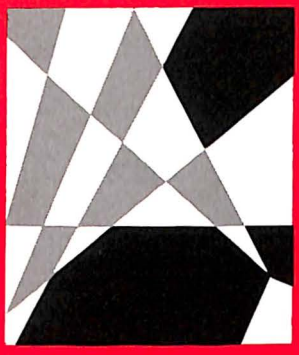
AEROSPACE FACTS AND FIGURES 1975/76

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.



1975/76 AEROSPACE FACTS AND FIGURES

Compiled by

Economic Data Service

Aerospace Research Center

Aerospace Industries Association of America, Inc.

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- Commerce (Bureau of the Census)
- Defense (Comptroller, Public Affairs, Army, Navy, Air Force)
- Labor (Bureau of Labor Statistics)
- Transportation (Federal Aviation Administration)

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FOREWORD

This volume tells the statistical story of the aerospace industry's performance in 1974, the most economically troubled year in recent memory.

It was a year of sharp recession, with attendant industrial disruption, unemployment, materials shortages, insufficient investment capital, declining demand and myriad other difficulties. Most of all there was rampant inflation that snowballed into double-digit percentages.

Because of this inflation, a word of qualification is in order with respect to the statistical detail of this edition of *Aerospace Facts and Figures.* In most of the categories covered, you will read of record sales. The statistics are accurate, but unless adjusted to compensate for inflation they present a somewhat distorted picture. As indicators of the industry's real productive effort, they are akin to measurement with a four-foot yardstick.

By the most accepted measurement of assessing real productivity—i.e., constant dollars—the aerospace industry achieved new highs in only two of the several categories statistically detailed on the following pages. As a whole, the industry experienced another downturn. The declining trend in evidence since 1968 continued, although the downward curve was less pronounced.

Despite the lower constant dollar level, the industry fared better than had been expected at the beginning of the year. In view of the general business climate, the results, though not gratifying, are at least encouraging.

There are two areas of industry performance which bear special mention. One was the wide acceptance of American aerospace products in the foreign market—solid evidence of superior quality. In 1974, aerospace exports amounted to an impressive $7.1 billion, $2 billion more than in the previous year. Since aerospace imports were relatively slight, the industry produced the greatest-ever aerospace trade surplus of $6.3 billion. In light of the overall U.S. trade deficit, this accomplishment was of vital importance to the national economy.

The other area of solid gain was the category embracing non-aerospace products. For some time, the industry has been diversifying its product line with an eye toward a broader sales base. Non-aerospace sales have increased consistently in dollar volume and as a percent of overall sales. In 1973, these sales topped the $3 billion level for the first time, but in 1974 they reached the $4 billion mark. This trend is satisfying testimony to the industry's technological versatility and a heartening augury for the future.

Sales considerations aside, the industry has cause to be proud of its achievements in 1974. Its performance as a supplier of equipment to the military services, manufacturing partner in the national space program and spearhead of American technological advance, places it in the forefront of industrial efforts in the national interest.

The statistical information on the pages that follow presents a comprehensive account of a major industry's effort in a year of historical import. We trust that government and industry officials, news writers and editors, legislators, analysts and students will find this 23rd edition of *Aerospace Facts and Figures* both useful and interesting.

Karl G. Harr, Jr.
President
Aerospace Industries Association

Aerospace Summary

For the aerospace industry, 1974 was a paradoxical year. The account books registered gains in sales, income and backlog. Still, there was a decline in terms of real output as the year's double-digit inflation distorted the true picture of the industry's performance.

Aerospace recorded total sales of $26.3 billion, up $1.5 billion over 1973. Backlog at year-end reached $35.8 billion, which compares with $29.7 billion at the end of 1973. Profits as a percent of sales were 3 percent, better than any year since 1969 but still significantly below the average for all manufacturing industries, 5.4 percent.

