              | 3,581            | 4,099  |
| Korea, South .....             | 1,113            | 1,716              | 1,716 <sup>r</sup> | 1,588            | 1,782  |
| Malaysia .....                 | 444              | 657                | 856                | 1,517            | 990    |
| Mexico .....                   | 462              | 608                | 991                | 554              | 631    |
| Netherlands .....              | 1,613            | 1,458              | 1,234              | 1,162            | 1,643  |
| Singapore .....                | 845 <sup>r</sup> | 1,278              | 1,067              | 1,485            | 1,839  |
| Spain .....                    | 1,198            | 972                | 776                | 417              | 528    |
| Sweden .....                   | 952              | 1,081              | 632                | 386              | 234    |
| Taiwan .....                   | 733              | 1,324              | 1,380 <sup>r</sup> | 2,133            | 1,790  |
| Turkey .....                   | 468              | 580                | 800                | 1,223            | 886    |
| United Kingdom .....           | 4,968            | 3,961              | 3,483              | 3,533            | 3,601  |

Source: U.S. Department of Commerce, International Trade Administration.

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

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

r Revised.

## U.S. IMPORTS OF AEROSPACE PRODUCTS<sup>a</sup> BY MAJOR COUNTRIES OF ORIGIN

Calendar Years 1990–1994  
(Millions of Dollars)

| Major Countries of Origin | 1990   | 1991               | 1992   | 1993   | 1994  |
|---------------------------|--------|--------------------|--------|--------|-------|
| Brazil .....              | \$ 360 | \$ 186             | \$ 164 | \$ 119 | \$ 73 |
| Canada .....              | 2,530  | 2,734              | 2,432  | 2,072  | 2,443 |
| France .....              | 2,782  | 3,558 <sup>r</sup> | 4,220  | 4,249  | 4,087 |
| Germany, West .....       | 712    | 523                | 614    | 478    | 699   |
| Israel .....              | 227    | 291                | 230    | 203    | 257   |
| Italy .....               | 418    | 598                | 585    | 368    | 274   |
| Japan .....               | 566    | 661                | 655    | 538    | 583   |
| Netherlands .....         | 368    | 761                | 915    | 707    | 505   |
| Sweden .....              | 317    | 332                | 234    | 135    | 96    |
| United Kingdom .....      | 2,700  | 2,499              | 2,805  | 2,523  | 2,546 |

Source: U.S. Department of Commerce, International Trade Administration.

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

r Revised.

## U.S. EXPORTS OF AEROSPACE PRODUCTS

Calendar Years 1991–1994

(Millions of Dollars)

| Aerospace Exports  | 1991            | 1992            | 1993            | 1994            |
|--|-----------------|-----------------|-----------------|-----------------|
| <b>TOTAL</b> .....                                       | 43,788          | 45,018          | 39,418          | 37,373          |
| <b>TOTAL CIVIL</b> .....                                 | 35,548          | 36,904          | 31,821          | 30,049          |
| <b>Complete Aircraft—TOTAL</b> .....                     | <u>22,385</u>   | <u>24,333</u>   | <u>19,844</u>   | <u>17,735</u>   |
| Transports .....   | 20,881          | 22,379          | 18,146          | 15,931          |
| General Aviation <sup>a</sup> .....                      | 576             | 581             | 551             | 598             |
| Helicopters .....  | 168             | 118             | 120             | 82              |
| Used Aircraft .....                                      | 738             | 1,244           | 1,014           | 1,113           |
| Other, Incl. Spacecraft <sup>b</sup> .....               | 176             | 180             | 293             | 309             |
| <b>Aircraft Engines—TOTAL</b> .....                      | <u>2,127</u>    | <u>2,346</u>    | <u>2,333</u>    | <u>2,386</u>    |
| Turbine Engines .....                                    | 2,050           | 2,271           | 2,246           | 2,292           |
| Piston Engines .....                                     | 77              | 74              | 87              | 94              |
| <b>Aircraft and Engine Parts</b>                         |                 |                 |                 |                 |
| <b>Incl. Spares—TOTAL</b> .....                          | <u>10,878</u>   | <u>10,048</u>   | <u>9,178</u>    | <u>9,628</u>    |
| Aircraft Parts & Accessories .....                       | 6,859           | 6,545           | 6,206           | 6,319           |
| Aircraft Engine Parts .....                              | 4,018           | 3,503           | 3,152           | 3,309           |
| <b>TOTAL MILITARY</b> .....                              | \$ 8,239        | \$ 8,114        | \$ 7,598        | \$ 7,324        |
| <b>Complete Aircraft—TOTAL<sup>c</sup></b> .....         | <u>\$ 1,788</u> | <u>\$ 2,086</u> | <u>\$ 1,462</u> | <u>\$ 1,096</u> |
| Fighters & Fighter Bombers .....                         | 323             | 1,288           | 764             | 248             |
| Transports .....   | 633             | 149             | —               | 140             |
| Helicopters .....  | 587             | 422             | 607             | 410             |
| Used Aircraft .....                                      | 146             | 81              | 46              | 270             |
| Other, Incl. Spacecraft <sup>b</sup> .....               | 253             | 315             | 313             | 303             |
| <b>Aircraft Engines—TOTAL</b> .....                      | <u>206</u>      | <u>229</u>      | <u>190</u>      | <u>251</u>      |
| Turbine Engines .....                                    | 171             | 199             | 155             | 188             |
| Piston Engines .....                                     | 35              | 30              | 35              | 63              |
| <b>Aircraft and Engine Parts</b>                         |                 |                 |                 |                 |
| <b>Incl. Spares—TOTAL</b> .....                          | <u>4,891</u>    | <u>4,208</u>    | <u>4,448</u>    | <u>4,692</u>    |
| Aircraft Parts & Accessories .....                       | 4,202           | 3,603           | 3,857           | 4,163           |
| Aircraft Engine Parts .....                              | 689             | 605             | 591             | 530             |
| <b>Guided Missiles, Rockets, &amp; Parts—TOTAL</b> ..... | <u>1,200</u>    | <u>1,422</u>    | <u>1,230</u>    | <u>1,009</u>    |
| Guided Missiles & Rockets .....                          | 298             | 576             | 485             | 340             |
| Missile & Rocket Parts .....                             | 899             | 839             | 745             | 669             |
| Missile & Rocket Engines .....                           | 3               | 6               | 1               | 1               |
| Missile & Rocket Engine Parts ..                         | —               | —               | —               | —               |

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

<sup>a</sup> All fixed-wing aircraft under 33,000 pounds.<sup>b</sup> Products within this category are not designated civil or military by the Harmonized Tariff Schedules. Historically, aircraft herein have been predominantly civil. Also, spacecraft not included in "Complete Aircraft—Total."<sup>c</sup> Includes aircraft exported under Military Assistance Programs and Foreign Military Sales.

## U.S. IMPORTS OF AEROSPACE PRODUCTS

Calendar Years 1991–1994  
(Millions of Dollars)

| Aerospace Imports  | 1991     | 1992     | 1993               | 1994     |
|--|----------|----------|--------------------|----------|
| <b>TOTAL</b> .....   | \$13,003 | \$13,662 | \$12,183           | \$12,363 |
| <b>TOTAL CIVIL</b> .....   | \$ 9,268 | \$ 9,719 | \$ 8,627           | \$ 8,792 |
| <b>Complete Aircraft—TOTAL</b> .....   | \$ 3,413 | \$ 3,866 | \$ 3,725           | \$ 3,787 |
| Transports .....   | 1,285    | 2,007    | 2,005              | 1,361    |
| General Aviation .....   | 1,567    | 1,375    | 1,238              | 1,711    |
| Helicopters .....  | 289      | 179      | 231                | 317      |
| Other, Including Used Aircraft, &<br>Gliders, Balloons, & Airships <sup>a</sup> .. | 272      | 305      | 251                | 398      |
| <b>Aircraft Engines—TOTAL</b> .....  | 1,226    | 1,346    | 1,312              | 1,400    |
| Turbine Engines <sup>b</sup> .....   | 1,185    | 1,330    | 1,291              | 1,346    |
| Piston Engines .....   | 42       | 16       | 20                 | 55       |
| <b>Aircraft &amp; Engine Parts—TOTAL</b> ...                                       | 4,629    | 4,507    | 3,590              | 3,605    |
| Aircraft Parts and Accessories <sup>b</sup> ...                                    | 3,166    | 2,726    | 2,059              | 2,093    |
| Turbine Engine Parts <sup>b</sup> .....  | 1,279    | 1,516    | 1,309              | 1,231    |
| Piston Engine Parts .....  | 43       | 46       | 39                 | 51       |
| Spacecraft, Other Parts &<br>Accessories <sup>c</sup> .....                        | 141      | 220      | 183                | 230      |
| <b>TOTAL MILITARY</b> .....  | \$ 3,735 | \$ 3,943 | \$ 3,555           | \$ 3,571 |
| <b>Complete Aircraft—TOTAL</b> .....   | \$ 26    | \$ 55    | \$ 13              | \$ 22    |
| <b>Aircraft Engines—TOTAL</b> .....  | 1,203    | 1,368    | 1,313 <sup>r</sup> | 1,386    |
| Turbine Engines <sup>b</sup> .....   | 1,185    | 1,330    | 1,291              | 1,346    |
| Piston Engines Including Parts ....  | 18       | 38       | 22 <sup>r</sup>    | 40       |
| <b>Aircraft &amp; Engine Parts—TOTAL</b> ...                                       | 2,507    | 2,521    | 2,229              | 2,163    |
| Aircraft Parts <sup>b</sup> .....  | 1,033    | 717      | 655                | 635      |
| Turbine Engine Parts <sup>b</sup> .....  | 1,238    | 1,484    | 1,285              | 1,212    |
| Spacecraft, Missiles, Rockets,<br>Other Parts, & Accessories <sup>bc</sup> ...     | 236      | 320      | 289                | 317      |

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

NOTE: International trade reported using Harmonized Tariff Schedules after 1989.

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

b Category contains products whose use (civil or military) is unspecified by the Harmonized Tariff Schedules. Figures for those products distributed equally between civil and military.

c Includes satellites, propulsion engines, and parachutes.

r Revised.

**U.S. EXPORTS OF MILITARY AIRCRAFT<sup>a</sup>**  
**Calendar Years 1990–1994**

|  | 1990    | 1991    | 1992    | 1993    | 1994    |
|--|---------|---------|---------|---------|---------|
| <b>TOTAL NUMBER OF AIRCRAFT</b> ...        | 445     | 490     | 428     | 632     | 437     |
| Fighters and Fighter Bombers .....         | 39      | 16      | 65      | 47      | 14      |
| Transports .....                           | 43      | 40      | 4       | —       | 3       |
| Helicopters .....                          | 47      | 72      | 61      | 93      | 88      |
| New Aircraft, NEC .....                    | 258     | 227     | 201     | 378     | 241     |
| Used or Rebuilt Aircraft .....             | 58      | 135     | 97      | 114     | 91      |
| <b>TOTAL VALUE</b> (Millions of Dollars) . | \$1,481 | \$1,784 | \$2,083 | \$1,460 | \$1,094 |
| Fighters and Fighter Bombers .....         | \$ 533  | \$ 323  | \$1,288 | \$ 764  | \$ 248  |
| Transports .....                           | 432     | 633     | 149     | —       | 140     |
| Helicopters .....                          | 381     | 587     | 422     | 607     | 410     |
| New Aircraft, NEC .....                    | 60      | 97      | 51      | 32      | 28      |
| Used or Rebuilt Aircraft .....             | 75      | 144     | 174     | 57      | 268     |

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.

r Revised

**U.S. EXPORTS OF CIVIL AIRCRAFT**  
Calendar Years 1990-1994

| Civil Aircraft Exports  | 1990            | 1991            | 1992            | 1993            | 1994            |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>TOTAL NUMBER OF AIRCRAFT<sup>a</sup> ..</b>                | <b>3,375</b>    | <b>3,071</b>    | <b>1,988</b>    | <b>1,533</b>    | <b>1,437</b>    |
| <b>Helicopters—TOTAL .....</b>                                | <b>349</b>      | <b>318</b>      | <b>212</b>      | <b>175</b>      | <b>154</b>      |
| Under 2,200 lbs .....   | 266             | 246             | 175             | 143             | 118             |
| Over 2,200 lbs .....  | 83              | 72              | 37              | 32              | 36              |
| <b>General Aviation—TOTAL .....</b>                           | <b>809</b>      | <b>534</b>      | <b>358</b>      | <b>333</b>      | <b>385</b>      |
| Single-Engine .....   | 561             | 345             | 186             | 97              | 125             |
| Multi-Engine, Under 4,400 lbs ...                             | 33              | 22              | 19              | 104             | 124             |
| Multi-Engine, 4,400-10,000 lbs ..                             | 136             | 98              | 93              | 74              | 67              |
| Multi-Engine, 10,000-33,000 lbs .                             | 79              | 69              | 60              | 58              | 69              |
| <b>Transports—TOTAL .....</b>                                 | <b>306</b>      | <b>385</b>      | <b>387</b>      | <b>278</b>      | <b>222</b>      |
| Passenger Aircraft, Over<br>33,000 lbs .....                  | 294             | 371             | 376             | 272             | 216             |
| Cargo Aircraft, Over 33,000 lbs ..                            | 3               | 5               | 1               | 2               | 4               |
| Other, Over 33,000 lbs, Incl.<br>Pass./Cargo Combi .....      | 9               | 9               | 10              | 4               | 2               |
| <b>Other Aircraft—TOTAL<sup>a</sup> .....</b>                 | <b>1,911</b>    | <b>1,834</b>    | <b>1,031</b>    | <b>747</b>      | <b>676</b>      |
| Used or Rebuilt Aircraft .....                                | 1,911           | 1,834           | 1,031           | 747             | 676             |
| Other Aircraft, Including<br>Balloons, Gliders, & Kites ..... | 1,448           | 1,133           | 386             | 452             | 451             |
| <b>TOTAL VALUE (Millions of Dollars)</b>                      | <b>\$18,150</b> | <b>\$22,385</b> | <b>\$24,333</b> | <b>\$19,844</b> | <b>\$17,735</b> |
| <b>Helicopters—TOTAL .....</b>                                | <b>\$ 161</b>   | <b>\$ 168</b>   | <b>\$ 118</b>   | <b>\$ 120</b>   | <b>\$ 82</b>    |
| Under 2,200 lbs .....   | 39              | 40              | 35              | 37              | 24              |
| Over 2,200 lbs .....  | 123             | 129             | 83              | 83              | 58              |
| <b>General Aviation—TOTAL .....</b>                           | <b>555</b>      | <b>576</b>      | <b>581</b>      | <b>551</b>      | <b>598</b>      |
| Single-Engine .....   | 44              | 40              | 61              | 36              | 46              |
| Multi-Engine, Under 4,400 lbs ...                             | 10              | 8               | 12              | 22              | 23              |
| Multi-Engine, 4,400-10,000 lbs ..                             | 256             | 249             | 213             | 169             | 182             |
| Multi-Engine, 10,000-33,000 lbs .                             | 245             | 279             | 295             | 324             | 348             |
| <b>Transports—TOTAL .....</b>                                 | <b>16,691</b>   | <b>20,881</b>   | <b>22,379</b>   | <b>18,146</b>   | <b>15,931</b>   |
| Passenger Aircraft, Over<br>33,000 lbs .....                  | 15,307          | 19,349          | 21,252          | 17,237          | 15,063          |
| Cargo Aircraft, Over 33,000 lbs ..                            | 264             | 405             | 37              | 299             | 556             |
| Other, Over 33,000 lbs, Incl.<br>Pass/Cargo Combi .....       | 1,121           | 1,127           | 1,090           | 611             | 312             |
| <b>Other Aircraft—TOTAL .....</b>                             | <b>742</b>      | <b>760</b>      | <b>1,256</b>    | <b>1,027</b>    | <b>1,124</b>    |
| Used or Rebuilt Aircraft .....                                | 712             | 738             | 1,244           | 1,014           | 1,113           |
| Other Aircraft, Including<br>Balloons, Gliders, & Kites ..... | 30              | 23              | 12              | 12              | 11              |

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

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

a Numbers of gliders, balloons, & kites excluded from civil aircraft totals.



## U.S. IMPORTS OF COMPLETE AIRCRAFT

Calendar Years 1991–1994

| Aircraft Imports   | 1991                  | 1992                  | 1993                  | 1994                  |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| <b>TOTAL NUMBER OF AIRCRAFT</b> . . . . .                                | 1,036                 | 1,024                 | 1,384                 | 1,762                 |
| <b>Civil Aircraft—TOTAL</b> . . . . .                                    | <u>955</u>            | <u>949</u>            | <u>1,330</u>          | <u>1,679</u>          |
| New Complete Aircraft:   |                       |                       |                       |                       |
| Helicopters . . . . .  | 244                   | 148                   | 159                   | 216                   |
| General Aviation:  |                       |                       |                       |                       |
| Single-Engine . . . . .  | 72                    | 67                    | 96                    | 105                   |
| Multi-Engine, Under 4,400 lbs . . . . .                                  | 1                     | 7                     | —                     | 8                     |
| Multi-Engine, 4,400-10,000 lbs . . . . .                                 | 41                    | 18                    | 6                     | 2                     |
| Multi-Engine, Turbojet/Turbofan,<br>10,000-33,000 lbs . . . . .          | 45                    | 52                    | 66                    | 82                    |
| Multi-Engine, Other, Including<br>Turbohaft, 10,000-33,000 lbs . . . . . | 95                    | 72                    | 44                    | 64                    |
| Transports, Multi-Engine, Over<br>33,000 lbs . . . . .                   | 44                    | 64                    | 54                    | 38                    |
| Other Civil Aircraft:  |                       |                       |                       |                       |
| Used or Rebuilt . . . . .  | 246                   | 176                   | 258                   | 328                   |
| Aircraft Previously Exported<br>from U.S. . . . .                        | NA                    | NA                    | NA                    | NA                    |
| Gliders <sup>a</sup> . . . . .   | 140                   | 327                   | 587                   | 783                   |
| Balloons & Airships <sup>a</sup> . . . . .                               | 27                    | 18                    | 60                    | 53                    |
| <b>Military Aircraft—TOTAL</b> . . . . .                                 | <u>81<sup>b</sup></u> | <u>75<sup>b</sup></u> | <u>54<sup>b</sup></u> | <u>84<sup>b</sup></u> |
| New Complete Aircraft . . . . .  | 8                     | 11                    | 3                     | 21                    |

(Continued on next page)

## U.S. IMPORTS OF COMPLETE AIRCRAFT

(Continued)

| Aircraft Imports   | 1991                       | 1992                       | 1993                       | 1994                       |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| <b>VALUE</b> (Millions of Dollars) . . . . .                             | \$3,438.1                  | \$3,920.7                  | \$3,738.3                  | \$3,808.8                  |
| <b>Civil Aircraft—TOTAL</b> . . . . .                                    | <u>\$3,412.7</u>           | <u>\$3,866.2</u>           | <u>\$3,725.2</u>           | <u>\$3,786.6</u>           |
| New Complete Aircraft:   |                            |                            |                            |                            |
| Helicopters . . . . .  | 288.8                      | 179.2                      | 231.4                      | 316.7                      |
| General Aviation:  |                            |                            |                            |                            |
| Single-Engine . . . . .  | 23.4                       | 24.6                       | 28.6                       | 65.9                       |
| Multi-Engine, Under 4,400 lbs . . . . .                                  | 0.0                        | 3.1                        | —                          | 2.8                        |
| Multi-Engine, 4,400-10,000 lbs . . . . .                                 | 176.3                      | 75.7                       | 14.8                       | 2.4                        |
| Multi-Engine, Turbojet/Turbofan,<br>10,000-33,000 lbs . . . . .          | 526.9                      | 612.0                      | 792.3                      | 1,030.4                    |
| Multi-Engine, Other, Including<br>Turbohaft, 10,000-33,000 lbs . . . . . | 840.3                      | 659.5                      | 402.1                      | 609.4                      |
| Transports, Multi-Engine, Over<br>33,000 lbs . . . . .                   | 1,285.3                    | 2,006.9                    | 2,005.1                    | 1,361.3                    |
| Other Civil Aircraft:  |                            |                            |                            |                            |
| Used or Rebuilt . . . . .  | 269.5                      | 301.4                      | 245.7                      | 390.5                      |
| Aircraft Previously Exported<br>from U.S. . . . .                        | —                          | —                          | —                          | —                          |
| Gliders <sup>a</sup> . . . . .   | 0.9                        | 2.3                        | 2.1                        | 2.3                        |
| Balloons & Airships <sup>a</sup> . . . . .                               | 1.3                        | 1.4                        | 3.2                        | 4.7                        |
| <b>Military Aircraft—TOTAL</b> . . . . .                                 | <u>\$ 25.5<sup>b</sup></u> | <u>\$ 54.6<sup>b</sup></u> | <u>\$ 13.1<sup>b</sup></u> | <u>\$ 22.2<sup>b</sup></u> |
| New Complete Aircraft . . . . .  | 21.0                       | 46.0                       | 9.9                        | 13.6                       |

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

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

b Includes used aircraft.

NA Not available.

**U.S. EXPORTS OF COMMERCIAL TRANSPORT AIRCRAFT<sup>a</sup>**  
**Calendar Years 1990–1994**

| <b>Region of Destination</b>                          | <b>1990</b> | <b>1991</b> | <b>1992</b> | <b>1993</b> | <b>1994</b> |
|---|-------------|-------------|-------------|-------------|-------------|
| <b>TOTAL NUMBER EXPORTED . . . .</b>                  | 306         | 385         | 387         | 278         | 222         |
| Canada & Greenland . . . . .                          | 4           | 3           | 7           | 2           | —           |
| Latin America & Caribbean . . . . .                   | 25          | 32          | 40          | 14          | 8           |
| Europe . . . . .                                      | 172         | 228         | 171         | 89          | 82          |
| Middle East . . . . .                                 | 9           | 16          | 17          | 13          | 13          |
| Asia . . . . .  | 70          | 83          | 120         | 146         | 108         |
| Oceania . . . . .                                     | 16          | 14          | 23          | 8           | 7           |
| Africa . . . . .                                      | 10          | 9           | 9           | 6           | 4           |
| <b>TOTAL VALUE</b><br>(Millions of Dollars) . . . . . | \$16,691    | \$20,881    | \$22,379    | \$18,146    | \$15,931    |
| Canada & Greenland . . . . .                          | \$ 309      | \$ 221      | \$ 610      | \$ 114      | \$ —        |
| Latin America & Caribbean . . . . .                   | 1,001       | 1,472       | 1,904       | 805         | 420         |
| Europe . . . . .                                      | 8,166       | 10,461      | 8,105       | 5,130       | 5,451       |
| Middle East . . . . .                                 | 440         | 648         | 625         | 517         | 957         |
| Asia . . . . .  | 5,010       | 6,382       | 9,201       | 10,840      | 8,451       |
| Oceania . . . . .                                     | 1,256       | 1,177       | 1,461       | 351         | 510         |
| Africa . . . . .                                      | 509         | 520         | 471         | 389         | 144         |

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

U.S. EXPORTS OF CIVIL HELICOPTERS<sup>a</sup>

Calendar Years 1990–1994

| Region of Destination                                 | 1990    | 1991    | 1992    | 1993    | 1994   |
|---|---------|---------|---------|---------|--------|
| <b>TOTAL NUMBER EXPORTED</b> . . . .                  | 349     | 318     | 212     | 175     | 154    |
| Canada & Greenland . . . . .                          | 11      | 20      | 8       | 11      | 5      |
| Latin America & Caribbean . . . . .                   | 46      | 45      | 46      | 67      | 43     |
| Europe . . . . .                                      | 140     | 125     | 91      | 61      | 62     |
| Middle East . . . . .                                 | 1       | 2       | 3       | 2       | 2      |
| Asia . . . . .  | 65      | 66      | 39      | 21      | 26     |
| Oceania . . . . .                                     | 68      | 38      | 19      | 13      | 11     |
| Africa . . . . .                                      | 18      | 22      | 6       | —       | 5      |
| <b>TOTAL VALUE</b><br>(Millions of Dollars) . . . . . | \$161.2 | \$168.4 | \$117.7 | \$120.1 | \$82.1 |
| Canada & Greenland . . . . .                          | \$ 5.1  | \$ 7.9  | \$ 5.0  | \$ 6.2  | \$ 1.9 |
| Latin America & Caribbean . . . . .                   | 20.1    | 19.6    | 26.2    | 24.8    | 20.0   |
| Europe . . . . .                                      | 46.8    | 56.3    | 38.2    | 62.2    | 18.7   |
| Middle East . . . . .                                 | 3.6     | 16.5    | 2.2     | 0.5     | 0.6    |
| Asia . . . . .  | 71.3    | 59.2    | 42.5    | 24.4    | 30.8   |
| Oceania . . . . .                                     | 8.7     | 5.7     | 2.3     | 1.9     | 9.0    |
| Africa . . . . .                                      | 5.6     | 3.1     | 1.3     | —       | 1.2    |

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

a Excludes used helicopters.

U.S. IMPORTS OF CIVIL HELICOPTERS<sup>a</sup>

Calendar Years 1990–1994

| Country of Origin                                     | 1990    | 1991    | 1992    | 1993                 | 1994    |
|---|---------|---------|---------|----------------------|---------|
| <b>TOTAL NUMBER IMPORTED</b> . . . .                  | 167     | 244     | 148     | 159                  | 216     |
| Canada . . . . .                                      | 82      | 146     | 104     | 114                  | 169     |
| France . . . . .                                      | 49      | 57      | 25      | 22                   | 29      |
| Germany . . . . .                                     | 25      | 30      | 16      | 18                   | 14      |
| Italy . . . . .                                       | 11      | 10      | 1       | 3                    | 2       |
| Others <sup>b</sup> . . . . .                         | —       | 1       | 2       | 2                    | 2       |
| <b>TOTAL VALUE</b><br>(Millions of Dollars) . . . . . | \$162.4 | \$288.8 | \$179.2 | \$231.4 <sup>r</sup> | \$316.7 |
| Canada . . . . .                                      | \$ 86.3 | \$182.1 | \$147.4 | \$176.1              | \$274.6 |
| France . . . . .                                      | 29.9    | 53.6    | 14.0    | 28.6                 | 29.6    |
| Germany . . . . .                                     | 34.9    | 35.6    | 14.8    | 15.0                 | 11.7    |
| Italy . . . . .                                       | 11.3    | 16.9    | 2.1     | 9.1                  | 0.0     |
| Others <sup>b</sup> . . . . .                         | —       | 0.7     | 0.9     | 2.5                  | 0.8     |

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

a Excludes used helicopters.

b Includes 1 from New Zealand in 1991; 2 from Japan in 1992; 1 from Japan and 1 from Russia in 1993; and 2 from United Kingdom in 1994.

r Revised.

**U.S. EXPORTS OF GENERAL AVIATION AIRCRAFT<sup>a</sup>**

Calendar Years 1990–1994

| Region of Destination                             | 1990    | 1991    | 1992    | 1993    | 1994    |
|---|---------|---------|---------|---------|---------|
| <b>TOTAL NUMBER EXPORTED ..</b>                   | 809     | 534     | 358     | 333     | 385     |
| Canada & Greenland .....                          | 34      | 9       | 21      | 20      | 29      |
| Latin America & Caribbean ....                    | 133     | 80      | 78      | 59      | 81      |
| Europe .....                                      | 379     | 317     | 142     | 115     | 94      |
| Middle East .....                                 | 15      | 11      | 13      | 16      | 28      |
| Asia .....  | 55      | 54      | 47      | 77      | 91      |
| Oceania .....                                     | 72      | 18      | 22      | 15      | 25      |
| Africa .....                                      | 121     | 45      | 35      | 31      | 37      |
| <b>TOTAL VALUE</b><br>(Millions of Dollars) ..... | \$554.9 | \$576.0 | \$580.8 | \$550.5 | \$598.2 |
| Canada & Greenland .....                          | \$ 41.7 | \$ 31.2 | \$ 55.3 | \$ 27.5 | \$ 44.9 |
| Latin America & Caribbean ....                    | 152.8   | 142.9   | 191.8   | 117.5   | 203.1   |
| Europe .....                                      | 197.1   | 253.1   | 169.5   | 163.4   | 128.1   |
| Middle East .....                                 | 18.1    | 21.7    | 17.9    | 65.2    | 13.0    |
| Asia .....  | 47.9    | 95.0    | 36.3    | 106.8   | 112.6   |
| Oceania .....                                     | 22.0    | 6.9     | 41.0    | 27.2    | 51.7    |
| Africa .....                                      | 75.3    | 25.2    | 69.0    | 42.9    | 44.9    |

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

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

U.S. IMPORTS OF GENERAL AVIATION AIRCRAFT<sup>a</sup>

Calendar Years 1990–1994

| Country of Origin                                 | 1990             | 1991             | 1992             | 1993             | 1994             |
|---|------------------|------------------|------------------|------------------|------------------|
| <b>TOTAL NUMBER IMPORTED ...</b>                  | 301              | 254              | 216              | 212              | 261              |
| Brazil .....                                      | 51               | 24               | 21               | 15               | 7                |
| Canada .....                                      | 32               | 42               | 50               | 33               | 50               |
| France .....                                      | 93               | 92               | 81               | 66               | 63               |
| Germany, West .....                               | (b)              | (b)              | 4                | 14               | 41               |
| Israel .....                                      | 12               | 8                | 5                | 7                | 5                |
| Japan .....                                       | —                | —                | —                | 2                | —                |
| Poland .....                                      | (b)              | (b)              | 4                | 20               | 23               |
| Russia .....                                      | (b)              | (b)              | 5                | 20               | 14               |
| United Kingdom .....                              | 77               | 48               | 37               | 26               | 40               |
| Other .....                                       | 36               | 40               | 9                | 9                | 18               |
| <b>TOTAL VALUE</b><br>(Millions of Dollars) ..... | <b>\$1,581.2</b> | <b>\$1,566.8</b> | <b>\$1,374.9</b> | <b>\$1,237.8</b> | <b>\$1,711.0</b> |
| Brazil .....                                      | \$ 306.9         | \$ 152.2         | \$ 136.3         | \$ 94.2          | \$ 49.5          |
| Canada .....                                      | 354.7            | 469.8            | 527.2            | 466.2            | 625.4            |
| France .....                                      | 336.2            | 469.9            | 388.9            | 410.4            | 556.3            |
| Germany, West .....                               | (b)              | (b)              | 0.6              | 2.2              | 156.8            |
| Israel .....                                      | 70.6             | 51.7             | 33.6             | 45.9             | 29.7             |
| Japan .....                                       | —                | —                | —                | 1.0              | —                |
| Poland .....                                      | (b)              | (b)              | 0.3              | 1.9              | 1.9              |
| Russia .....                                      | (b)              | (b)              | 0.6              | 2.0              | 1.7              |
| United Kingdom .....                              | 414.6            | 276.9            | 235.1            | 201.6            | 277.7            |
| Other .....                                       | 98.1             | 146.3            | 52.3             | 12.4             | 172.4            |

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

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

b Previously included in Other.

**U.S. EXPORTS OF AIRCRAFT ENGINES**

Calendar Years 1992–1994  
(Values in Millions of Dollars)

|                              | 1992   |         | 1993   |         | 1994   |         |
|------------------------------|--------|---------|--------|---------|--------|---------|
|                              | Number | Value   | Number | Value   | Number | Value   |
| <b>TOTAL</b> .....           | 10,742 | \$2,575 | 10,633 | \$2,524 | 9,226  | \$2,637 |
| <b>Turbine Engines</b> ..... | 3,464  | \$2,471 | 3,020  | \$2,401 | 2,428  | \$2,480 |
| Civil .....                  | 2,250  | 2,271   | 2,283  | 2,246   | 1,903  | 2,292   |
| Military .....               | 1,214  | 199     | 737    | 155     | 525    | 188     |
| <b>Piston Engines</b> .....  | 7,278  | 104     | 7,613  | 123     | 6,798  | 157     |
| Civil, New, Under 500 HP .   | 782    | 13      | 703    | 13      | 895    | 20      |
| Civil, New, Over 500 HP ..   | 115    | 3       | 98     | 5       | 123    | 3       |
| Civil, Used .....            | 3,743  | 58      | 3,792  | 69      | 2,462  | 70      |
| Military .....               | 2,638  | 30      | 3,020  | 35      | 3,318  | 63      |

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

**U.S. IMPORTS OF AIRCRAFT ENGINES<sup>a</sup>**

Calendar Years 1992–1994  
(Values in Millions of Dollars)

|                              | 1992   |         | 1993   |         | 1994   |         |
|------------------------------|--------|---------|--------|---------|--------|---------|
|                              | Number | Value   | Number | Value   | Number | Value   |
| <b>Turbine Engines</b> ..... | 1,961  | \$2,660 | 2,401  | \$2,583 | 2,297  | \$2,691 |
| <b>Piston Engines</b> .....  | 2,987  | 43      | 2,517  | 31      | 4,460  | 84      |
| Military .....               | 1,828  | 27      | 2,182  | 11      | 2,475  | 30      |
| Civil, New, Small .....      | 337    | 1       | 124    | 1       | 165    | 1       |
| Civil, New, Large .....      | 466    | 1       | 33     | 6       | 1,545  | 42      |
| Civil, Used .....            | 356    | 14      | 178    | 14      | 275    | 12      |

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

a New and used.

**EXPORT-IMPORT BANK LENDING AUTHORITY  
AND GROSS AUTHORIZATIONS SUMMARY**

Fiscal Years 1984–1994  
(Millions of Dollars)

**LOANS**

| Year | Lending Authority | Authorizations Summary    |                |                    |
|------|-------------------|---------------------------|----------------|--------------------|
|      |                   | Direct Loans <sup>a</sup> |                |                    |
|      |                   | TOTAL                     | Direct Credits | Other <sup>b</sup> |
| 1984 | \$ 3,865          | \$ 1,465                  | \$1,122        | \$ 343             |
| 1985 | 3,865             | 659                       | 320            | 339                |
| 1986 | 1,059             | 578                       | 371            | 207                |
| 1987 | 680               | 599                       | 332            | 267                |
| 1988 | 693               | 685                       | 465            | 220                |
| 1989 | 719               | 695                       | 517            | 202                |
| 1990 | 614               | 614                       | 318            | 296                |
| 1991 | 750               | 777                       | 425            | 352                |
| 1992 | (c)               | 817                       | 661            | 156                |
| 1993 | (c)               | 1,748                     | 1,635          | 113                |
| 1994 | (c)               | 3,016                     | 2,980          | 37                 |

**GUARANTEES AND INSURANCE**

| Year | Lending Authority   | Authorizations Summary |            |           |
|------|---------------------|------------------------|------------|-----------|
|      |                     | TOTAL                  | Guarantees | Insurance |
| 1984 | \$10,000            | \$ 7,151               | \$1,333    | \$5,818   |
| 1985 | 10,000              | 7,850                  | 1,320      | 6,530     |
| 1986 | 11,484 <sup>d</sup> | 5,508                  | 1,128      | 4,380     |
| 1987 | 11,355              | 7,958                  | 1,514      | 6,444     |
| 1988 | 13,406              | 5,735                  | 601        | 5,134     |
| 1989 | 17,901              | 5,637                  | 1,292      | 4,345     |
| 1990 | 10,191              | 8,174                  | 3,333      | 4,841     |
| 1991 | 11,349              | 10,588                 | 6,034      | 4,554     |
| 1992 | (c)                 | 11,521                 | 7,301      | 4,220     |
| 1993 | (c)                 | 13,324                 | 9,095      | 4,229     |
| 1994 | (c)                 | 11,870                 | 7,609      | 4,261     |

Source: Export-Import Bank of the United States.