In terms of constant dollars, the industry experienced a slight downturn rather than the indicated gain. Generally speaking, declines were in major product areas funded by the government. Principal gains were in non-government sales, particularly civil jet transports, and non-aerospace products and services.

Following is a breakdown of industry performance by major category:

OVERALL SALES Translated into constant dollars (1958 = 100), the $26.3 billion in aerospace sales for 1974 represents a "real" level of about $15 billion, approximately the level of the three preceding years. Aerospace sales as a percent of the gross national product (GNP) amounted to 1.9 percent, the same as the previous year but far below the rates of the sixties.

CIVIL AIRCRAFT PRODUCTION Units built in 1974 totaled 15,325 compared with 14,709 in the previous year. In terms of dollar volume, the great bulk of the sales was in jetliners, which accounted for a record level $4 billion, up more than $200 million from 1973. There was a comparable increase in the number of jet transports delivered: 332 in 1974, up from 294 in 1973.

Production of general aviation airplanes continued to climb to 14,165 units with a total value of $908 million, an all-time high. The comparable figures for 1973 were 13,645 planes worth $826 million.

Manufacture of civil helicopters also reached a new peak. Output in 1974 was 828 rotary-wing craft valued at $189 million compared with 770 and $121 million in 1973.

MILITARY AIRCRAFT PRODUCTION Department of Defense (DOD) outlays for aircraft actually decreased slightly, from $7.1 billion in fiscal year (FY) 1973 to $6.9 billion in FY 1974. This drop continued the downward trend beginning in 1967 in the number of aircraft delivered to the military. Aircraft built in 1974 are estimated at 1,000 units, the lowest figure in a quarter of a century.

MISSILES At $5.19 billion, industry sales in the missile category almost exactly matched those of the previous year ($5.18 billion). Adjusted for inflation, the 1974 figure represented a substantial decline in weapon acquisition.

SPACE PROGRAMS Space systems accounted for slightly more than $3 billion of the year's total aerospace sales. Funding for space was up slightly from the previous year, partially due to the fact that the National Aeronautics and Space Administration (NASA) was engaged in three separate manned space programs during the year. The first, Skylab, was in effect only during the first two months of 1974. The second, Apollo-Soyuz, involved preparations for a single flight scheduled for mid-1975 and represented a relatively small effort compared with previous Apollo hardware projects. The third, the Space Shuttle, was in early development and funding levels were well below expectations.

Also, there was an increase in military astronautics activity as the armed services stepped up work on a variety of unmanned satellite applications for defense support. Outlays for military astronautics climbed from $512 million in FY 1973 to an estimated $560 million in FY 1974.

RESEARCH AND DEVELOPMENT Industry research and development (R&D) activity, in current dollars, remained at approximately the level of the earlier years of the decade. Aerospace R&D outlays of DOD—traditionally the principal source of industry R&D contracts—were up negligibly: $4.61 billion as compared with $4.59 billion in the previous year. Adjusted for inflation, the funding bought less research effort. The largest expenditures for defense R&D were in the missile category, $2.2 billion. Aircraft R&D outlays amounted to $1.9 billion.

EXPORTS Aerospace exports made a significant contribution to the balance of trade in 1974. Having set an all-time record in 1973 with export sales totaling $5.1 billion, the industry improved substantially on that performance in 1974, posting a $2 billion increase. The total value of aerospace products exported in 1974 was $7.1 billion, while aerospace imports amounted to only $745 million, thus producing an aerospace trade surplus of $6.4 billion. The main contribution to the trade balance came from sales abroad of American-built jetliners—228 planes worth $2.7 billion.

EMPLOYMENT Where national employment declined for the most part in 1974, the aerospace industry registered a slight gain. Average employment was 965,000 employees, up from 948,000 in the previous year. The gain was not indicative of an upward trend, but rather of temporary fluctuations in industry workload. A decline to near 1973 levels is forecast for 1975.