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

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

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

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



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

Fiscal Years 1980–1994

(Millions of Dollars)

| Year                     | TOTAL AUTHORIZATIONS | Authorizations in Support of Aircraft Exports |                                 |                                      |                             |
|--------------------------|----------------------|---|---------------------------------|--------------------------------------|-----------------------------|
|                          |                      | TOTAL   | Percent of TOTAL Authorizations | Commercial Jet Aircraft <sup>a</sup> | Other Aircraft <sup>b</sup> |
| <b>LOANS<sup>c</sup></b> |                      |   |                                 |                                      |                             |
| 1980                     | \$4,578              | \$1,743.3                                     | 38.1%                           | \$1,692.6                            | \$ 50.7                     |
| 1981                     | 5,431                | 2,576.6                                       | 47.4                            | 2,550.3                              | 26.3                        |
| 1982                     | 3,516                | 263.9   | 7.5                             | 199.1                                | 64.8                        |
| 1983                     | 845                  | 396.7   | 46.9                            | 383.8                                | 12.9                        |
| 1984                     | 1,465                | 608.0   | 41.5                            | 531.8                                | 76.2                        |
| 1985                     | 659                  | 39.7  | 6.0                             | 12.6                                 | 27.1                        |
| 1986                     | 578                  | 54.6  | 9.4                             | 46.4                                 | 8.2                         |
| 1987                     | 599                  | 17.0  | 2.8                             | 13.3                                 | 3.7                         |
| 1988                     | 685                  | —   | —                               | —                                    | —                           |
| 1989                     | 695                  | 166.4   | 23.9                            | 158.0                                | 8.4                         |
| 1990                     | 614                  | 5.0   | 0.8                             | —                                    | 5.0                         |
| 1991                     | 777                  | —   | —                               | —                                    | —                           |
| 1992                     | 817                  | —   | —                               | —                                    | —                           |
| 1993                     | 1,748                | —   | —                               | —                                    | —                           |
| 1994                     | 3,016                | —   | —                               | —                                    | —                           |
| <b>GUARANTEES</b>        |                      |   |                                 |                                      |                             |
| 1980                     | \$2,510              | \$1,131.9                                     | 45.1%                           | \$1,088.1                            | \$ 43.8                     |
| 1981                     | 1,506                | 562.6   | 37.4                            | 533.4                                | 29.2                        |
| 1982                     | 727                  | 104.2   | 14.3                            | 78.4                                 | 25.8                        |
| 1983                     | 1,741                | 629.6   | 36.2                            | 601.3                                | 28.3                        |
| 1984                     | 1,333                | 355.5   | 26.7                            | 293.5                                | 62.0                        |
| 1985                     | 1,320                | 322.4   | 24.4                            | 288.9                                | 33.5                        |
| 1986                     | 1,128                | 329.2   | 29.2                            | 277.4                                | 51.8                        |
| 1987                     | 1,514                | 808.3   | 53.4                            | 808.3                                | —                           |
| 1988                     | 601                  | 89.2  | 14.8                            | 73.4                                 | 15.8                        |
| 1989                     | 1,292                | 496.4   | 38.4                            | 390.4                                | 106.0                       |
| 1990                     | 3,333                | 1,666.3                                       | 50.0                            | 224.7                                | 1,441.6                     |
| 1991                     | 6,034                | 606.0   | 10.1                            | 566.9                                | 40.0                        |
| 1992                     | 7,301                | 1,667.0                                       | 22.8                            | 1,597.1                              | 69.9                        |
| 1993                     | 9,095                | 3,488.6                                       | 38.4                            | 3,488.6                              | —                           |
| 1994                     | 7,609                | 2,959.0                                       | 38.9                            | 2,959.0                              | —                           |

Source: Export-Import Bank of the United States.

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

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

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

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

**EXPORT-IMPORT BANK  
SUMMARY OF COMMERCIAL JET AIRCRAFT AUTHORIZATIONS  
FOR LOANS<sup>a</sup> AND GUARANTEES<sup>b</sup>**

Fiscal Years 1976–1994  
(Values in Millions of Dollars)

| Year                       | No. of Jet Aircraft <sup>c</sup> |            | Export Value <sup>c</sup> |            | No. of New Commitments |            | Gross Authorizations |                  |
|----------------------------|----------------------------------|------------|---------------------------|------------|------------------------|------------|----------------------|------------------|
|                            | Loans                            | Guarantees | Loans                     | Guarantees | Loans                  | Guarantees | Loans                | Guarantees       |
| <b>New Authorizations:</b> |                                  |            |                           |            |                        |            |                      |                  |
| 1976                       | 77                               | 6          | \$1,017                   | \$ 139     | 34                     | 11         | \$ 398               | \$ 87            |
| Tr.Qtr.                    | 15                               | 5          | 219                       | 182        | 6                      | 3          | 94                   | 59               |
| 1977                       | 31                               | 25         | 330                       | 902        | 16                     | 14         | 138                  | 294              |
| 1978                       | 29                               | 5          | 479                       | 253        | 18                     | 5          | 189                  | 77               |
| 1979                       | 118                              | 7          | 2,938                     | 317        | 35                     | 10         | 1,399                | 239              |
| 1980                       | 136                              | 21         | 3,975                     | 901        | 36                     | 24         | 1,693                | 1,088            |
| 1981                       | 121                              | 18         | 4,568                     | 637        | 26                     | 17         | 2,550                | 533              |
| 1982                       | 11                               | 6          | 441                       | 113        | 5                      | 2          | 199                  | 78               |
| 1983                       | 21                               | 9          | 779                       | 619        | 3                      | 4          | 384                  | 601              |
| 1984                       | 37                               | 8          | 1,023                     | 327        | 7                      | 4          | 532                  | 294              |
| 1985                       | —                                | 14         | 19                        | 481        | 1                      | 5          | 13                   | 289              |
| 1986                       | 3                                | 13         | 74                        | 451        | 1                      | 9          | 46                   | 277              |
| 1987                       | —                                | 27         | 22                        | 1,449      | 1                      | 14         | 13                   | 808              |
| 1988                       | —                                | 2          | —                         | 94         | —                      | 2          | —                    | 73               |
| 1989                       | 3                                | 5          | 253                       | 459        | 1                      | 2          | 158 <sup>r</sup>     | 390 <sup>r</sup> |
| 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            |

Source: Export-Import Bank of the United States.

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

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

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

r Revised.

Tr.Qtr. See Glossary.

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

Fiscal Years 1993-1994  
(Values in Millions of Dollars)

| Customer<br>(Country/Airline)                         | Number and<br>Aircraft Model<br>or<br>Related Product | Export<br>Value | Authorizations            |                                       |                  |                                      |         |
|---|---|-----------------|---------------------------|---------------------------------------|------------------|--------------------------------------|---------|
|   |   |                 | Loans<br>(Direct Credits) |                                       |                  | Guarantees                           |         |
|   |   |                 | Amount                    | Percent<br>Cover-<br>age <sup>a</sup> | Interest<br>Rate | Repay-<br>ment<br>Terms <sup>b</sup> | Amount  |
| <b>FY 1994</b>  |   |                 |                           |                                       |                  |                                      |         |
| <b>TOTALS</b> .....                                   | 59 aircraft   | \$3,507         | —                         | —                                     | —                | —                                    | \$2,959 |
| Australia/Ansett Worldwide<br>Aviation Services ..... | 3 x 737,<br>3 x 757,<br>1 x 767                       | \$ 299          | —                         | —                                     | —                | —                                    | \$ 227  |
| Brazil/Varig .....                                    | 2 x MD-11   | 209             | —                         | —                                     | —                | —                                    | 178     |
| China/China Eastern<br>Airlines .....                 | 1 x MD-11   | 118             | —                         | —                                     | —                | —                                    | 98      |
| China/China Southern<br>Airlines .....                | 9 x 737,<br>2 x 757                                   | 380             | —                         | —                                     | —                | —                                    | 325     |
| China/China Southwest<br>Airlines .....               | 2 x 737,<br>4 x 757                                   | 233             | —                         | —                                     | —                | —                                    | 199     |
| China/China Xinhua<br>Airlines .....                  | 4 x 737   | 139             | —                         | —                                     | —                | —                                    | 118     |
| China/China Xinjiang<br>Airlines .....                | 3 x 737   | 97              | —                         | —                                     | —                | —                                    | 82      |
| China/Shanghai Airlines ..                            | 1 x 757   | 48              | —                         | —                                     | —                | —                                    | 41      |
| Hong Kong/Cathay<br>Pacific Airways .....             | 2 x 747   | 217             | —                         | —                                     | —                | —                                    | 185     |
| Italy/Alitalia-Linee Aeree<br>Italiane .....          | 2 x MD-11,<br>7 x MD-80                               | 439             | —                         | —                                     | —                | —                                    | 370     |
| Korea/Asiana Airlines ....                            | 3 x 747,<br>1 x 767                                   | 499             | —                         | —                                     | —                | —                                    | 427     |
| Korea/Korean Airlines ....                            | 3 x 747   | 386             | —                         | —                                     | —                | —                                    | 328     |
| Morocco/Royal Air Maroc                               | 2 x 737   | 69              | —                         | —                                     | —                | —                                    | 59      |
| Philippines/Philippine<br>Airlines .....              | 2 x 747   | 258             | —                         | —                                     | —                | —                                    | 220     |
| Poland/LOT Polish Airlines                            | 1 x 737,<br>1 x 767                                   | 117             | —                         | —                                     | —                | —                                    | 100     |

(Continued on next page)

**EXPORT-IMPORT BANK  
LOAN AND GUARANTEE AUTHORIZATIONS  
(Continued)**

| Customer<br>(Country/Airline)                       | Number and<br>Aircraft Model<br>or Related<br>Product | Export<br>Value | Authorizations            |                                       |                  |                                      |         |
|---|---|-----------------|---------------------------|---------------------------------------|------------------|--------------------------------------|---------|
|   |   |                 | Loans<br>(Direct Credits) |                                       |                  | Guar-<br>antees                      |         |
|   |   |                 | Amount                    | Percent<br>Cover-<br>age <sup>a</sup> | Interest<br>Rate | Repay-<br>ment<br>Terms <sup>b</sup> | Amount  |
| <b>FY 1993</b>                                      |   |                 |                           |                                       |                  |                                      |         |
| <b>TOTALS</b> .....                                 | 70 aircraft   | \$4,122         | —                         | —                                     | —                | —                                    | \$3,489 |
| Argentina/Various .....                             | 7 x MD-80   | \$ 206          | —                         | —                                     | —                | —                                    | \$ 176  |
| Australia/Australian Airlines                       | 2 x 737   | 64              | —                         | —                                     | —                | —                                    | 55      |
| Austria/Lauda Air .....                             | 1 x 737,<br>1 x 767                                   | 107             | —                         | —                                     | —                | —                                    | 91      |
| Bahrain/Gulf Air .....                              | 2 x 767   | 146             | —                         | —                                     | —                | —                                    | 125     |
| Brazil/Varig .....                                  | 2 x MD-11   | 210             | —                         | —                                     | —                | —                                    | 173     |
| Canada/Air Canada .....                             | 1 x 767   | 76              | —                         | —                                     | —                | —                                    | 58      |
| China/China Eastern<br>Airlines .....               | 1 x MD-11   | 113             | —                         | —                                     | —                | —                                    | 95      |
| China/Shanghai Airlines ..                          | 2 x 757   | 232             | —                         | —                                     | —                | —                                    | 197     |
| China/Air China .....                               | 2 x 737   | 64              | —                         | —                                     | —                | —                                    | 51      |
| China/Xiamen Airlines .....                         | 2 x 757   | 105             | —                         | —                                     | —                | —                                    | 89      |
| Hungary/Malev Hungarian<br>Airlines .....           | 2 x 767   | 148             | —                         | —                                     | —                | —                                    | 126     |
| Indonesia/Ministry of<br>Finance of Indonesia ...   | 7 x 737,<br>2 x 747                                   | 618             | —                         | —                                     | —                | —                                    | 527     |
| Israel/El Al-Israel Airlines ..                     | 2 x 747   | 321             | —                         | —                                     | —                | —                                    | 274     |
| Italy/Alitalia-Linee Aeree<br>Italiane .....        | 4 x MD-80,<br>1 x MD-11                               | 227             | —                         | —                                     | —                | —                                    | 191     |
| Luxembourg/Luxair .....                             | 2 x 737   | 58              | —                         | —                                     | —                | —                                    | 49      |
| Luxembourg/Cargolux<br>Airlines International S.A.  | 2 x 747   | 278             | —                         | —                                     | —                | —                                    | 238     |
| Malaysia/Malaysian Airline<br>System .....          | 13 x 737,<br>1 x 747                                  | 541             | —                         | —                                     | —                | —                                    | 455     |
| Malta/Air Malta .....                               | 1 x 737   | 33              | —                         | —                                     | —                | —                                    | 29      |
| Nauru/Victoria Aircraft<br>Leasing Corporation .... | 2 x 737   | 78              | —                         | —                                     | —                | —                                    | 67      |
| Norway/Braathens S.A.F.E.                           | 2 x 737   | 54              | —                         | —                                     | —                | —                                    | 46      |
| Romania/TAROM-Romanian<br>Air Transport .....       | 2 x 737   | 57              | —                         | —                                     | —                | —                                    | 49      |
| South Africa/Transnet, Ltd.                         | 2 x 747   | 222             | —                         | —                                     | —                | —                                    | 189     |
| Thailand/Thai Airways ...                           | 1 x 747   | 135             | —                         | —                                     | —                | —                                    | 115     |
| Tunisia/Société Tunisienne<br>de L'Air .....        | 1 x 737   | 29              | —                         | —                                     | —                | —                                    | 24      |

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.

a Amount of loan as percent of export value.

b Number of payments and frequency (S=semi-annual).

# Employment

In 1994, the aerospace industry's employment level continued its downward slide under the pressure of a dual recession, wherein the industry's two main business segments—defense production and commercial aircraft manufacture—were simultaneously depressed.

On an annual average employment basis, the aerospace labor force was reduced by almost 12 percent to a level of 852,000. The drop marked the fifth straight decline since the industry attained its all-time peak employment level in 1989; the cumulative manpower loss over those five years represented

more than 35 percent of the peak total.

The 1994 employment figure amounted to 4.7 percent of the total employment in all U.S. manufacturing industries; that compared with 5.4 percent in the previous year and 6.8 percent in the aerospace peak year 1989. Aerospace employment in 1994 also represented 8.3 percent of total employment by U.S. companies producing durable goods; the comparable figures were 9.5 percent in 1993 and 11.5 percent in 1989.

The industry segment engaged in manufacture of aircraft, engines, and parts, which is the largest segment in terms of employment, once again experienced the greatest loss of jobs. In that segment, annual average employment was 480,000, down 11 percent from 542,000 in 1993. Proportionately, however, the industry segment producing missile and space systems suffered a larger loss, almost 13 percent; the labor force in that segment fell from 124,000 in 1993 to 108,000 in 1994. Employment in all other (aerospace-related) manufacturing dipped from 300,000 to 265,000, a drop of 11.7 percent.

The total aerospace payroll for 1994 was \$28.3 bil-





lion, down from the previous year's \$30.5 billion; both figures include lump-sum payments made by many aerospace companies in lieu of general wage increases or cost-of-living increases.

Payments to individual aerospace workers, however, continued to rise. Average weekly earnings, again including lump-sum payments plus overtime premiums, came to \$755, up from \$725 in 1993. Average hourly earnings amounted to \$17.97, up from \$17.44.

The Pacific region again dominated a geographic breakdown of aerospace employment in 1994. The Pacific region led with 42.9 percent of the total, followed by the West North Central (9.8 percent); South Central (9.6 percent); South Atlantic (9.3 percent); East North Central (8.7 percent); New England (8.4 percent); Mountain (7.7 percent), and Middle Atlantic (3.6 percent) regions.

The Pacific region also led in

most product group breakdowns of employment. In the civil aircraft sector, employment at Pacific-based companies constituted 53.8 percent of the total while companies in the East North Central region represented 15.6 percent and the South Central states accounted for 13.5 percent.

In military aircraft production, however, the West North Central states placed first with 19.8 percent of total employment, followed by those in the Pacific (18.3 percent) and New England (17.5 percent) regions.

The Pacific region had the largest share of workers engaged in missile and space system manufacture. The breakdown was: Missiles—Pacific (46.3 percent), Mountain (27.5 percent), and South Atlantic and South Central combined (15.2 percent); Space—Pacific (53.5 percent), South Atlantic (21.6 percent), and Mountain (14.3 percent).

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

Calendar Years 1979–1994  
(Thousands of Employees)

| Year | All Manu-<br>facturing<br>Industries | Durable<br>Goods<br>Industries | Aerospace Industry <sup>a</sup> |                        |                  |
|------|--------------------------------------|--------------------------------|---------------------------------|------------------------|------------------|
|      |                                      |                                | TOTAL                           | As Percent of          |                  |
|      |                                      |                                |                                 | All Manufac-<br>turing | Durable<br>Goods |
| 1979 | 21,040                               | 12,730                         | 1,007                           | 4.8%                   | 7.9%             |
| 1980 | 20,285                               | 12,159                         | 1,080                           | 5.3                    | 8.9              |
| 1981 | 20,170                               | 12,082                         | 1,087                           | 5.4                    | 9.0              |
| 1982 | 18,780                               | 11,014                         | 1,038                           | 5.5                    | 9.4              |
| 1983 | 18,432                               | 10,707                         | 1,019                           | 5.5                    | 9.5              |
| 1984 | 19,372                               | 11,476                         | 1,058                           | 5.5                    | 9.2              |
| 1985 | 19,248                               | 11,458                         | 1,151                           | 6.0                    | 10.1             |
| 1986 | 18,947                               | 11,195                         | 1,241                           | 6.6                    | 11.1             |
| 1987 | 18,999                               | 11,154                         | 1,282                           | 6.8                    | 11.5             |
| 1988 | 19,314                               | 11,363                         | 1,294                           | 6.7                    | 11.4             |
| 1989 | 19,391                               | 11,394                         | 1,314                           | 6.8                    | 11.5             |
| 1990 | 19,076                               | 11,109                         | 1,302                           | 6.8                    | 11.7             |
| 1991 | 18,406                               | 10,569                         | 1,214                           | 6.6                    | 11.5             |
| 1992 | 18,104                               | 10,277                         | 1,100                           | 6.1                    | 10.7             |
| 1993 | 18,003                               | 10,172                         | 966                             | 5.4                    | 9.5              |
| 1994 | 18,063                               | 10,267                         | 852                             | 4.7                    | 8.3              |

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

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

## ANNUAL PAYROLL AEROSPACE INDUSTRY AND ALL MANUFACTURING INDUSTRIES

Calendar Years 1979–1994  
(Millions of Dollars)

| Year              | All<br>Manufacturing<br>Industries <sup>d</sup> | Aerospace Industry <sup>b</sup> |                       |                     | Aerospace<br>As Percent<br>of All<br>Manufacturing |
|-------------------|---|---------------------------------|-----------------------|---------------------|--|
|                   |   | TOTAL                           | Production<br>Workers | Other<br>Workers    |  |
| 1979              | \$334,800                                       | \$15,150                        | \$ 6,465              | \$ 8,685            | 4.5%   |
| 1980              | 355,600   | 18,026                          | 7,658                 | 10,368              | 5.1  |
| 1981              | 386,700   | 19,906                          | 8,152                 | 11,754              | 5.1  |
| 1982              | 384,000   | 20,750                          | 8,043                 | 12,707              | 5.4  |
| 1983              | 397,400   | 21,644                          | 8,071                 | 13,573              | 5.4  |
| 1984              | 439,100   | 23,773                          | 8,746                 | 15,027              | 5.4  |
| 1985              | 460,900   | 26,749                          | 9,837                 | 16,911              | 5.8  |
| 1986              | 473,200   | 29,547                          | 11,038                | 18,509              | 6.2  |
| 1987              | 490,300   | 31,101                          | 11,700                | 19,401              | 6.3  |
| 1988              | 524,000   | 32,566                          | 11,744                | 20,822              | 6.2  |
| 1989              | 541,800   | 34,154                          | 12,440                | 21,714              | 6.3  |
| 1990              | 556,100   | 35,590                          | 13,020                | 22,570              | 6.4  |
| 1991              | 556,900   | 34,520                          | 12,536                | 21,984              | 6.2  |
| 1992              | 577,600   | 33,123 <sup>r</sup>             | 11,812 <sup>r</sup>   | 21,311 <sup>r</sup> | 5.7  |
| 1993 <sup>r</sup> | 588,400   | 30,391                          | 10,673                | 19,718              | 5.2  |
| 1994              | 617,500   | 28,317                          | 9,859                 | 18,458              | 4.6  |

### AEROSPACE — INCLUDING LUMP-SUM PAYMENTS<sup>c</sup>

| Year              | TOTAL               | Production<br>Workers | Other<br>Workers    | Aerospace<br>As Percent<br>of All<br>Manufacturing |
|-------------------|---------------------|-----------------------|---------------------|--|
| 1984              | \$ 23,813           | \$ 8,786              | \$15,027            | 5.4%   |
| 1985              | 26,782              | 9,871                 | 16,911              | 5.8  |
| 1986              | 29,611              | 11,102                | 18,509              | 6.3  |
| 1987              | 31,262              | 11,862                | 19,401              | 6.4  |
| 1988              | 32,757              | 11,935                | 20,822              | 6.3  |
| 1989              | 34,396              | 12,682                | 21,714              | 6.3  |
| 1990              | 35,862              | 13,292                | 22,570              | 6.4  |
| 1991              | 34,688              | 12,704                | 21,984              | 6.2  |
| 1992              | 33,258 <sup>r</sup> | 11,947 <sup>r</sup>   | 21,311 <sup>r</sup> | 5.8  |
| 1993 <sup>r</sup> | 30,548              | 10,830                | 19,718              | 5.2  |
| 1994              | 28,330              | 9,872                 | 18,458              | 4.6  |

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

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

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

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

r Revised.