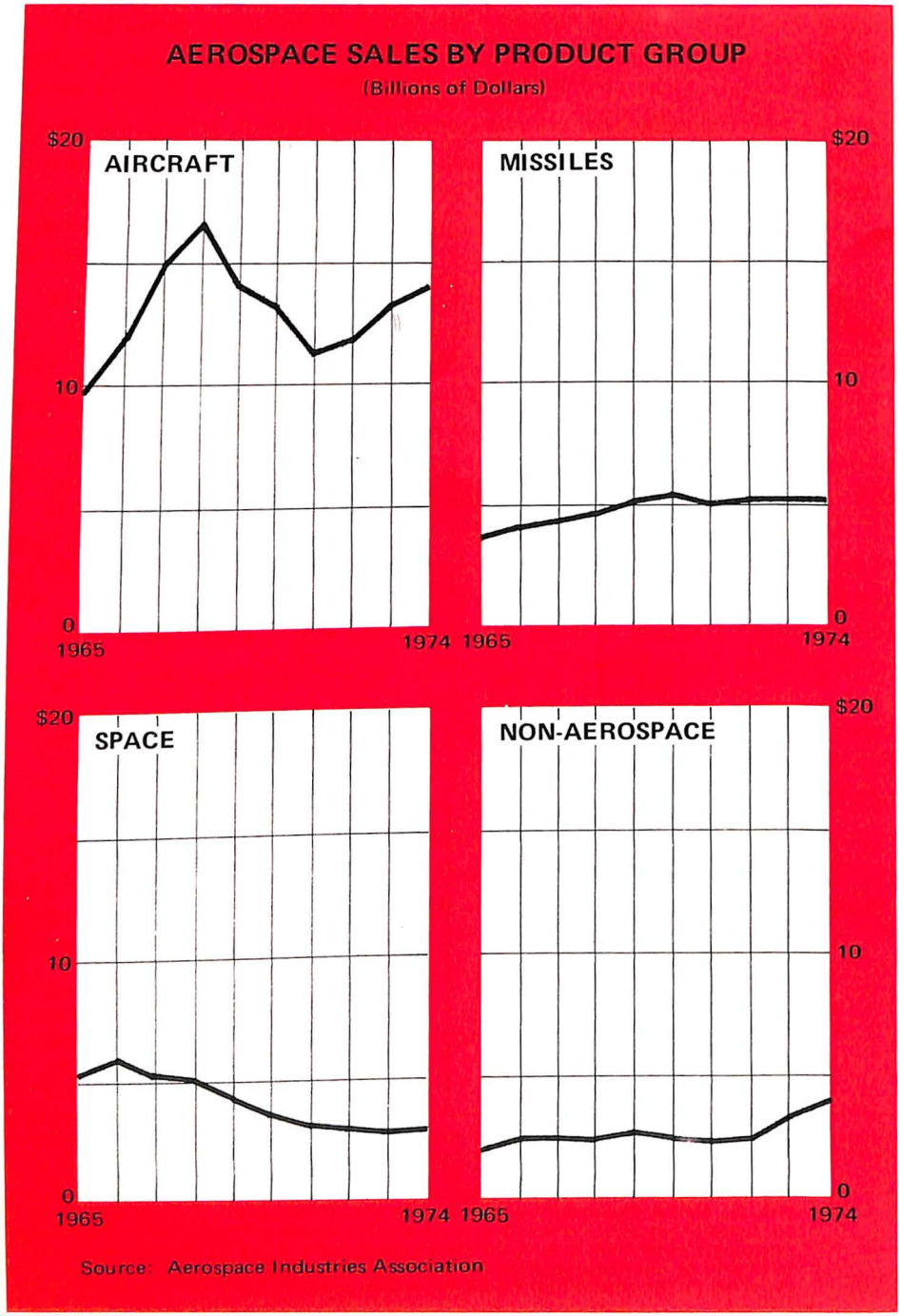
AIR TRANSPORTATION The airline segment of the aviation/space community experienced an unusual year due primarily to a worldwide recession and the fuel crisis. Nevertheless, the world's airlines approached the 400 billion mark in passenger miles flown and, with higher fares in effect, set new records for revenues and profits. The United States scheduled airlines, despite losses in international traffic, had the fourth best year in their history in terms of profits.

AEROSPACE INDUSTRY SALES BY CUSTOMER

Calendar Years 1950 to Date
(Millions of Dollars)

Year	TOTAL Sales	Aerospace Products and Services			Non-Aerospace Products and Services
		Government		Non-Government	
		Department of Defense	NASA and Other Agencies		
1950	$ 3,116	$ 2,598	$ –	$ 238	$ 280
1951	6,264	5,353	–	347	564
1952	10,130	8,568	–	650	912
1953	12,459	10,604	–	734	1,121
1954	12,807	10,832	–	822	1,153
1955	12,411	10,508	–	786	1,117
1956	13,946	11,525	–	1,166	1,255
1957	15,858	12,833	–	1,598	1,427
1958	16,065	13,246	1	1,372	1,446
1959	16,640	13,171	130	1,841	1,498
1960	17,326	13,196	363	2,208	1,559
1961	17,997	13,871	630	1,876	1,620
1962	19,162	14,331	1,334	1,772	1,725
1963	20,134	14,191	2,628	1,485	1,830
1964	20,594	13,218	3,635	2,020	1,721
1965	20,670	11,396	4,490	2,816	1,968
1966	24,610	13,284	5,026	3,663	2,637
1967	27,267	15,855	4,201	4,632	2,579
1968	28,959	16,573	3,920	5,917	2,549
1969	26,126	15,771	3,314	4,342	2,699
1970	24,930	14,643	3,000	4,643	2,644
1971	22,186	12,584	2,777	4,302	2,523
1972[r]	22,816	13,295	2,606	4,269	2,646
1973[r]	24,808	12,886	2,393	6,186	3,343
1974	26,286	12,650	2,527	7,076	4,033

Source: Aerospace Industries Association estimates, based on latest available information.
NOTE: The AIA estimate of Aerospace Industry Sales is arrived at by adding 1. DOD-expenditures for "procurement" of aircraft and missiles, 2. DOD expenditures for research, development, test and evaluation for aircraft, missiles, and astronautics, 3. NASA expenditures for research and development, 4. AEC expenditures for space propulsion systems and space electric power development, 5. Net sales to customers other than U.S. Government by approximately 55 aerospace companies (adjusted to eliminate duplication by subcontracting) and 6. Non-aerospace sales reported by the approximately 55 aerospace companies reporting to the Bureau of Census.
r Revised.

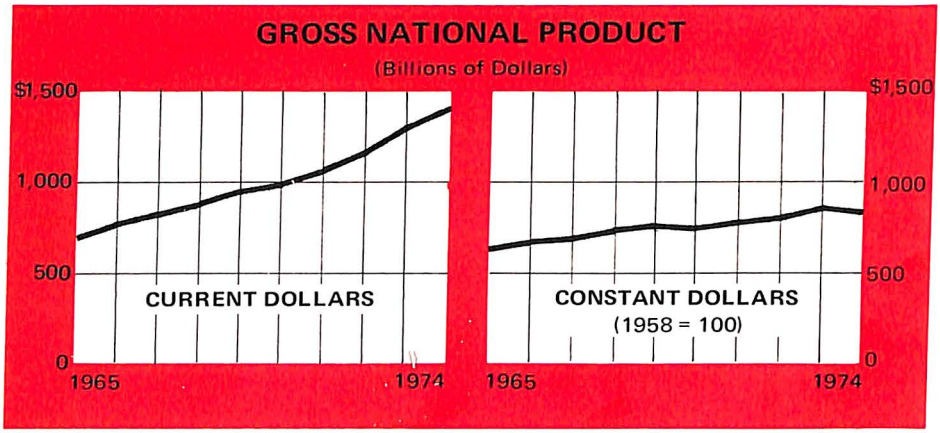

AEROSPACE SALES BY PRODUCT GROUP
(Billions of Dollars)
AIRCRAFT
$20
10
0
1965
1974
MISSILES
$20
10
0
1965
1974
SPACE
$20
10
0
1965
1974
NON-AEROSPACE
$20
10
0
1965
1974
Source: Aerospace Industries Association