**EMPLOYMENT IN THE AEROSPACE INDUSTRY<sup>a</sup>**

Calendar Years 1980–1994  
(Annual Average, Thousands of Employees)

| Year                      | TOTAL | Aircraft,<br>Engines, &<br>Parts<br>(SIC 372) | Missiles<br>& Space<br>Vehicles<br>(SIC 376) | Other <sup>b</sup> |
|---------------------------|-------|---|--|--------------------|
| <b>TOTAL EMPLOYMENT</b>   |       |   |  |                    |
| 1980                      | 1,080 | 633   | 111  | 336                |
| 1981                      | 1,087 | 626   | 123  | 338                |
| 1982                      | 1,038 | 584   | 131  | 323                |
| 1983                      | 1,019 | 562   | 141  | 317                |
| 1984                      | 1,058 | 575   | 154  | 329                |
| 1985                      | 1,151 | 616   | 177  | 358                |
| 1986                      | 1,241 | 656   | 200  | 386                |
| 1987                      | 1,282 | 678   | 206  | 399                |
| 1988                      | 1,294 | 684   | 208  | 402                |
| 1989                      | 1,314 | 711   | 194  | 408                |
| 1990                      | 1,302 | 712   | 185  | 405                |
| 1991                      | 1,214 | 669   | 168  | 378                |
| 1992                      | 1,100 | 612   | 146  | 342                |
| 1993                      | 966   | 542   | 124  | 300                |
| 1994                      | 852   | 480   | 108  | 265                |
| <b>PRODUCTION WORKERS</b> |       |   |  |                    |
| 1980                      | 406   | 344   | 35   | 27                 |
| 1981                      | 396   | 333   | 37   | 26                 |
| 1982                      | 360   | 296   | 40   | 24                 |
| 1983                      | 342   | 274   | 46   | 23                 |
| 1984                      | 351   | 276   | 52   | 23                 |
| 1985                      | 382   | 295   | 62   | 25                 |
| 1986                      | 417   | 323   | 67   | 28                 |
| 1987                      | 434   | 339   | 67   | 29                 |
| 1988                      | 422   | 331   | 63   | 28                 |
| 1989                      | 432   | 344   | 60   | 29                 |
| 1990                      | 430   | 345   | 57   | 29                 |
| 1991                      | 399   | 324   | 48   | 27                 |
| 1992                      | 355   | 291   | 40   | 24                 |
| 1993                      | 308   | 252   | 35   | 20                 |
| 1994                      | 269   | 221   | 31   | 18                 |

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

<sup>a</sup> See Glossary for detailed explanation of "Aerospace Employment."

<sup>b</sup> Communications, navigation, flight control, and displays (aerospace-related portions of SICs 366, 381, & 382).

**EMPLOYMENT IN THE AIRCRAFT, ENGINES, AND PARTS INDUSTRY<sup>a</sup>**

Calendar Years 1980–1994  
(Annual Average, Thousands of Employees)

| Year                      | TOTAL<br>(SIC 372) | Airframes<br>(SIC 3721) | Engines<br>and Parts<br>(SIC 3724) | Other Parts<br>& Equipment<br>(SIC 3728) |
|---------------------------|--------------------|-------------------------|------------------------------------|--|
| <b>TOTAL EMPLOYMENT</b>   |                    |                         |                                    |  |
| 1980                      | 633.1              | 349.3                   | 162.9                              | 120.9                                    |
| 1981                      | 626.4              | 344.2                   | 162.5                              | 119.8                                    |
| 1982                      | 584.0              | 319.9                   | 148.8                              | 115.3                                    |
| 1983                      | 561.6              | 304.7                   | 140.1                              | 116.9                                    |
| 1984                      | 574.9              | 306.1                   | 140.2                              | 128.7                                    |
| 1985                      | 616.2              | 325.6                   | 147.5                              | 143.2                                    |
| 1986                      | 655.8              | 338.9                   | 153.6                              | 163.2                                    |
| 1987                      | 678.0              | 356.4                   | 158.2                              | 163.4                                    |
| 1988                      | 683.5              | 368.5                   | 155.8                              | 159.3                                    |
| 1989                      | 711.0              | 382.2                   | 153.5                              | 175.2                                    |
| 1990                      | 712.3              | 381.0                   | 151.7                              | 179.5                                    |
| 1991                      | 669.2              | 355.6                   | 143.2                              | 170.3                                    |
| 1992                      | 611.7              | 332.1                   | 126.6                              | 153.0                                    |
| 1993 <sup>r</sup>         | 542.0              | 301.4                   | 109.2                              | 131.4                                    |
| 1994                      | 479.5              | 271.1                   | 93.6                               | 114.7                                    |
| <b>PRODUCTION WORKERS</b> |                    |                         |                                    |  |
| 1980                      | 343.9              | 173.7                   | 93.0                               | 77.4                                     |
| 1981                      | 332.7              | 167.0                   | 92.4                               | 73.5                                     |
| 1982                      | 296.2              | 144.7                   | 84.2                               | 67.3                                     |
| 1983                      | 273.9              | 131.5                   | 74.7                               | 67.1                                     |
| 1984                      | 276.0              | 128.2                   | 73.0                               | 73.3                                     |
| 1985                      | 294.6              | 135.5                   | 74.8                               | 82.2                                     |
| 1986                      | 322.5              | 146.6                   | 78.7                               | 94.3                                     |
| 1987                      | 338.5              | 159.1                   | 80.5                               | 96.3                                     |
| 1988                      | 331.3              | 162.1                   | 77.1                               | 92.1                                     |
| 1989                      | 343.7              | 167.4                   | 76.8                               | 99.5                                     |
| 1990                      | 344.6              | 164.1                   | 77.2                               | 103.2                                    |
| 1991                      | 323.6              | 151.6                   | 73.1                               | 98.8                                     |
| 1992                      | 291.4              | 137.8                   | 64.3                               | 89.2                                     |
| 1993 <sup>r</sup>         | 252.5              | 122.7                   | 53.6                               | 76.2                                     |
| 1994                      | 220.9              | 108.0                   | 46.2                               | 66.7                                     |

Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly).

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

r Revised.

## AEROSPACE INDUSTRY EMPLOYMENT<sup>a</sup> BY OCCUPATIONAL CLASSIFICATION

As of December<sup>b</sup> 1982–1995  
(Thousands of Employees)

| Year              | TOTAL | Production<br>Workers | Scientists<br>& Engineers | Technicians | Others |
|-------------------|-------|-----------------------|---------------------------|-------------|--------|
| 1982              | 765   | 353                   | 134                       | 54          | 224    |
| 1983              | 765   | 344                   | 135                       | 55          | 231    |
| 1984              | 817   | 365                   | 147                       | 60          | 245    |
| 1985              | 898   | 405                   | 163                       | 66          | 264    |
| 1986              | 948   | 436                   | 168                       | 67          | 277    |
| 1987              | 968   | 436                   | 175                       | 69          | 288    |
| 1988              | 977   | 431                   | 184                       | 66          | 296    |
| 1989              | 992   | 439                   | 198                       | 68          | 287    |
| 1990              | 946   | 422                   | 205                       | 67          | 252    |
| 1991              | 879   | 386                   | 205                       | 60          | 228    |
| 1992              | 775   | 335                   | 165                       | 57          | 218    |
| 1993              | 676   | 286                   | 148                       | 50          | 191    |
| 1994 <sup>p</sup> | 616   | 262                   | 136                       | 46          | 172    |
| 1995 <sup>e</sup> | 575   | 247                   | NA                        | 44          | NA     |

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

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

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

e Estimate.

NA Not available.

p Preliminary.

**TOTAL EMPLOYMENT AND SCIENTISTS & ENGINEERS  
IN COMMERCIAL TRANSPORT AIRCRAFT  
& HELICOPTER MANUFACTURING ESTABLISHMENTS<sup>a</sup>**

As of December 1982-1995

| Year              | Commercial Transport Aircraft |                        | Helicopters |                        |
|-------------------|-------------------------------|------------------------|-------------|------------------------|
|                   | Total                         | Scientists & Engineers | Total       | Scientists & Engineers |
| 1982              | 61,800                        | 10,200                 | 26,500      | 3,100                  |
| 1983              | 46,100                        | 8,100                  | 27,600      | 3,500                  |
| 1984              | 54,800                        | 8,900                  | 31,300      | 3,800                  |
| 1985              | 65,000                        | 10,500                 | 37,900      | 5,000                  |
| 1986              | 75,300                        | 12,500                 | 37,400      | 4,000                  |
| 1987              | 87,400                        | 14,700                 | 39,000      | 4,300                  |
| 1988              | 98,800                        | 16,200                 | 36,600      | 4,200                  |
| 1989              | 120,100                       | 15,100                 | 34,200      | 4,900                  |
| 1990              | 122,400                       | 16,700                 | 30,600      | 4,500                  |
| 1991              | 124,200                       | 16,100                 | 30,100      | 4,400                  |
| 1992              | 111,600                       | 14,800                 | 28,200      | 4,400                  |
| 1993              | 86,000                        | 14,100                 | 28,100      | 4,700                  |
| 1994 <sup>p</sup> | 81,200                        | 14,200                 | 26,900      | 4,600                  |
| 1995 <sup>E</sup> | 75,800                        | NA                     | 24,200      | 4,000                  |

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

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

E Estimate.

NA Not available.

p Preliminary.

**GEOGRAPHIC DISTRIBUTION OF AEROSPACE EMPLOYMENT  
BY OCCUPATIONAL CLASSIFICATION AND PRODUCT GROUP**

As of December 1994

| PERCENT DISTRIBUTION BY OCCUPATION |        |                    |                        |             |            |
|------------------------------------|--------|--------------------|------------------------|-------------|------------|
| Region                             | TOTAL  | Production Workers | Scientists & Engineers | Technicians | All Others |
| <b>TOTAL</b> .....                 | 100.0% | 100.0%             | 100.0%                 | 100.0%      | 100.0%     |
| New England .....                  | 8.4%   | 11.4%              | 6.4%                   | 4.7%        | 7.9%       |
| Middle Atlantic .....              | 3.6    | 3.1                | 4.2                    | 1.9         | 4.0        |
| East North Central .....           | 8.7    | 14.8               | 6.6                    | 5.7         | 4.9        |
| West North Central .....           | 9.8    | 11.5               | 10.9                   | 14.6        | 5.8        |
| South Atlantic .....               | 9.3    | 6.5                | 9.8                    | 10.6        | 11.6       |
| South Central .....                | 9.6    | 11.2               | 7.8                    | 6.8         | 10.0       |
| Mountain .....                     | 7.7    | 5.4                | 8.9                    | 7.3         | 9.3        |
| Pacific .....                      | 42.9   | 36.1               | 45.5                   | 48.4        | 46.4       |

| PERCENT DISTRIBUTION BY PRODUCT GROUP |        |          |          |          |        |        |          |
|---------------------------------------|--------|----------|----------|----------|--------|--------|----------|
| Region <sup>a</sup>                   | Total  | Aircraft |          | Missiles | Space  | Other  |          |
|                                       |        | Civil    | Military |          |        | Aero   | Non-Aero |
| <b>TOTAL</b> .....                    | 100.0% | 100.0%   | 100.0%   | 100.0%   | 100.0% | 100.0% | 100.0%   |
| New England .....                     | 8.4%   | 9.4%     | 17.5%    | 3.1%     | 1.2%   | 1.2%   | 5.3%     |
| Middle Atlantic .....                 | 3.6    |          | 5.2      |          |        | 10.6   |          |
| East North Central ..                 | 8.7    | 15.6     | 9.4      | 8.0      | 1.0    | 20.9   | 7.6      |
| West North Central ..                 | 9.8    | 1.6      | 19.8     |          |        |        |          |
| South Atlantic .....                  | 9.3    | 1.3      | 14.3     | 15.2     | 21.6   | 4.5    | 27.4     |
| South Central .....                   | 9.6    | 13.5     | 12.2     |          | 8.3    | 4.5    |          |
| Mountain .....                        | 7.7    | 4.8      | 3.2      | 27.5     | 14.3   | 7.4    | 59.7     |
| Pacific .....                         | 42.9   | 53.8     | 18.3     | 46.3     | 53.5   | 50.9   |          |

Source: Aerospace Industries Association, company reports.

NOTE: Employment in 26 surveyed aerospace manufacturing corporations accounted for approximately three-fifths of total industry employment.

a Data for two regions are combined where employment for one region within a product group represented three or fewer companies.

## AVERAGE HOURLY EARNINGS IN THE AEROSPACE INDUSTRY

Production Workers Only  
Calendar Years 1975–1994

| Year  | TOTAL <sup>a</sup> | Aircraft (SIC 372) |                      |                            | Guided Missiles, Space Vehicles & Parts (SIC 376) | Complete Guided Missiles, & Space Vehicles (SIC 3761) |                                    |
|---|--------------------|--------------------|----------------------|----------------------------|---|---|------------------------------------|
|   |                    | TOTAL <sup>a</sup> | Airframes (SIC 3721) | Engines & Parts (SIC 3724) |   |   | Other Parts & Equipment (SIC 3728) |
| <b>AVERAGE HOURLY EARNINGS<sup>b</sup></b>                                  |                    |                    |                      |                            |   |   |                                    |
| 1975  | \$ 6.00            | \$ 6.00            | \$ 6.21              | \$ 6.04                    | \$ 5.47   | \$ 6.02   | \$ 5.99                            |
| 1976  | 6.44               | 6.44               | 6.63                 | 6.46                       | 5.95  | 6.48  | 6.49                               |
| 1977  | 6.93               | 6.92               | 7.07                 | 7.05                       | 6.44  | 7.04  | 7.15                               |
| 1978  | 7.54               | 7.54               | 7.70                 | 7.80                       | 6.93  | 7.56  | 7.72                               |
| 1979  | 8.26               | 8.26               | 8.50                 | 8.53                       | 7.48  | 8.25  | 8.38                               |
| 1980  | 9.27               | 9.28               | 9.66                 | 9.42                       | 8.40  | 9.22  | 9.33                               |
| 1981  | 10.29              | 10.31              | 10.74                | 10.41                      | 9.35  | 10.06   | 10.34                              |
| 1982  | 11.20              | 11.23              | 11.85                | 11.16                      | 10.17   | 10.95   | 11.21                              |
| 1983  | 11.79              | 11.82              | 12.58                | 11.61                      | 10.73   | 11.59   | 11.84                              |
| 1984  | 12.24              | 12.32              | 12.91                | 12.40                      | 11.37   | 11.82   | 12.01                              |
| 1985  | 12.54              | 12.62              | 13.18                | 12.85                      | 11.66   | 12.14   | 12.36                              |
| 1986  | 12.75              | 12.86              | 13.48                | 13.08                      | 11.90   | 12.20   | 12.48                              |
| 1987  | 13.10              | 13.17              | 13.74                | 13.33                      | 12.23   | 12.73   | 13.09                              |
| 1988  | 13.48              | 13.55              | 14.18                | 13.80                      | 12.28   | 13.13   | 13.53                              |
| 1989  | 14.10              | 14.17              | 14.89                | 14.42                      | 12.81   | 13.70   | 14.20                              |
| 1990  | 14.73              | 14.79              | 15.66                | 14.84                      | 13.37   | 14.39   | 14.82                              |
| 1991  | 15.51              | 15.60              | 16.72                | 15.38                      | 14.05   | 14.90   | 15.21                              |
| 1992  | 16.46              | 16.53              | 17.70                | 16.28                      | 14.89   | 15.99   | 16.45                              |
| 1993  | 17.18 <sup>f</sup> | 17.23 <sup>f</sup> | 18.43                | 16.70                      | 15.72 <sup>f</sup>                                | 16.80   | 17.43                              |
| 1994  | 17.90              | 17.96              | 19.50                | 17.31                      | 16.03   | 17.48   | 18.39                              |
| <b>AVERAGE HOURLY EARNINGS INCLUDING LUMP-SUM WAGE PAYMENTS<sup>c</sup></b> |                    |                    |                      |                            |   |   |                                    |
| 1984  | \$12.37            | \$12.46            | \$13.11              | \$12.40                    | \$11.37   | \$11.92   | \$12.14                            |
| 1985  | 12.69              | 12.77              | 13.40                | 12.85                      | 11.66   | 12.29   | 12.56                              |
| 1986  | 12.94              | 13.06              | 13.80                | 13.08                      | 11.90   | 12.33   | 12.66                              |
| 1987  | 13.37              | 13.48              | 14.32                | 13.33                      | 12.23   | 12.80   | 13.19                              |
| 1988  | 13.73              | 13.79              | 14.65                | 13.80                      | 12.28   | 13.36   | 13.87                              |
| 1989  | 14.37              | 14.44              | 15.41                | 14.42                      | 12.81   | 13.98   | 14.63                              |
| 1990  | 15.04              | 15.10              | 16.32                | 14.84                      | 13.37   | 14.67   | 15.26                              |
| 1991  | 15.71              | 15.81              | 17.16                | 15.38                      | 14.05   | 15.09   | 15.49                              |
| 1992  | 16.67              | 16.75              | 18.18                | 16.28                      | 14.89   | 16.05   | 16.54                              |
| 1993  | 17.44              | 17.52 <sup>f</sup> | 19.00                | 16.70                      | 15.72 <sup>f</sup>                                | 16.83   | 17.47                              |
| 1994  | 17.97              | 18.03              | 19.57                | 17.31                      | 16.03   | 17.53   | 18.37                              |

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

<sup>a</sup> TOTAL columns are employment-based weighted averages.