AEROSPACE INDUSTRY SALES BY PRODUCT GROUP

Calendar Years 1950 to Date
(Millions of Dollars)

Year	TOTAL Sales	Product Group			
		Aircraft	Missiles	Space Vehicles	Non-Aerospace
1950	$ 3,116	$ 2,731	$ 105	$ –	$ 280
1951	6,264	5,067	633	–	564
1952	10,130	8,442	776	–	912
1953	12,459	10,420	918	–	1,121
1954	12,807	10,460	1,194	–	1,153
1955	12,411	9,781	1,513	–	1,117
1956	13,946	10,485	2,206	–	1,255
1957	15,858	11,398	3,033	–	1,427
1958	16,065	10,582	4,036	1	1,446
1959	16,640	9,714	5,042	386	1,498
1960	17,326	9,127	5,762	878	1,559
1961	17,997	8,847	6,266	1,264	1,620
1962	19,162	8,944	6,311	2,182	1,725
1963	20,134	8,527	6,003	3,774	1,830
1964	20,594	8,911	5,242	4,720	1,721
1965	20,670	9,747	3,626	5,329	1,968
1966	24,610	11,951	4,053	5,969	2,637
1967	27,267	14,981	4,417	5,290	2,579
1968	28,959	16,578	4,719	5,113	2,549
1969	26,126	14,097	5,058	4,272	2,699
1970	24,930	13,293	5,379	3,614	2,644
1971	22,186	11,442	5,018	3,203	2,523
1972[r]	22,816	11,866	5,217	3,087	2,646
1973[r]	24,808	13,338	5,177	2,950	3,343
1974	26,286	13,970	5,187	3,096	4,033

Source: Aerospace Industries Association estimates, based on latest available information.
NOTE: For explanation of "Aerospace Sales" see "NOTE" on page 9.
r Revised.



AEROSPACE SALES AND THE NATIONAL ECONOMY

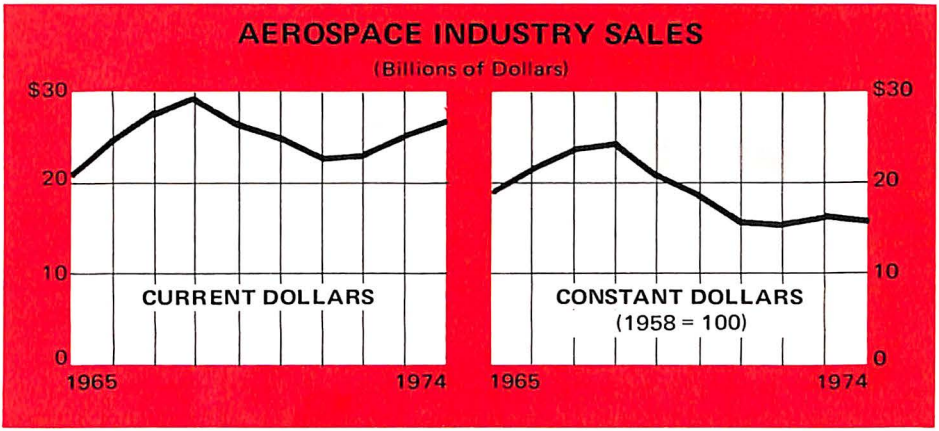
Calendar Years 1960 to Date
(Billions of Dollars)

Year	TOTAL Gross National Product	Sales			Aerospace Sales as Percent of		
		Manufacturing Industries	Durable Goods Industry	Aerospace Industry	GNP	Manufacturing Industries	Durable Goods Industry
1960	$ 503.7	$ 368.7	$ 189.5	$ 17.3	3.4%	4.7%	9.1%
1961	520.1	370.7	186.5	18.0	3.5	4.9	9.7
1962	560.3	397.4	205.2	19.2	3.4	4.8	9.4
1963	590.5	420.4	219.0	20.1	3.4	4.8	9.2
1964	632.4	448.0	235.6	20.6	3.3	4.6	8.7
1965	684.9	492.0	266.6	20.7	3.0	4.2	7.8
1966	747.6	538.4	295.6	24.6	3.3	4.6	8.3
1967	793.5	557.4	302.5	27.3	3.4	4.9	9.0
1968	864.2	603.4	332.3	29.0	3.4	4.8	8.7
1969	930.3	642.7	353.5	26.1	2.8	4.1	7.4
1970	976.4	630.7	336.7	24.9	2.6	3.9	7.4
1971[r]	1,054.9	667.0	358.6	22.2	2.1	3.3	6.2
1972[r]	1,158.0	744.2	401.3	22.8	2.0	3.0	5.6
1973[r]	1,294.9	856.8	464.7	24.8	1.9	2.9	5.3
1974	1,397.3	982.9	513.3	26.3	1.9	2.7	5.1

Source: Gross National Product, Manufacturing and Durable Goods Industries: Department of Commerce, "Survey of Current Business," (Monthly). Aerospace: Aerospace Industries Association estimates, based on latest available information.

NOTE: For explanation of "Aerospace Sales" see "NOTE" on page 9.

r Revised.



AEROSPACE SALES AND THE NATIONAL ECONOMY IN CONSTANT DOLLARS

Calendar Years 1960 to Date
(Billions of 1958 Dollars)