<sup>b</sup> Includes overtime premiums.

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

<sup>f</sup> Revised.

**AVERAGE WEEKLY EARNINGS IN THE AEROSPACE INDUSTRY**

**Production Workers Only  
Calendar Years 1979–1994**

| Year | TOTAL <sup>a</sup> | Aircraft (SIC 372) |                      |                            | Guided Missiles, Space Vehicles & Parts (SIC 376) | Complete Guided Missiles, & Space Vehicles (SIC 3761) |
|------|--------------------|--------------------|----------------------|----------------------------|---|---|
|      |                    | TOTAL <sup>a</sup> | Airframes (SIC 3721) | Engines & Parts (SIC 3724) |   |   |

**AVERAGE WEEKLY EARNINGS<sup>b</sup>**

|      |                  |       |       |       |                  |       |       |
|------|------------------|-------|-------|-------|------------------|-------|-------|
| 1979 | \$351            | \$351 | \$360 | \$361 | \$322            | \$347 | \$348 |
| 1980 | 389              | 390   | 404   | 394   | 358              | 378   | 383   |
| 1981 | 424              | 426   | 444   | 422   | 396              | 410   | 420   |
| 1982 | 460              | 462   | 485   | 454   | 426              | 447   | 461   |
| 1983 | 486              | 487   | 513   | 476   | 453              | 480   | 494   |
| 1984 | 513              | 516   | 532   | 523   | 486              | 496   | 508   |
| 1985 | 531              | 534   | 547   | 542   | 506              | 515   | 527   |
| 1986 | 545              | 550   | 568   | 561   | 520              | 517   | 533   |
| 1987 | 556              | 558   | 578   | 567   | 523              | 541   | 556   |
| 1988 | 573              | 575   | 596   | 582   | 529              | 567   | 585   |
| 1989 | 593              | 594   | 616   | 616   | 542              | 589   | 611   |
| 1990 | 624              | 626   | 656   | 637   | 570              | 612   | 634   |
| 1991 | 648              | 651   | 694   | 654   | 583              | 632   | 649   |
| 1992 | 685              | 689   | 736   | 689   | 615              | 652   | 666   |
| 1993 | 714 <sup>r</sup> | 717   | 756   | 715   | 657 <sup>r</sup> | 696   | 727   |
| 1994 | 754              | 756   | 798   | 753   | 689              | 738   | 779   |

**AVERAGE WEEKLY EARNINGS INCLUDING LUMP-SUM PAYMENTS<sup>c</sup>**

|      |       |       |       |       |                  |       |       |
|------|-------|-------|-------|-------|------------------|-------|-------|
| 1984 | \$515 | \$518 | \$540 | \$523 | \$486            | \$501 | \$514 |
| 1985 | 532   | 535   | 556   | 542   | 506              | 521   | 535   |
| 1986 | 548   | 553   | 581   | 561   | 520              | 523   | 541   |
| 1987 | 563   | 567   | 603   | 567   | 523              | 544   | 561   |
| 1988 | 583   | 584   | 615   | 582   | 529              | 577   | 599   |
| 1989 | 605   | 605   | 638   | 616   | 542              | 601   | 629   |
| 1990 | 637   | 639   | 684   | 637   | 570              | 624   | 653   |
| 1991 | 657   | 659   | 712   | 654   | 583              | 640   | 661   |
| 1992 | 693   | 698   | 756   | 689   | 615              | 655   | 670   |
| 1993 | 725   | 729   | 779   | 715   | 657 <sup>r</sup> | 697   | 728   |
| 1994 | 755   | 757   | 800   | 753   | 689              | 740   | 783   |

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

a TOTAL columns are employment-based weighted averages.

b Includes overtime premiums.

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

r Revised.

## AVERAGE HOURS IN THE AEROSPACE INDUSTRY

Production Workers Only  
Calendar Years 1980–1994

| Year                        | TOTAL <sup>a</sup> | Aircraft (SIC 372) |                      |                            | Guided Missiles, Space Vehicles & Parts (SIC 376) | Complete Guided Missiles, & Space Vehicles (SIC 3761) |                                    |
|-----------------------------|--------------------|--------------------|----------------------|----------------------------|---|---|------------------------------------|
|                             |                    | TOTAL <sup>a</sup> | Airframes (SIC 3721) | Engines & Parts (SIC 3724) |   |   | Other Parts & Equipment (SIC 3728) |
| <b>AVERAGE WEEKLY HOURS</b> |                    |                    |                      |                            |   |   |                                    |
| 1980                        | 41.9               | 42.0               | 41.8                 | 41.8                       | 42.6  | 41.0  | 41.1                               |
| 1981                        | 41.3               | 41.3               | 41.3                 | 40.5                       | 42.4  | 40.8  | 40.6                               |
| 1982                        | 41.1               | 41.1               | 40.9                 | 40.7                       | 41.9  | 40.8  | 41.1                               |
| 1983                        | 41.2               | 41.2               | 40.8                 | 41.0                       | 42.2  | 41.4  | 41.7                               |
| 1984                        | 41.9               | 41.9               | 41.2                 | 42.2                       | 42.7  | 42.0  | 42.3                               |
| 1985                        | 42.3               | 42.3               | 41.5                 | 42.2                       | 43.4  | 42.4  | 42.6                               |
| 1986                        | 42.7               | 42.8               | 42.1                 | 42.9                       | 43.7  | 42.4  | 42.7                               |
| 1987                        | 42.4               | 42.4               | 42.1                 | 42.5                       | 42.8  | 42.5  | 42.5                               |
| 1988                        | 42.5               | 42.4               | 42.0                 | 42.2                       | 43.1  | 43.2  | 43.2                               |
| 1989                        | 42.1               | 41.9               | 41.4                 | 42.7                       | 42.3  | 43.0  | 43.0                               |
| 1990                        | 42.3               | 42.3               | 41.9                 | 42.9                       | 42.6  | 42.5  | 42.8                               |
| 1991                        | 41.8               | 41.7               | 41.5                 | 42.5                       | 41.5  | 42.4  | 42.7                               |
| 1992                        | 41.6               | 41.7               | 41.6                 | 42.3                       | 41.3  | 40.8  | 40.5                               |
| 1993                        | 41.6               | 41.6               | 41.0                 | 42.8                       | 41.8  | 41.4  | 41.7                               |
| 1994                        | 42.1               | 42.1               | 40.9                 | 43.5                       | 43.0  | 42.2  | 42.6                               |

### AVERAGE WEEKLY OVERTIME HOURS

|      |     |     |     |     |     |     |     |
|------|-----|-----|-----|-----|-----|-----|-----|
| 1980 | 4.1 | 4.2 | 3.5 | 5.0 | 5.0 | 3.6 | 3.2 |
| 1981 | 3.5 | 3.5 | 3.1 | 3.5 | 4.4 | 3.2 | 2.9 |
| 1982 | 3.2 | 3.2 | 2.7 | 3.6 | 3.7 | 3.1 | 3.1 |
| 1983 | 3.1 | 3.1 | 2.5 | 3.7 | 3.7 | 3.3 | 3.5 |
| 1984 | 3.9 | 4.0 | 3.0 | 5.1 | 4.6 | 3.3 | 3.4 |
| 1985 | 4.6 | 4.6 | 3.5 | 5.4 | 5.3 | 4.6 | 5.0 |
| 1986 | 4.8 | 4.9 | 4.2 | 5.5 | 5.5 | 4.4 | 4.7 |
| 1987 | 4.8 | 4.9 | 4.4 | 5.0 | 5.4 | 4.2 | 4.3 |
| 1988 | 4.6 | 4.6 | 4.3 | 4.6 | 5.1 | 4.5 | 4.6 |
| 1989 | 5.0 | 5.1 | 5.0 | 5.4 | 5.0 | 4.4 | 4.5 |
| 1990 | 4.5 | 4.6 | 4.3 | 5.3 | 4.5 | 3.8 | 4.1 |
| 1991 | 4.0 | 4.0 | 4.1 | 4.5 | 3.5 | 3.9 | 4.5 |
| 1992 | 3.6 | 3.7 | 3.6 | 4.4 | 3.3 | 2.8 | 3.1 |
| 1993 | 3.8 | 3.9 | 3.7 | 4.6 | 3.7 | 2.9 | 3.2 |
| 1994 | 4.5 | 4.6 | 4.1 | 5.3 | 4.8 | 3.7 | 3.8 |

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



## EMPLOYMENT IN NATIONAL AERONAUTICS AND SPACE ADMINISTRATION PROGRAMS

End of Fiscal Years 1961–1996

| Year              | TOTAL   | NASA<br>Employees | Contractor<br>Employees <sup>a</sup> |
|-------------------|---------|-------------------|--------------------------------------|
| 1961              | 74,577  | 17,077            | 57,500                               |
| 1962              | 137,656 | 22,156            | 115,500                              |
| 1963              | 246,304 | 27,904            | 218,400                              |
| 1964              | 379,084 | 31,984            | 347,100                              |
| 1965              | 409,900 | 33,200            | 376,700                              |
| 1966              | 393,924 | 33,924            | 360,000                              |
| 1967              | 306,926 | 33,726            | 273,200                              |
| 1968              | 267,871 | 32,471            | 235,400                              |
| 1969              | 218,345 | 31,745            | 186,600                              |
| 1970              | 160,850 | 31,350            | 129,500                              |
| 1971              | 143,578 | 29,478            | 114,100                              |
| 1972              | 138,800 | 27,500            | 111,300                              |
| 1973              | 134,850 | 26,850            | 108,000                              |
| 1974              | 125,220 | 25,020            | 100,200                              |
| 1975              | 127,733 | 24,333            | 103,400                              |
| 1976              | 130,739 | 24,039            | 108,000                              |
| 1977              | 124,136 | 23,636            | 100,500                              |
| 1978              | 124,637 | 23,237            | 101,400                              |
| 1979              | 131,931 | 22,831            | 109,100                              |
| 1980              | 135,613 | 22,613            | 113,000                              |
| 1981              | 133,473 | 21,873            | 111,600                              |
| 1982              | 128,730 | 22,430            | 106,300                              |
| 1983              | 129,246 | 22,246            | 107,000                              |
| 1984              | 162,080 | 22,080            | 140,000                              |
| 1985              | 131,991 | 21,991            | 110,000                              |
| 1986              | 154,660 | 21,660            | 133,000                              |
| 1987              | 165,001 | 22,001            | 143,000                              |
| 1988              | 172,326 | 22,326            | 150,000                              |
| 1989              | 213,054 | 23,054            | 190,000                              |
| 1990              | 221,829 | 23,829            | 198,000                              |
| 1991              | 223,149 | 24,149            | 199,000                              |
| 1992              | 230,513 | 24,513            | 206,000                              |
| 1993              | 228,674 | 24,17             | 204,500                              |
| 1994              | 217,910 | 23,873            | 194,037                              |
| 1995 <sup>E</sup> | 210,075 | 23,075            | 187,000                              |
| 1996 <sup>E</sup> | 200,000 | 23,000            | 177,000                              |

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

<sup>a</sup> 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.

<sup>E</sup> Estimate.

**FEDERAL CIVILIAN EMPLOYMENT<sup>a</sup>  
IN THE DEPARTMENT OF DEFENSE**  
Fiscal Years 1967–1996

| Year              | TOTAL     | Civil<br>Functions <sup>b</sup> | Military<br>Functions <sup>c</sup> |
|-------------------|-----------|---------------------------------|------------------------------------|
| 1967              | 1,225,637 | 31,980                          | 1,193,657                          |
| 1968              | 1,288,130 | 32,062                          | 1,256,068                          |
| 1969              | 1,257,091 | 31,214                          | 1,225,877                          |
| 1970              | 1,159,935 | 30,293                          | 1,129,642                          |
| 1971              | 1,092,804 | 30,063                          | 1,062,741                          |
| 1972              | 1,040,147 | 30,585                          | 1,009,562                          |
| 1973              | 987,281   | 29,971                          | 957,310                            |
| 1974              | 1,002,850 | 29,072                          | 973,778                            |
| 1975              | 983,790   | 29,069                          | 954,721                            |
| 1976              | 951,034   | 28,648                          | 922,386                            |
| 1977              | 940,549   | 28,912                          | 911,637                            |
| 1978              | 933,071   | 28,962                          | 904,109                            |
| 1979              | 914,582   | 28,592                          | 885,990                            |
| 1980              | 907,700   | 27,700                          | 880,000                            |
| 1981              | 981,400   | 34,400                          | 947,000                            |
| 1982              | 1,009,192 | 31,111                          | 978,081                            |
| 1983              | 1,015,622 | 30,816                          | 984,806                            |
| 1984              | 1,040,213 | 28,681                          | 1,011,532                          |
| 1985              | 1,065,624 | 28,754                          | 1,036,870                          |
| 1986              | 1,069,863 | 28,511                          | 1,041,352                          |
| 1987              | 1,059,669 | 28,352                          | 1,031,317                          |
| 1988              | 1,053,000 | 28,419                          | 1,024,581                          |
| 1989              | 1,051,166 | 28,081                          | 1,023,085                          |
| 1990              | 1,048,814 | 27,651                          | 1,021,163                          |
| 1991              | 1,001,183 | 27,385                          | 973,798                            |
| 1992              | 1,000,453 | 27,584                          | 972,869                            |
| 1993              | 958,855   | 27,055                          | 931,800                            |
| 1994              | 896,293   | 28,001                          | 868,292                            |
| 1995 <sup>E</sup> | 861,805   | 27,700                          | 834,105                            |
| 1996 <sup>E</sup> | 827,980   | 27,400                          | 800,580                            |

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

a Full-time equivalent civilian employment.

b Data are estimated for portions of Civil Functions.

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

E Estimate.

**OCCUPATIONAL INJURY AND ILLNESS INCIDENCE RATES<sup>a</sup>**  
**ALL MANUFACTURING AND AEROSPACE INDUSTRIES**  
**Calendar Years 1989–1993**

|   | 1989  | 1990  | 1991  | 1992  | 1993 |
|---|-------|-------|-------|-------|------|
| <b>All Manufacturing:</b>                                     |       |       |       |       |      |
| Total Cases   | 13.1  | 13.2  | 12.7  | 12.5  | 12.1 |
| Lost Workday Cases  | 5.8   | 5.8   | 5.6   | 5.4   | 5.3  |
| Nonfatal Cases without Lost Workdays                          | 7.3   | 7.3   | 7.1   | 7.1   | 6.8  |
| Lost Workdays   | 113.0 | 120.7 | 121.5 | 124.6 | NA   |
| <b>Aircraft and Parts (SIC 372):</b>                          |       |       |       |       |      |
| Total Cases   | 10.1  | 10.4  | 10.9  | 11.1  | 10.3 |
| Lost Workday Cases  | 3.7   | 4.0   | 4.3   | 4.5   | 4.1  |
| Nonfatal Cases without Lost Workdays                          | 6.4   | 6.4   | 6.6   | 6.6   | 6.2  |
| Lost Workdays   | 70.2  | 90.3  | 114.4 | 125.4 | NA   |
| <b>Aircraft (SIC 3721):</b>                                   |       |       |       |       |      |
| Total Cases   | 10.2  | 10.0  | 10.2  | 10.7  | 10.2 |
| Lost Workday Cases  | 3.5   | 3.9   | 4.2   | 4.4   | 4.0  |
| Nonfatal Cases without Lost Workdays                          | 6.7   | 6.1   | 6.0   | 6.3   | 6.2  |
| Lost Workdays   | 70.5  | 95.3  | 128.2 | 141.8 | NA   |
| <b>Aircraft Engines and Parts (SIC 3724):</b>                 |       |       |       |       |      |
| Total Cases   | 7.9   | 9.3   | 10.0  | 9.7   | 9.7  |
| Lost Workday Cases  | 3.7   | 4.2   | 4.3   | 3.9   | 4.1  |
| Nonfatal Cases without Lost Workdays                          | 4.2   | 5.1   | 5.7   | 5.7   | 5.6  |
| Lost Workdays   | 72.5  | 89.5  | 91.3  | 85.1  | NA   |
| <b>Aircraft Parts (SIC 3728):</b>                             |       |       |       |       |      |
| Total Cases   | 12.0  | 11.9  | 12.9  | 13.1  | 11.1 |
| Lost Workday Cases  | 4.1   | 3.9   | 4.4   | 5.0   | 4.3  |
| Nonfatal Cases without Lost Workdays                          | 7.8   | 8.0   | 8.5   | 8.1   | 6.7  |
| Lost Workdays   | 67.7  | 80.5  | 105.3 | 122.3 | NA   |
| <b>Guided Missiles, Space Vehicles &amp; Parts (SIC 376):</b> |       |       |       |       |      |
| Total Cases   | 4.8   | 4.0   | 4.3   | 4.0   | 4.5  |
| Lost Workday Cases  | 2.2   | 1.9   | 2.1   | 1.8   | 1.9  |
| Nonfatal Cases without Lost Workdays                          | 2.6   | 2.1   | 2.2   | 2.3   | 2.6  |
| Lost Workdays   | 39.7  | 39.5  | 51.0  | 50.3  | NA   |
| <b>Guided Missiles &amp; Space Vehicles (SIC 3761):</b>       |       |       |       |       |      |
| Total Cases   | 4.6   | 4.0   | 4.3   | 4.0   | 4.6  |
| Lost Workday Cases  | 2.2   | 1.9   | 2.2   | 1.9   | 1.9  |
| Nonfatal Cases without Lost Workdays                          | 2.5   | 2.1   | 2.1   | 2.1   | 2.7  |
| Lost Workdays   | 41.4  | 37.3  | 54.2  | 53.0  | NA   |
| <b>Space Propulsion Units &amp; Parts (SIC 3764):</b>         |       |       |       |       |      |
| Total Cases   | 4.6   | 4.4   | 4.5   | 3.6   | NA   |
| Lost Workday Cases  | 2.1   | 2.2   | 2.0   | 1.5   | NA   |
| Nonfatal Cases without Lost Workdays                          | 2.5   | 2.2   | 2.5   | 2.2   | NA   |
| Lost Workdays   | 33.5  | 48.7  | 44.1  | 42.5  | NA   |
| <b>Other Space Vehicle Equipment (SIC 3769):</b>              |       |       |       |       |      |
| Total Cases   | 5.6   | 3.8   | 3.9   | 5.1   | 4.8  |
| Lost Workday Cases  | 2.3   | 1.6   | 1.6   | 1.8   | 1.8  |
| Nonfatal Cases without Lost Workdays                          | 3.3   | 2.3   | 2.3   | 3.3   | 3.0  |
| Lost Workdays   | 41.5  | 38.4  | 40.8  | 47.1  | NA   |

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

a Defined as the number of injuries and illnesses per 100 full-time workers. Separate incidence rates also available for occupational injuries only.

NA Not available.

**AEROSPACE INDUSTRY WORK STOPPAGES<sup>a</sup>**  
**Calendar Years 1979–1994**

| Year              | Number<br>of<br>Strikes <sup>b</sup> | Number of<br>Workers<br>Involved | Work-Days<br>Idle<br>in Year |
|-------------------|--------------------------------------|----------------------------------|------------------------------|
| 1979              | 12                                   | 6,600                            | 103,400                      |
| 1980              | 17                                   | 4,400                            | 92,900                       |
| 1981              | 12                                   | 6,100                            | 188,900                      |
| 1982 <sup>c</sup> | 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              | —                                    | —                                | —                            |

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

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

b Strikes beginning during calendar year.

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

# Finance

---

In 1994, the aerospace industry reported net income after taxes of \$5.7 billion, up from \$4.6 billion in the previous year. Technically speaking, 1994 earnings represented an all-time high, but the record was tarnished by the fact that much of the profit stemmed from the effects of downsizing occasioned by business decline.

Payroll costs, for example, were sharply lower as the industry was forced to reduce further its employment level; investment in research and development was lower because defense restructuring has reduced the opportunities for innovations leading to production contracts; and fewer production contracts caused reduction of expenditures for plant and equipment. The 1994 profit figure also reflects income from sales of assets.

Expressed as a percentage of sales, the industry's profit amounted to 4.7 percent, compared with the average for all U.S. manufacturing industries of 5.4 percent. As a percentage of assets, the aerospace figure was 4.3 percent, the all-industry average 5.8 percent. As a percentage of equity, aerospace earnings amounted to 14.8 percent, which compared with 15.6 percent for all U.S. manufacturing.

The aerospace balance sheet for 1994, as reported by the Bureau

of the Census, showed an increase in net working capital from \$14.2 billion in 1993 to \$15.7 billion in 1994. Total assets declined to \$132.3 billion from the previous year's \$132.7 billion.

McDonnell Douglas Corporation once again headed the list of Department of Defense contractors in terms of contract dollar value in Fiscal Year (FY) 1994; the company received awards totaling \$9.3 billion, which compares with \$7.5 billion in FY 1993. Lockheed Corporation and Martin Marietta Corporation were reported separately in 1994 (prior to their merger) and placed second and



---

fourth, respectively. Lockheed had defense awards totaling \$6.5 billion. In third place was Northrop Grumman Corporation (\$5.2 billion), followed by Martin Marietta (\$3.1 billion) and General Motors Corporation (\$3 billion).

Rounding out the top 10 defense contractors were General Dynamics Corporation (\$2.8 billion), Raytheon Company (\$2.7 billion), General Electric Company (\$2.7 billion), United Technologies Corporation (\$2.7 billion), and Loral Corporation (\$1.7 billion).

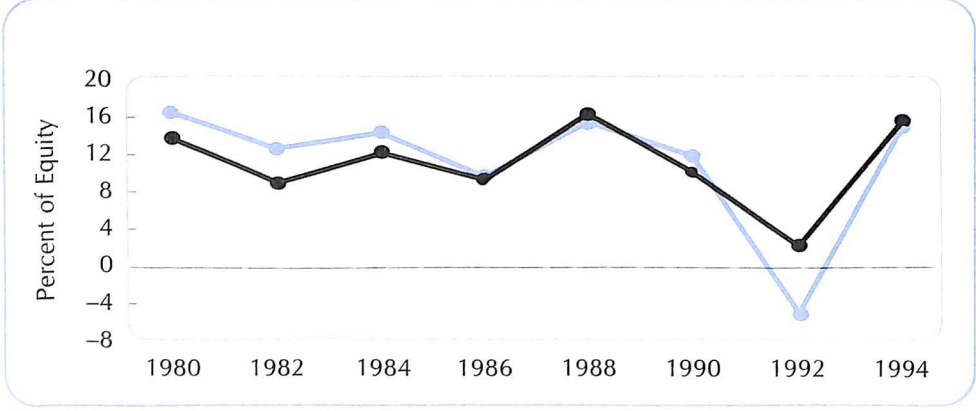
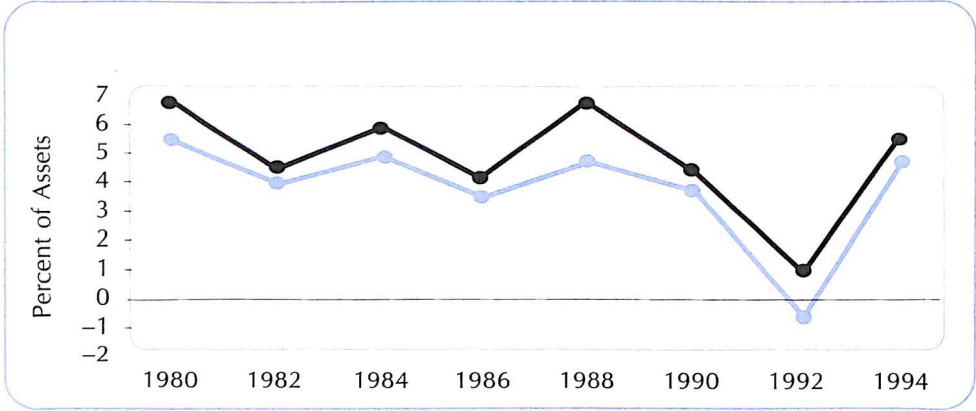
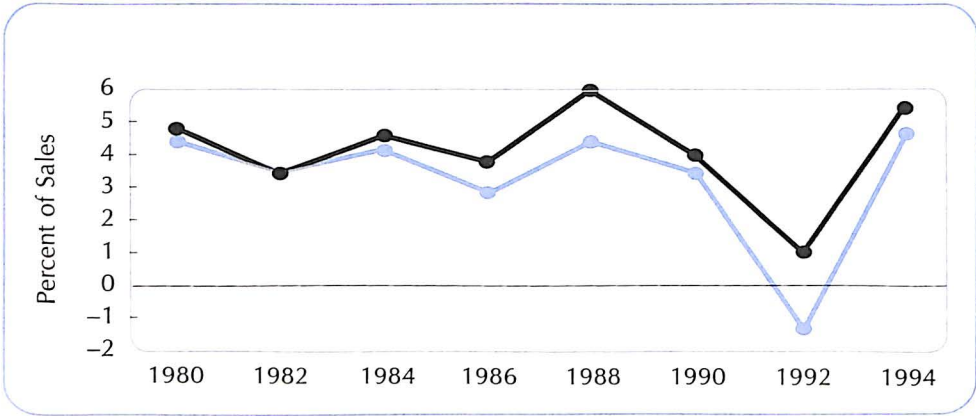
The Boeing Company edged out perennial leader Rockwell International Corporation to top the list

of National Aeronautics and Space Administration (NASA) contractors in FY 1994. Both had contract values of approximately \$1.1 billion. Lockheed Space Operations Company placed third with \$572 million, followed by McDonnell Douglas (\$565 million) and Martin Marietta (\$498 million).

The rest of NASA's top 10 included Thiokol Corporation (\$431 million), Rockwell Space Operations Inc. (\$338 million), Computer Sciences Corporation (\$255 million), AlliedSignal Technical Services (\$247 million), and TRW Inc. (\$235 million).



# Net Profit After Taxes



— ALL MANUFACTURING      — AEROSPACE INDUSTRY

SOURCE: AEROSPACE INDUSTRIES ASSOCIATION

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

Calendar Years 1980–1994

**PERCENT OF SALES**

| Year | All<br>Manufacturing<br>Corporations | Non-<br>Durable<br>Goods | Durable<br>Goods | Aerospace <sup>a</sup><br>Industry |
|------|--------------------------------------|--------------------------|------------------|------------------------------------|
| 1980 | 4.8%                                 | 5.6%                     | 4.0%             | 4.3%                               |
| 1981 | 4.7                                  | 5.1                      | 4.3              | 4.4                                |
| 1982 | 3.5                                  | 4.6                      | 2.4              | 3.3                                |
| 1983 | 4.1                                  | 4.9                      | 3.1              | 3.5                                |
| 1984 | 4.6                                  | 4.8                      | 4.4              | 4.1                                |
| 1985 | 3.8                                  | 4.1                      | 3.4              | 3.1                                |
| 1986 | 3.7                                  | 4.6                      | 2.9              | 2.8                                |
| 1987 | 4.9                                  | 5.2                      | 4.5              | 4.1                                |
| 1988 | 6.0                                  | 6.7                      | 5.2              | 4.3                                |
| 1989 | 5.0                                  | 5.8                      | 4.1              | 3.3                                |
| 1990 | 4.0                                  | 4.9                      | 3.0              | 3.4                                |
| 1991 | 2.5                                  | 4.2                      | 0.6              | 1.8 <sup>b</sup>                   |
| 1992 | 1.0                                  | 3.2                      | (1.4)            | (1.4) <sup>b</sup>                 |
| 1993 | 2.8                                  | 3.7                      | 1.9              | 3.6                                |
| 1994 | 5.4                                  | 5.5                      | 5.2              | 4.7                                |

| Year | Percent of Assets <sup>c</sup> |                                    | Percent of Equity <sup>c</sup> |                                    |
|------|--------------------------------|------------------------------------|--------------------------------|------------------------------------|
|      | All<br>Manufacturing           | Aerospace <sup>a</sup><br>Industry | All<br>Manufacturing           | Aerospace <sup>a</sup><br>Industry |
| 1980 | 6.9%                           | 5.2%                               | 13.9%                          | 16.0%                              |
| 1981 | 6.7                            | 5.2                                | 13.6                           | 16.0                               |
| 1982 | 4.5                            | 3.7                                | 9.2                            | 12.0                               |
| 1983 | 5.1                            | 4.1                                | 10.5                           | 12.1                               |
| 1984 | 6.0                            | 4.7                                | 12.5                           | 14.1                               |
| 1985 | 4.6                            | 3.6                                | 10.1                           | 11.1                               |
| 1986 | 4.2                            | 3.1                                | 9.5                            | 9.4                                |
| 1987 | 5.6                            | 4.4                                | 12.8                           | 14.6                               |
| 1988 | 6.9                            | 4.4                                | 16.2                           | 14.9                               |
| 1989 | 5.6                            | 3.3                                | 13.7                           | 10.7                               |
| 1990 | 4.3                            | 3.4                                | 10.7                           | 11.5                               |
| 1991 | 2.6                            | 1.9 <sup>b</sup>                   | 6.4                            | 6.1 <sup>b</sup>                   |
| 1992 | 1.0                            | (1.2) <sup>b</sup>                 | 2.6                            | (5.2) <sup>b</sup>                 |
| 1993 | 2.9                            | 3.5                                | 8.1                            | 13.2                               |
| 1994 | 5.8                            | 4.3                                | 15.6                           | 14.8                               |

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

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

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

c Average of four quarters

( ) Net loss after taxes.



## INCOME STATEMENT AND OPERATING RATIOS FOR AEROSPACE COMPANIES<sup>a</sup>

Calendar Years 1991–1994  
(Millions of Dollars)

| INCOME STATEMENT  | 1991             | 1992              | 1993             | 1994             |
|---|------------------|-------------------|------------------|------------------|
| Net Sales, Receipts, Operating Revenues . . . .   | \$135,175        | \$134,420         | \$128,651        | \$120,521        |
| Less: Depreciation, Depletion, & Amortization<br>of Property, Plant, and Equipment . . . . .                            | 4,353            | 4,443             | 4,474            | 4,500            |
| Less: All Other Operating Costs & Expenses,<br>Including Selling Costs & General &<br>Administrative Expenses . . . . . | 123,208          | 123,075           | 117,162          | 108,306          |
| <b>Income (or Loss) from Operations . . . . .</b>   | <b>\$ 7,614</b>  | <b>\$ 6,900</b>   | <b>\$ 7,015</b>  | <b>\$ 7,714</b>  |
| Net Non-Operating Income (Expense) . . . . .  | (3,432)          | (8,666)           | (307)            | 372              |
| <b>Income (or Loss) before Income<br/>Taxes (= Total Income) . . . . .</b>  | <b>\$ 4,181</b>  | <b>\$ (1,766)</b> | <b>\$ 6,708</b>  | <b>\$ 8,086</b>  |
| Less: Provision for Current & Deferred<br>Domestic Income Taxes . . . . .   | 1,698            | 71                | 2,086            | 2,432            |
| <b>Income (or Loss) after Income<br/>Taxes (= Net Profit) . . . . .</b>   | <b>\$ 2,484</b>  | <b>\$ (1,836)</b> | <b>\$ 4,621</b>  | <b>\$ 5,655</b>  |
| Cash Dividends Charged to Retained<br>Earnings . . . . .  | 1,678            | 1,610             | 3,279            | 1,831            |
| <b>Net Income Retained in Business . . . . .</b>  | <b>\$ 806</b>    | <b>\$ (3,449)</b> | <b>\$ 1,342</b>  | <b>\$ 3,823</b>  |
| Retained Earnings at Beginning of Year <sup>b</sup> . . . .   | 30,694           | 30,647            | 25,358           | 25,655           |
| Adjustments to Retained Earnings <sup>c</sup> . . . . .   | (707)            | (1,673)           | (754)            | (9)              |
| <b>Retained Earnings at End of Year<sup>d</sup> . . . . .</b>   | <b>\$ 30,793</b> | <b>\$ 25,528</b>  | <b>\$ 25,946</b> | <b>\$ 29,470</b> |

### OPERATING RATIOS

|   |      |                    |      |      |
|---|------|--------------------|------|------|
| Income before Taxes as Percent of<br>Net Sales . . . . .  | 3.1% | (1.3)%             | 5.2% | 6.7% |
| Provision for Current & Deferred Domestic<br>Income Taxes as Percent of Income<br>before Taxes (Total Income) . . . . . | 40.6 | (4.0) <sup>f</sup> | 31.1 | 30.1 |
| Income after Taxes (Net Profit) as Percent<br>of Net Sales . . . . .  | 1.8  | (1.4)              | 3.6  | 4.7  |
| Income after Taxes (Net Profit) as Percent<br>of Stockholders' Equity <sup>e</sup> . . . . .                            | 6.1  | (5.2)              | 13.2 | 14.8 |
| Income after Taxes (Net Profit) as Percent<br>of Total Assets <sup>e</sup> . . . . .                                    | 1.9  | (1.2)              | 3.5  | 4.3  |

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

- a Based on sample of corporate entities classified in SIC codes 372 and 376, having as their principal activity the manufacture of aircraft, guided missiles, space vehicles, their propulsion, and parts.
- b Beginning-of-year retained earnings for any particular year do not equal end-of-year retained earnings for the previous year because of rotation of small companies in survey sample.
- c Other direct credits (or charges) to retained earnings (net), including stock and other non-cash dividends, etc.
- d Retained Earnings at End of Year CALCULATED AS Retained Earnings at Beginning of Year PLUS Income (Loss) after Income Taxes MINUS Cash Dividends Charged to Retained Earnings PLUS Adjustments to Retained Earnings.
- e Average of four quarters.
- f Revised.

BALANCE SHEET FOR AEROSPACE COMPANIES<sup>a</sup>

December 31, 1991–1994

(Millions of Dollars)

|   | 1991             | 1992             | 1993             | 1994             |
|---|------------------|------------------|------------------|------------------|
| <b>Assets:</b>  |                  |                  |                  |                  |
| Current Assets:   |                  |                  |                  |                  |
| Cash .....  | \$ 2,950         | \$ 3,963         | \$ 3,544         | \$ 2,766         |
| Securities, Commercial Paper, & Other<br>Short-term Financial Investments ..... | 3,468            | 3,269            | 3,316            | 3,576            |
| Total Cash and U.S. Government<br>and Other Securities .....                    | \$ 6,418         | \$ 7,233         | \$ 6,860         | \$ 6,341         |
| Receivables (Total) .....   | 17,812           | 15,762           | 15,991           | 16,809           |
| Inventories (Gross) .....   | 49,973           | 44,010           | 42,276           | 39,123           |
| Other Current Assets .....  | 2,166            | 3,930            | 4,396            | 4,341            |
| <b>Total Current Assets</b> .....   | <b>\$ 76,370</b> | <b>\$ 70,934</b> | <b>\$ 69,524</b> | <b>\$ 66,615</b> |
| Net Plant, Property, & Equipment .....  | 26,557           | 27,483           | 27,698           | 26,406           |
| Other Non-Current Assets .....  | 28,012           | 29,354           | 35,526           | 39,245           |
| <b>Total Assets</b> .....   | <b>\$130,939</b> | <b>\$127,770</b> | <b>\$132,747</b> | <b>\$132,266</b> |
| <b>Liabilities:</b>   |                  |                  |                  |                  |
| Current Liabilities:  |                  |                  |                  |                  |
| Short Term Loans .....  | \$ 1,943         | \$ 1,735         | \$ 2,031         | \$ 1,787         |
| Trade Accounts & Notes Payable .....  | 12,188           | 11,290           | 11,491           | 10,871           |
| Income Taxes Accrued .....  | 1,151            | 1,288            | 1,882            | 1,929            |
| Installments Due on Long Term Debts ..  | 1,767            | 2,264            | 1,260            | 1,137            |
| Other Current Liabilities .....   | 44,823           | 39,175           | 38,697           | 35,159           |
| <b>Total Current Liabilities</b> .....  | <b>\$ 61,871</b> | <b>\$ 55,752</b> | <b>\$ 55,360</b> | <b>\$ 50,882</b> |
| Long Term Debt .....  | 20,682           | 19,241           | 20,452           | 19,832           |
| Other Non-Current Liabilities .....   | 8,123            | 18,318           | 20,505           | 21,270           |
| <b>Total Liabilities</b> .....  | <b>\$ 90,676</b> | <b>\$ 93,310</b> | <b>\$ 96,316</b> | <b>\$ 91,984</b> |
| <b>Stockholders' Equity:</b>  |                  |                  |                  |                  |
| Capital Stock .....   | \$ 9,681         | \$ 8,037         | \$ 10,346        | \$ 9,706         |
| Retained Earnings .....   | 30,581           | 26,424           | 26,086           | 30,557           |
| <b>Total Stockholders' Equity</b> .....   | <b>\$ 40,262</b> | <b>\$ 34,460</b> | <b>\$ 36,431</b> | <b>\$ 40,282</b> |
| <b>Total Liabilities &amp; Stockholders' Equity</b> ....                        | <b>\$130,939</b> | <b>\$127,770</b> | <b>\$132,747</b> | <b>\$132,266</b> |
| <b>Net Working Capital</b> .....  | <b>\$ 14,499</b> | <b>\$ 15,183</b> | <b>\$ 14,164</b> | <b>\$ 15,733</b> |

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

NOTE: Detail may not add to totals because of rounding.