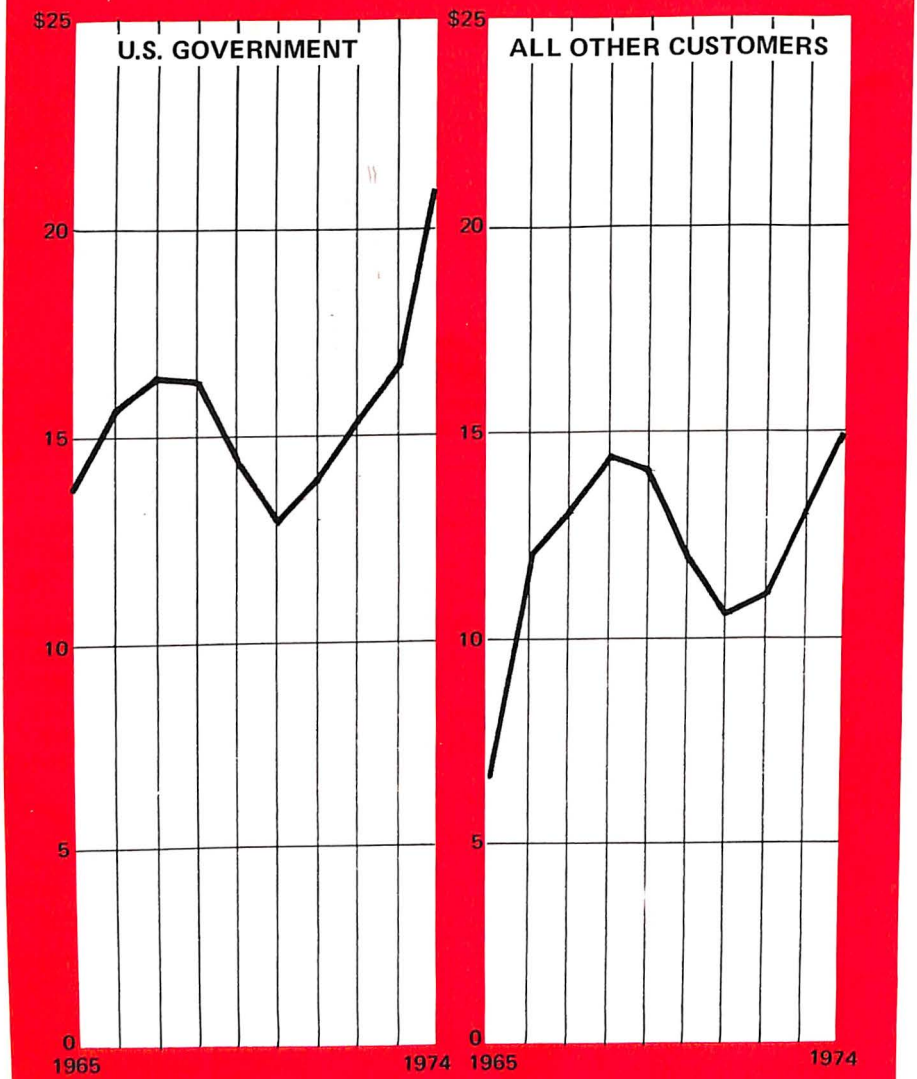
Year	TOTAL Gross National Product	Sales			Deflator Series 1958 = 100
		Manufacturing Industries	Durable Goods Industry	Aerospace Industry	
1960	$ 487.7	$ 356.9	$ 183.5	$ 16.7	$ 103.29
1961	497.2	354.3	178.3	17.2	104.62
1962	529.8	375.7	194.0	18.2	105.78
1963	551.0	392.3	204.3	18.8	107.17
1964	581.1	411.6	216.4	18.9	108.85
1965	617.8	443.8	240.5	18.7	110.86
1966	658.1	472.5	259.4	21.6	113.94
1967	675.2	474.0	257.2	23.2	117.59
1968	706.6	493.4	271.7	23.7	122.30
1969	725.6	501.3	275.7	20.4	128.20
1970	722.5	466.4	249.0	18.4	135.24
1971	746.3	471.9	253.7	15.7	141.35
1972	792.5	509.3	274.6	15.5	146.12
1973	839.2	555.2	301.1	16.1	154.31
1974	821.1	577.6	301.6	15.4	170.17

Source: Gross National Product, Manufacturing and Durable Goods Industries: Department of Commerce, "Survey of Current Business," (Monthly). Aerospace: Aerospace Industries Association estimates, based on latest available information. Deflator Series: "Economic Report of the President," February 1975.

BACKLOG OF AEROSPACE COMPANIES

(As of December 31)

(Billions of Dollars)



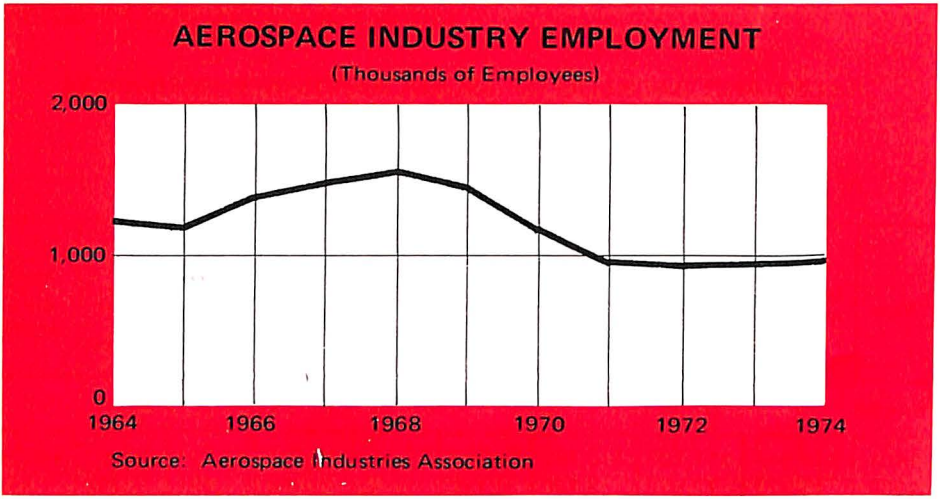
Source: Bureau of the Census

SALES AND BACKLOG OF MAJOR AEROSPACE COMPANIES BY PRODUCT GROUP

1961 to Date
(Millions of Dollars)