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

## NEW PLANT AND EQUIPMENT EXPENDITURES

Calendar Years 1965–1994

(Billions of Dollars)

| Year              | All Industries | All Manufacturing Industries | Durable Goods | Aerospace <sup>a</sup> |                               |
|-------------------|----------------|------------------------------|---------------|------------------------|-------------------------------|
|                   |                |                              |               | Current Dollars        | Constant Dollars <sup>b</sup> |
| 1965              | \$ 59.52       | \$ 25.41                     | \$13.49       | \$0.53                 | \$1.57                        |
| 1966              | 70.40          | 31.37                        | 17.23         | 1.17                   | 3.38                          |
| 1967              | 72.75          | 32.25                        | 17.83         | 1.25                   | 3.49                          |
| 1968              | 76.42          | 32.34                        | 17.93         | 1.23                   | 3.32                          |
| 1969              | 85.74          | 36.27                        | 19.97         | 1.29                   | 3.37                          |
| 1970              | 91.91          | 36.99                        | 19.80         | 0.88                   | 2.19                          |
| 1971              | 92.91          | 33.60                        | 16.78         | 0.63                   | 1.51                          |
| 1972              | 103.40         | 35.42                        | 18.22         | 0.68                   | 1.59                          |
| 1973              | 120.03         | 42.35                        | 22.63         | 0.79                   | 1.79                          |
| 1974              | 139.67         | 52.48                        | 26.77         | 1.21                   | 2.40                          |
| 1975              | 142.42         | 53.66                        | 25.37         | 1.19                   | 2.04                          |
| 1976              | 158.44         | 58.53                        | 27.50         | 1.02                   | 1.64                          |
| 1977              | 184.82         | 67.48                        | 32.77         | 1.14                   | 1.72                          |
| 1978              | 216.81         | 78.13                        | 39.02         | 1.77                   | 2.48                          |
| 1979              | 255.26         | 95.13                        | 47.72         | 2.71                   | 3.50                          |
| 1980              | 286.40         | 112.60                       | 54.82         | 3.60                   | 4.20                          |
| 1981              | 324.73         | 126.68                       | 58.93         | 3.40                   | 3.59                          |
| 1982              | 326.19         | 123.97                       | 54.58         | 3.45                   | 3.45                          |
| 1983              | 321.16         | 117.35                       | 51.61         | 2.95                   | 2.87                          |
| 1984              | 373.83         | 139.61                       | 64.57         | 3.63                   | 3.45                          |
| 1985              | 410.12         | 152.88                       | 70.87         | 3.51                   | 3.27                          |
| 1986              | 399.36         | 137.95                       | 65.68         | 3.86                   | 3.52                          |
| 1987              | 410.52         | 141.06                       | 68.03         | 3.60                   | 3.22                          |
| 1988              | 455.49         | 163.45                       | 77.04         | 3.49                   | 3.05                          |
| 1989              | 507.40         | 183.80                       | 82.56         | 4.17                   | 3.51                          |
| 1990              | 532.61         | 192.61                       | 82.58         | 4.02                   | 3.27                          |
| 1991              | 528.39         | 182.81                       | 77.64         | 4.05                   | 3.20                          |
| 1992              | 546.60         | 174.02                       | 73.32         | 4.36                   | 3.38                          |
| 1993 <sup>r</sup> | 586.73         | 179.47                       | 81.45         | 3.22                   | 2.45                          |
| 1994 <sup>E</sup> | 638.37         | 192.56                       | 92.78         | 2.95                   | 2.20                          |

Source: Bureau of the Census, "Plant and Equipment Expenditures and Plans" (Quarterly).

a Data are company-based (not establishment nor product-based) and represent corporate entities whose principal activity falls in SIC codes 372 and 376.

b Based on the Producer Price Index, Capital Equipment (1982=100).

E Estimate.

r Revised.

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

By Geographic Region  
Fiscal Years 1992, 1993, and 1994

| Program and Region  | Millions of Dollars |          |          | Percent of Program Total |        |        |
|---|---------------------|----------|----------|--------------------------|--------|--------|
|   | 1992                | 1993     | 1994     | 1992                     | 1993   | 1994   |
| <b>AIRCRAFT—TOTAL</b> .....   | \$26,440            | \$26,183 | \$27,449 | 100.0%                   | 100.0% | 100.0% |
| New England .....   | 2,981               | 2,717    | 2,127    | 11.3                     | 10.4   | 7.8    |
| Middle Atlantic .....   | 2,859               | 1,808    | 1,713    | 10.8                     | 6.9    | 6.2    |
| East North Central .....  | 1,538               | 1,533    | 1,542    | 5.8                      | 5.9    | 5.6    |
| West North Central .....  | 2,811               | 4,728    | 5,246    | 10.6                     | 18.1   | 19.1   |
| South Atlantic .....  | 4,394               | 4,972    | 5,274    | 16.6                     | 19.0   | 19.2   |
| East South Central .....  | 407                 | 355      | 350      | 1.5                      | 1.4    | 1.3    |
| West South Central .....  | 3,205               | 3,595    | 2,995    | 12.1                     | 13.7   | 10.9   |
| Mountain .....  | 474                 | 830      | 524      | 1.8                      | 3.2    | 1.9    |
| Pacific <sup>a</sup> .....  | 7,772               | 5,645    | 7,678    | 29.4                     | 21.6   | 28.0   |
| <b>MISSILE &amp; SPACE<br/>SYSTEMS—TOTAL</b> .....                  | \$14,468            | \$14,460 | \$13,015 | 100.0%                   | 100.0% | 100.0% |
| New England .....   | 1,715               | 2,168    | 1,743    | 11.9                     | 15.0   | 13.4   |
| Middle Atlantic .....   | 1,088               | 766      | 714      | 7.5                      | 5.3    | 5.5    |
| East North Central .....  | 81                  | 85       | 101      | 0.6                      | 0.6    | 0.8    |
| West North Central .....  | 445                 | 592      | 438      | 3.1                      | 4.1    | 3.4    |
| South Atlantic .....  | 1,370               | 1,244    | 1,345    | 9.5                      | 8.6    | 10.3   |
| East South Central .....  | 848                 | 753      | 602      | 5.9                      | 5.2    | 4.6    |
| West South Central .....  | 1,268               | 1,062    | 1,237    | 8.8                      | 7.3    | 9.5    |
| Mountain .....  | 2,241               | 2,608    | 2,337    | 15.5                     | 18.0   | 18.0   |
| Pacific <sup>a</sup> .....  | 5,411               | 5,181    | 4,498    | 37.4                     | 35.8   | 34.6   |
| <b>ELECTRONICS &amp;<br/>COMMUNICATIONS<br/>EQUIPMENT—TOTAL</b> ... | \$15,777            | \$16,467 | \$14,230 | 100.0%                   | 100.0% | 100.0% |
| New England .....   | 1,435               | 1,304    | 1,139    | 9.1                      | 7.9    | 8.0    |
| Middle Atlantic .....   | 2,707               | 2,559    | 2,001    | 17.2                     | 15.5   | 14.1   |
| East North Central .....  | 1,143               | 1,409    | 1,220    | 7.2                      | 8.6    | 8.6    |
| West North Central .....  | 874                 | 797      | 580      | 5.5                      | 4.8    | 4.1    |
| South Atlantic .....  | 4,061               | 4,682    | 4,613    | 25.7                     | 28.4   | 32.4   |
| East South Central .....  | 175                 | 420      | 437      | 1.1                      | 2.6    | 3.1    |
| West South Central .....  | 848                 | 887      | 712      | 5.4                      | 5.4    | 5.0    |
| Mountain .....  | 565                 | 624      | 667      | 3.6                      | 3.8    | 4.7    |
| Pacific <sup>b</sup> .....  | 3,969               | 3,784    | 2,861    | 25.2                     | 23.0   | 20.1   |

Source: Department of Defense, "Prime Contract Awards by Region and State" (Annually).

NOTE: Detail may not add to totals because of rounding.

<sup>a</sup> Includes Alaska and Hawaii.

## DEPARTMENT OF DEFENSE MAJOR CONTRACTORS

Fiscal Years 1990–1994  
Listed by rank according to net value of  
prime contracts awarded during last fiscal year  
(Millions of Dollars)

| Company                                  | 1990      | 1991      | 1992      | 1993      | 1994             |
|--|-----------|-----------|-----------|-----------|------------------|
| <b>TOTAL CONTRACTS</b> .....             | \$130,758 | \$136,640 | \$121,438 | \$123,713 | \$118,114        |
| McDonnell Douglas Corp. ....             | \$ 8,211  | \$ 8,057  | \$ 5,311  | \$ 7,540  | \$ 9,266         |
| Lockheed Corp. ....                      | 3,553     | 2,667     | 4,650     | 6,911     | 6,518            |
| Northrop Grumman Corp. <sup>b</sup> .... | 3,443     | 5,682     | 7,034     | 4,709     | 5,202            |
| Martin Marietta Corp. ....               | 3,492     | 2,689     | 2,356     | 4,727     | 3,134            |
| General Motors Corp. ....                | 4,107     | 4,427     | 3,694     | 4,076     | 3,041            |
| General Dynamics Corp. ....              | 6,306     | 7,848     | 4,464     | 2,147     | 2,801            |
| Raytheon Co. ....                        | 4,071     | 4,090     | 2,841     | 3,233     | 2,738            |
| General Electric Co. ....                | 5,589     | 4,866     | 4,008     | 1,606     | 2,705            |
| United Technologies Corp. ....           | 2,856     | 2,825     | 2,803     | 3,083     | 2,677            |
| Loral Corp. ....                         | 618       | 1,283     | 1,815     | 1,729     | 1,681            |
| Litton Industries Inc. ....              | 1,576     | 1,601     | 2,334     | 1,555     | 1,576            |
| Westinghouse Electric Corp. ....         | 2,243     | 1,812     | 1,147     | 1,569     | 1,357            |
| Textron Inc. ....                        | 1,190     | 997       | 1,161     | 955       | 1,236            |
| The Boeing Co. ....                      | 2,267     | 1,166     | 2,495     | 1,664     | 1,195            |
| Rockwell International Corp. ....        | 2,217     | 1,708     | 1,233     | 1,317     | 1,062            |
| Avondale Industries ....                 | 541       | 344       | 173       | 587       | 902              |
| Science Application Int'l Corp. ....     | 510       | 513       | 686       | 786       | 868              |
| TRW Inc. ....                            | 1,087     | 1,092     | 1,013     | 1,160     | 848              |
| Bath Holding Corp. ....                  | 734       | 872       | 1,148     | 997       | 798 <sup>c</sup> |
| GTE Corp. ....                           | 1,294     | 801       | 724       | 714       | 788              |
| E-Systems Inc. ....                      | 460       | 603       | 501       | 754       | 769              |
| Texas Instruments Inc. ....              | 704       | 982       | 731       | 968       | 690              |
| Unisys Corp. ....                        | 1,376     | 1,379     | 834       | 717       | 640              |
| ITT Corp. ....                           | 870       | 948       | 797       | 614       | 609              |
| Computer Sciences Corp. ....             | 319       | 406       | 495       | 422       | 589              |
| FMC Corporation ....                     | 634       | 1,467     | 448       | 508       | 582              |
| IBM Corp. ....                           | 1,286     | 773       | 932       | 849       | 562              |
| AT&T Co. ....                            | 769       | 699       | 1,338     | 870       | 538              |
| Exxon Corp. ....                         | 438       | 549       | 306       | 419       | 530              |
| BDM ....                                 | 156       | 168       | 209       | 312       | 528 <sup>d</sup> |

Source: Department of Defense, "100 Companies Receiving the Largest Dollar Volume of Prime Contract Awards" (Annually).

- a Not in top 100 companies for indicated year(s).  
b Includes awards previously reported as Grumman Corporation.  
c Listed as Fulcrum II Limited Partnerships.  
d Listed as Carlyle Partners Leveraged Corporation.

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MAJOR CONTRACTORS

Fiscal Years 1991-1994  
By rank according to net value of NASA prime  
contracts awarded during last fiscal year  
(Millions of Dollars)

| Company                                  | 1991     | 1992     | 1993     | 1994     |
|--|----------|----------|----------|----------|
| <b>TOTAL PROCUREMENTS</b> .....          | \$13,159 | \$13,478 | \$13,160 | \$12,913 |
| <b>Awards to Business Firms</b> .....    | 10,417   | 10,717   | 10,498   | 9,966    |
| % of TOTAL PROCUREMENTS ....             | 79 %     | 79 %     | 80 %     | 77 %     |
| The Boeing Co. ....                      | \$ 468   | \$ 500   | \$ 502   | \$ 1,142 |
| Rockwell International Corp. ....        | 1,560    | 1,449    | 1,491    | 1,069    |
| Lockheed Space Operations Co. ...        | 591      | 599      | 590      | 572      |
| McDonnell Douglas Corp. ....             | 1,089    | 1,045    | 997      | 565      |
| Martin Marietta Corp. <sup>b</sup> ..... | 880      | 744      | 611      | 498      |
| Thiokol Corp. ....                       | 438      | 510      | 479      | 431      |
| Rockwell Space Operations Inc. ...       | 343      | 346      | 351      | 338      |
| Computer Sciences Corp. ....             | 207      | 232      | 195      | 255      |
| AlliedSignal Technical Services ....     | (a)      | (a)      | 231      | 247      |
| TRW Inc. ....                            | 192      | 194      | 218      | 235      |
| Lockheed Missiles & Space Co. ...        | 458      | 530      | 430      | 222      |
| Lockheed Engrg. & Science Co. ...        | 259      | 270      | 256      | 216      |
| EG&G Florida Inc. ....                   | 227      | 213      | 221      | 200      |
| USBI Booster Production Co. ....         | 198      | 207      | 177      | 156      |
| Loral Aerospace Corp. ....               | 186      | 141      | 137      | 119      |
| United Technologies Corp. ....           | 133      | 136      | 97       | 119      |
| Grumman Aerospace Corp. ....             | 100      | 103      | 163      | 111      |
| Space Systems Loral, Inc. ....           | (a)      | 95       | 77       | 91       |
| Boeing Computer Support Services ..      | 159      | 140      | 155      | 84       |
| Santa Barbara Research Center ....       | 13       | 32       | 48       | 82       |
| General Dynamics Corp. ....              | 19       | 49       | 23       | 78       |
| Johnson Controls World Serv. Inc. .      | 70       | 76       | 67       | 70       |
| Sverdrup Technology Inc. ....            | 97       | 109      | 107      | 66       |
| IBM Corp. ....                           | 68       | 76       | 55       | 64       |
| Teledyne Industries Inc. ....            | 65       | 54       | 56       | 63       |
| BAMSI Inc. ....                          | 52       | 59       | 57       | 58       |
| Spacehab Inc. ....                       | 8        | 38       | 50       | 56       |
| Hughes STX Corp. ....                    | (a)      | (a)      | 35       | 54       |
| Sterling Federal Systems Inc. ....       | 34       | 44       | 58       | 52       |
| Hughes Applied Info Systems ....         | (a)      | (a)      | 58       | 51       |

Source: National Aeronautics and Space Administration, "Annual Procurement Report" (Annually).

a Not in list of major contractors for indicated year(s).

b Includes awards previously reported as General Electric Co.

# Glossary

---

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

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

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

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

**Aerospace Sales:** the AIA estimate of aerospace industry sales, developed by summing: DoD expenditures for aircraft, missiles, and space-related *procurement* and *RDT&E*; NASA expenditures for *research and development* and space flight control and data communications; *outlays* for space activities by other U.S. government departments and agencies; commercial sales of space-related products; net domestic and export sales of civil aircraft, engines, and parts; *For-*

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

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

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

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

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

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

**Airframe:** the structural components of an airplane, such as: fuselage, empennage, wings, landing gear, and engine mounts, but excluding such

items as: engines, accessories, electronics, and other parts that may be replaced from time to time.

**Airlines:** see *Air Carriers*.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**DoD:** Department of Defense.

**DoE:** Department of Energy.

**DoT:** Department of Transportation.

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

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

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

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



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

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

**Expenditures (Federal Budget):** see *Outlays*.

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

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

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

**Facility:** a physical plant or installation including: real property, build-

ing, structures, improvements, and plant equipment.

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

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

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

**FY:** see *Fiscal Year*.

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

**General Agreement on Tariffs and Trade (GATT):** a multilateral treaty among over 100 governments whose primary mission is the reduction of trade barriers. A World Trade Organization will be created by 1997 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 helicop-

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

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

**Research:** see *Research and Development*.

**Research and Development:**

**Research:** systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research is classified as either basic or applied according to the objectives of the sponsoring agency. *Applied Research:* with the objective of gaining knowledge or understanding necessary for determining the means by which a recognized and specific need may be met. *Basic Research:* with the objective of gaining fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind.

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

**Independent Research and Development (IR&D):** a term devised by the Department of Defense and used by Federal agencies to differentiate between a contractor's research and development technical effort performed under a contract, grant, or other

arrangement (R&D) and that which is self-initiated and self-funded (IR&D).

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

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

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

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

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

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

**Stockholder's Equity:** *assets* minus all obligations of the corporation, except those to stockholders. Annual data are average equity for the year (using four end-of-quarter figures). For details, see "Quarterly

areas such as: services, agriculture, and trade-related intellectual property rights.

**NASA:** National Aeronautics and Space Administration.

**NATO:** North Atlantic Treaty Organization.

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

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

**OASD:** Office of the Assistant Secretary of Defense.

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

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

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

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

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

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

**Passenger-Mile:** one passenger moved one mile.

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

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

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

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

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

**Research:** see *Research and Development*.

**Research and Development:**

**Research:** systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research is classified as either basic or applied according to the objectives of the sponsoring agency. *Applied Research:* with the objective of gaining knowledge or understanding necessary for determining the means by which a recognized and specific need may be met. *Basic Research:* with the objective of gaining fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind.

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

**Independent Research and Development (IR&D):** a term devised by the Department of Defense and used by Federal agencies to differentiate between a contractor's research and development technical effort performed under a contract, grant, or other

arrangement (R&D) and that which is self-initiated and self-funded (IR&D).

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

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

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

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

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

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

**Stockholder's Equity:** *assets* minus all obligations of the corporation, except those to stockholders. Annual data are average equity for the year (using four end-of-quarter figures). For details, see "Quarterly

Financial Report for Manufacturing, Mining and Trade Corporations," compiled by the *Bureau of the Census*.

**STOL:** short take-off and landing aircraft.

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

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

**Ton-Mile:** one ton moved one mile.

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

**Trade Balance:** see *Merchandise Trade Balance*.

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

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

**UK:** United Kingdom.

**US:** United States of America.

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

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

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

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

**Utility Aircraft:** an aircraft designed for general purpose flying.

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

# Index

---

- A**ctive Civil Aircraft, 84–87, 90, 91, 96–99
- Aeronautics, 108, 109
- Aerospace Industry
  - Average Earnings, 147, 148
  - Backlog, 17, 29, 33, 55, 60, 61
  - Balance of Trade, 119
  - Balance Sheet, 159
  - Comparison with All Manufacturing and/or Durable Goods, 18, 140, 141, 152, 157, 160
  - Employment, 140, 142–146, 150
  - Exports, 119–122, 124, 125, 128–130, 132, 134–137
  - Finance, 157–160
  - Imports, 119, 121, 123, 126, 127, 129, 131, 132
  - Orders, 17, 29, 55, 60, 61, 112, 161–163
  - Payroll, 141
  - Profits, 157, 158
  - Research and Development, 72, 104–115
  - Sales, 13, 15, 16, 18, 28, 30–32, 34, 37–43, 55, 60, 61, 157, 158
  - SIC Codes, 12
- Air Cargo, 76, 77, 80, 82
- Air Force
  - Aircraft Acceptances, 41, 43
  - Aircraft Procurement, 41, 43, 44, 46
  - Major Missile Systems, 52–54
  - Missile Procurement, 50–54
  - RDT&E, 110, 111, 114, 115
- Air Transportation, 74–99
  - Aircraft, 26–47, 88–91, 94–99
  - Active Civil, 84–87, 90, 91, 96–99
  - Airlines, 84–87, 90, 91, 96, 97
  - Backlog, 17, 29, 33
  - Employment, 142, 143, 145, 146
  - Exports, 30, 31, 38, 43, 122, 124, 125, 128–130, 134–137
  - Flyaway Cost, Military, 40–43
  - Imports, 123, 126, 127, 129, 131
  - Installed Engine Market Share, 88, 89
  - Military, 15, 21–23, 31, 38, 40–47, 115, 122–124, 126, 127, 132, 146, 161
  - On Order, 17, 29, 33, 35, 47
  - Orders, 17, 29, 112, 161
  - Outlays, DoD, 21–23, 46
  - Prime Contract Awards, 112, 161
  - Procurement, DoD, 21–23, 31, 40–44, 46, 47, 161
  - Production, 30–32, 34, 37–43
  - RDT&E, DoD, 112, 115
  - Sales, 15, 16, 28, 30–32, 34, 37–43
  - Transports, 30, 32–35, 40–42, 44, 47, 79, 84–92, 96, 97, 99, 120, 122–128, 134–137
- Airlines
  - Domestic, 78–83, 92
  - Finances, 76, 78–81, 92, 134–137
  - Flight Equipment, 79, 84–91, 96, 97, 99
  - Foreign, 76, 77, 136, 137
  - Fuel, 92
  - Helicopters, 85, 87, 91, 97
  - Miles Flown, 82
  - Passenger-Miles, 77, 82, 83
  - Traffic, 77, 82, 83
  - U.S. Fleet, 90, 91, 96, 97, 99
  - World Airline Fleet, 84–89
- Airports, 93–95
- Applied Research and Development, 106
- Army
  - Aircraft Acceptances, 41, 43
  - Aircraft Procurement, 41, 43, 44, 46
  - Major Missile Systems, 53, 54
  - Missile Procurement, 50, 51, 53, 54
  - RDT&E, 110, 111, 114, 115
- Assets
  - Aerospace Industry, 157, 159
  - Airlines, 79, 84–91, 96, 97, 99
- Astronautics
  - Outlays, 66, 67, 70, 71
  - RDT&E, 112
- B**acklog
  - Aerospace, 17, 29, 33, 55, 60, 61
  - Aircraft, 17, 29, 33
  - Engines, 17, 29, 61
  - Missiles, 17, 55
  - Space, 17, 60
  - Transport Aircraft, 33
- Balance of Trade, 121

Balance Sheet  
Aerospace Companies, 159  
Ballistic Missile Defense Organization  
Budget Program, 56, 57  
Basic Research Funds, 106  
Bombers  
Exports, 122, 128  
Flyaway Costs, 40, 41  
Production, 40, 41  
Business Flying, 97, 99

**C**apital Spending, 160  
Cargo Ton-Miles, 77, 82  
Civil Airports, 93–95  
Commercial Flying, See *Business Flying*

Communications Equipment  
Contract Awards, 112, 161  
Constant Dollars, See *Deflators*  
Contract Awards  
DoD, 112, 113, 161, 162  
NASA, 163

**D**efense Contractors, 162  
Deflators, 24, 25  
Deliveries, See *Production*  
Department of Defense  
Aerospace Sales, 13, 20–23  
Aircraft  
Flyaway Cost, 40–43  
Outlays, 21–23, 46  
Procurement, 21–23, 31, 40–44,  
46, 47, 161  
R&D, Aeronautics, 108, 109  
RDT&E, 115  
Contractors, 162  
Missiles, 21–23, 50–57  
Exports, 122  
Outlays, 21–23, 51  
Procurement, 21–23, 50–54  
RDT&E, 112, 114  
Outlays, 19–23, 46, 51, 103, 108,  
109, 111  
Aerospace, 20–23, 46, 51, 108,  
109, 111  
Aircraft, 21–23, 46  
Functional Title, 22, 23  
Missiles, 21–23, 51  
Personnel, 22, 23  
R&D, 103, 108, 109  
RDT&E, 22, 23, 103, 109, 111  
Personnel, 22, 23, 151

Prime Contract Awards, 112, 113,  
161, 162  
Procurement, 20–23, 31, 40–44, 46,  
47, 50–54, 73, 161  
RDT&E, 22, 23, 103, 108–115  
Space Activities, 66–68, 73, 112  
Department of Energy, 66–68, 103  
Department of Transportation  
Aeronautics R&D, 108, 109  
Durable Goods Industry  
Employment, 140  
New Plant and Equipment  
Expenditures, 160  
Profits, 157  
Sales, 18

**E**arnings  
Companies, 157, 158, 162, 163  
Employees, 141, 147, 148  
Electronics  
Prime Contract Awards, 112, 163  
Employment, 107, 140, 142–146, 150,  
151  
All Manufacturing, 107, 140  
Durable Goods, 140  
NASA, 150  
Scientists and Engineers, R&D, 107  
Engines  
Aircraft  
Backlog, 17, 29  
Exports, 122, 132  
Imports, 123, 132  
Installed Market Share, 88, 89  
Orders, 17, 29  
Sales, 16, 28  
Missiles and Space Vehicles  
Backlog, 17, 61  
Exports, 122  
Orders, 17, 61  
Sales, 16, 61  
Export-Import Bank, 133–137  
Exports, 30, 31, 38, 43, 119–122, 124,  
125, 128–130, 132, 134–137  
Aerospace, 30, 31, 38, 43, 119–122,  
124, 125, 128–130, 132, 134–137  
Balance of Trade, 121  
Civil, 30, 120, 122, 125, 128–130,  
132, 134–137  
Engines, 122, 132  
General Aviation, 30, 122, 125, 130  
Helicopters, 30, 38, 43, 122, 124,  
125, 129  
Military, 31, 38, 43, 122, 124, 132  
Transports, 31, 122, 124, 125, 128,  
134–137

U.S. Merchandise, 119, 120  
Used Aircraft, 122, 124, 125

## **F**ederal (U.S. Government)

Aerospace Sales, 13, 16, 20, 21, 28  
Backlog, 17, 29  
Orders, 17, 29, 112, 113, 161–163  
Outlays, 19–23, 46, 51, 66, 67, 70,  
71, 103, 108, 109, 111  
Research and Development,  
102–106, 108–115

## **F**ighter Aircraft

Exports, 122, 124  
Flyaway Cost, 40–43  
Procurement, 40–43, 46, 47  
Production, 40–43  
RDT&E, 115

## **F**inances

Airlines, 76, 78–81, 92  
Government, *See Outlays and  
Federal*  
Industry, 157–160

## **F**lying Hours, 98, 99

Foreign Trade, 30, 31, 38, 43, 118–137  
*See also Imports and Exports*

## **F**uel, 92

Funds, Research, 102–106, 108–115

## **G**eneral Aviation

Active Civil Aircraft, 96–99  
Exports, 30, 122, 125, 130  
Hours Flown, 98, 99  
Imports, 123, 126, 127, 131  
Shipments, 30, 32, 39

## **G**eographic Distribution

Airports, 93–95  
Contract Awards, 113, 161  
Exports, 121, 128–130, 136, 137  
Heliports, 94, 95  
Imports, 121, 129, 131

Government, *See Federal*

Gross Domestic Product, 18, 19  
Deflator Series, 24

**H**elicopters, 30, 32, 36–38, 40–47,  
85, 87, 91, 94–98, 115, 122–127,  
129, 130, 145

Active Civil, 85, 87, 91, 96–98  
Exports, 30, 38, 43, 122, 124, 125,  
129

Flyaway Cost, Military, 40–43  
Imports, 123, 126, 127, 129  
Military, 38, 40–45, 47, 122, 124

Production, 30, 32, 37, 38, 40–43  
Specifications, 36  
U.S. Airlines, 91  
World Civil Airlines, 85, 87

Heliports, 94, 95

## **H**ours Flown

General Aviation, 98, 99

## **I**llness Rates, 152

Implicit Price Deflators, 24, 25

## **I**mports

Aerospace, 119, 121, 123, 126, 127,  
129, 131, 132  
Aircraft, 123, 126, 127, 129, 131  
Engines, 123, 132  
General Aviation, 123, 126, 127, 131  
Helicopters, 123, 126, 127, 129

Income Accounts, 76, 78, 80, 158

Industrial Research and Development,  
102, 104–106

## **I**njury Rates, 152

Instructional Flying, 97, 99

## **I**nvestment in Equipment

Aerospace Industry, 159, 160  
Durable Goods Industries, 160  
Manufacturing Industries, 160  
Non-farm Business, 160  
U.S. Airlines, 79, 90–91, 96–97, 99

## **L**iabilitys, Corporate, 159

## **M**ajor Contractors, 162, 163

## **M**anufacturing Industries

Employment, 140  
New Plant and Equipment  
Expenditures, 160

Payroll, 141

Profits, 157

Sales, 18, 157

Work Injury and Illness Rates, 152

Miles Flown, 77, 82, 83

Military Exports, 31, 43, 122, 124, 132

Missiles, 15–17, 21–23, 50–57, 61,  
112, 114, 122, 123

Backlog, 17, 55

Employment, 142, 146

Engines, 61, 122

Exports, 122

Major Missile Systems, 50, 52–54,  
114

Orders, 17, 55, 112

Outlays, 21–23, 51

Prime Contract Awards, 112, 161



- Procurement, 21–23, 50, 51, 161
  - RDT&E, DoD, 112, 114
  - Sales, 15, 16, 55, 61
- N**ational Aeronautics and Space Administration
- Aeronautics, R&D, 108, 109
  - Aerospace Sales, 13, 20, 21
  - Budget Authority, 68, 69, 72
  - Construction of Facilities, 69–71
  - Contractors, 163
  - Employment, 150
  - Outlays, 20, 21, 66, 67, 70, 71, 103, 108, 109
  - Research & Program Management, 69–71
  - Research and Development, 69–72, 103, 108, 109
- National Defense, 19, 20
- Navy
- Aircraft Acceptances, 42, 43
  - Aircraft Procurement, 42–44, 46
  - Major Missile Systems, 52–54
  - Missile Procurement, 50–54
  - RDT&E, 110, 111, 114, 115
- O**perating Revenue
- U.S. Airlines, 78, 80
- O**rders
- Aerospace, 17, 29, 55, 60, 61, 112, 161–163
  - Aircraft, 17, 29, 112, 161
  - Engines, 17, 29, 61
  - Missiles, 17, 55, 112
  - Space, 17, 60, 61
- O**utlays
- Aircraft, 21–23, 46
  - Aerospace, 20–23, 46, 51, 66, 67, 70, 71, 108, 109, 111
  - Federal, 19–23, 46, 51, 66, 67, 70, 71, 103, 108, 109, 111
  - Missiles, 21–23, 51
  - National Defense, 19, 20
  - RDT&E, 22, 23, 111
- P**assenger-Miles, 77, 82, 83
- Passengers Carried, 77, 83
- Payroll, 141
- Plant and Equipment Expenditures, 160
- Prime Contract Awards
- DoD, 112, 113, 161, 162
  - NASA, 163
- Procurement, DoD
- Aerospace Products and Services, 21–23, 31, 40–44, 46, 47, 50, 51, 73, 161
  - Aircraft, 21–23, 31, 40–44, 46, 47, 161
  - Missiles, 21–23, 50, 51, 161
  - Total, 22, 23
- Production, Aircraft, 30–32, 34, 37–43
- General Aviation, 30, 32, 39
  - Helicopters, 30, 32, 37, 38, 40–43
  - Military, 31, 38, 40–43
  - Transport, 30, 32, 34, 40–42
- Profits, 157, 158
- R**DT&E, See *Research, Development, Test, and Evaluation*
- R**esearch
- Applied and Basic, 106
  - Research and Development, 52–54, 69–72, 102–110, 112
  - Aeronautics, 108, 109
  - DoD, 52–54, 103, 110, 112
  - DoT, 103, 108, 109
  - Energy, 103
  - Federal Funds, 102–106, 108, 109
  - Industrial, 102, 104–106
  - NASA, 69–72, 103, 108, 109
  - Scientists and Engineers, 107
- Research and Program Management
- NASA, 69–71
- Research, Development, Test, and Evaluation, DoD
- Aircraft, 112, 115
  - By Agency, 73, 110, 111, 114, 115
  - Contract Awards, 112, 113
  - Missiles, 112, 114
  - Outlays, 22, 23, 111
  - Space, 73
  - Total, 22, 23, 111
- S**ales
- Aerospace, 13, 15, 16, 18, 28, 30–32, 34, 37–44, 55, 60, 61, 157, 158
  - Aircraft, 15, 16, 28, 30–32, 34, 37–43
  - And National Economy, 18
  - By Customer, 13, 16, 28, 55, 60, 61
  - By Product, 15, 16, 28, 30–32, 34, 37–43, 55, 60, 61
  - Constant Dollars, 13, 15, 16, 18, 28, 55, 60, 61
  - Durable Goods, 18
  - Manufacturing Industries, 18, 157
  - Missiles, 15, 16, 55, 61
  - Related Products and Services, 13, 15

Space, 15, 16, 60, 61  
Scientists and Engineers, 107, 144, 145  
SIC Codes, 12  
Space, 15–17, 60–73  
  Backlog, 17, 60, 61  
  DoD, 66–68, 73  
  Employment, 150  
  Launchings, 63  
  NASA, 66–72  
  Orders, 60, 61  
  Procurement, 73  
  Programs, 72, 73  
  Sales, 15, 16, 60, 61  
  Space Launch Vehicles, 64, 65  
  Spacecraft Record, 62  
Standard Industrial Classifications, 12  
Stockholders' Equity, 157, 159  
Strategic Defense Initiative  
  Organization  
  See *Ballistic Missile Defense  
  Organization*  
Strikes, 153  
**T**axes, 158  
Trade Balance, 121  
Transportation  
  Air, 76–99  
  Helicopter, 85, 87, 91, 94–98  
Transports  
  Civil, 30, 32–35, 79, 84–92, 96, 97,  
  99, 120, 123, 125–128, 134–137  
  Engine Manufacturers, 88, 89  
  Exports, 30, 43, 120, 122, 124, 125,  
  128, 134–137

Imports, 123, 126, 127  
Military, 40–42, 44, 47, 122, 124  
On Order, 33, 35  
Production, 30, 32, 34, 35, 40–42, 47  
Specifications, 35, 47  
Turbojet Aircraft, 33, 35, 39, 45, 47,  
  84, 87–90, 97, 98, 134–137  
Turboprop Aircraft, 39, 45, 47, 86, 87,  
  90, 91, 97, 98

**U**sed Aircraft  
  Civil Exports, 122, 125  
  Civil Imports, 123, 126, 127  
  Military Exports, 122, 124  
Used Aircraft Engines  
  Exports, 132  
U.S. Airlines  
  Assets, 79, 90, 91, 96, 97, 99  
  Finances, 78–81, 92  
  Fleet, 90, 91, 96, 97, 99  
  Net Investment, 79  
  Operating Expenses, 78, 81, 92  
  Operating Revenues, 78, 80  
  Traffic, 82, 83

**W**ages, 147, 148  
Work Illness and Injury Rates, 152  
Work Stoppages, 153  
Working Capital, 159  
World Airlines  
  Finances, 78, 134–137  
  Fleet, 84–89  
  Traffic, 77

# **AIA Member Companies**

---

AAI Corporation  
Aerojet, A Segment of GenCorp  
Alliant Techsystems Inc.  
AlliedSignal Aerospace  
American Pacific Corporation  
Argo-Tech Corporation  
B.H. Aircraft Company, Inc.  
The Boeing Company  
Chrysler Technologies Corporation  
Coltec Industries Inc.  
    Chandler Evans  
    Delavan Gas Turbine  
    Menasco Aerosystems  
    Walbar  
Computing Devices International  
Digital Equipment Corporation  
Dowty Aerospace  
    Yakima  
    Los Angeles  
DuPont Company  
FMC Corporation  
GEC-Marconi Electronic Systems Corporation  
General Dynamics Corporation  
General Electric Company  
The BFGoodrich Company  
    Landing Systems  
    Maintenance, Repair, and Overhaul  
    Safety Systems  
    Sensors and Integrated Systems  
Gulfstream Aerospace Corporation  
Harris Corporation  
Heath Tecna Aerospace Company  
HEICO Corporation  
Hexcel Corporation  
Honeywell Inc.  
Hughes Electronics Corporation  
    Delco Electronics Corporation  
    Hughes Aircraft Company  
    Hughes Telecommunications  
    and Space Company  
    DIRECTV, Inc.  
    Hughes Network Systems, Inc.  
ITT Defense and Electronics Inc.  
Kaman Aerospace Corporation  
Lockheed Martin Corporation  
Loral Vought Systems Corporation  
Lord Corporation  
Lucas Aerospace Inc.  
McDonnell Douglas Corporation  
Northrop Grumman Corporation  
Parker Hannifin Corporation  
Raytheon Company  
Rockwell International Corporation  
Rohr, Inc.  
Rolls Royce North America Inc.  
Sundstrand Corporation  
Teledyne, Inc.  
    Teledyne Brown Engineering  
    Teledyne Controls  
Teleflex Inc./TFX Aerospace Group  
    Teleflex Aerospace/Defense  
    Mal Tool & Engineering  
Texas Instruments Incorporated  
    Defense Systems & Electronics Group  
Textron Inc.  
Thiokol Corporation  
TRW Inc.  
United Technologies Corporation  
    Aerospace/Defense:  
    Pratt & Whitney  
    Sikorsky  
    Hamilton Standard  
Vought Aircraft Company  
Westinghouse Electric Corporation  
    Electronic Systems Group  
Williams International



**Aerospace  
Industries  
Association**

***Aerospace Industries  
Association of America, Inc.***

1250 Eye Street, NW  
Washington, DC 20005