Year	GRAND TOTAL	TOTAL		Aircraft and Engines		Missiles & Space Incl. Propulsion	Other Aerospace		Non-Aerospace
		U.S. Gov't.	Other	U.S. Gov't.	Other		U.S. Gov't.	Other	
SALES									
1961	$14,948	$11,766	$ 3,182	$3,967	$1,888	$5,187	$1,824	$ 852	$1,230
1962	15,972	12,552	3,420	4,128	1,772	6,078	1,791	762	1,441
1963	16,407	13,203	3,204	4,158	1,459	6,904	1,611	682	1,593
1964	16,686	12,815	3,871	4,568	1,863	6,381	1,418	735	1,721
1965	17,016	12,535	4,481	4,525	2,532	5,819	1,413	759	1,968
1966	20,227	14,530	5,697	5,458	3,267	6,241	1,755	869	2,637
1967	23,444	16,334	7,110	7,141	4,753	6,054	1,914	1,002	2,580
1968	25,592	16,635	8,957	7,411	6,439	6,076	2,077	1,040	2,549
1969	24,648	16,560	8,088	7,161	5,603	5,660	2,539	986	2,699
1970	24,752	16,407	8,345	7,586	5,880	5,422	2,324	896	2,644
1971	21,679	14,114	7,565	6,313	5,079	4,971	1,909	884	2,523
1972	21,499	13,492	8,007	4,954	5,199	5,598	2,067	1,035	2,646
1973[r]	24,305	14,431	9,874	5,539	6,739	5,580	2,103	1,001	3,343
1974	26,768	15,286	11,482	6,068	7,436	5,838	2,128	1,265	4,033
BACKLOG - AS OF DECEMBER 31									
1961	$13,922	$11,018	$ 2,904	$5,056	$2,136	$3,836	$1,391	$ 390	$1,113
1962	13,138	10,572	2,566	4,900	1,672	4,056	992	488	1,030
1963	13,904	10,950	2,954	4,924	1,887	4,646	837	458	1,152
1964	15,188	11,651	3,537	5,282	2,515	4,556	913	492	1,430
1965	20,385	13,731	6,654	6,107	5,281	5,480	1,294	562	1,661
1966	27,547	15,711	11,836	8,761	9,718	4,510	1,588	904	2,066
1967	29,339	16,397	12,972	20,628[a]		5,704	1,712	917	1,761
1968	30,749	16,343	14,406	8,150	12,409	5,083	1,851	983	2,273
1969	28,297	14,298	13,999	7,089	12,099	4,338	2,001	880	1,890
1970	24,705	12,882	11,823	5,913	9,800	4,522	1,986	805	1,679
1971	24,579	13,997	10,582	6,221	8,059	4,780	2,232	1,042	2,245
1972	26,922	15,322	11,600	7,027	8,605	5,272	2,018	972	3,028
1973[r]	29,661	16,695	12,966	7,815	8,550	5,670	1,819	1,078	4,729
1974	35,770	20,909	14,861	9,805	9,606	6,885	1,958	1,667	5,849

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).
NOTE: Based on reports from about 55 aerospace companies.
a Of this amount, orders of aircraft by the U.S. Government are $7,071 million; by other customers are $9,306 million. Total engine sales are $4,251 million.
r Revised.



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

Calendar Years 1961 to Date
(Thousands of Employees)

Year	All Manufacturing Industries	Durable Goods Industries	Aerospace Industry		
			TOTAL	As Percent of	
				All Manufacturing	Durable Goods
1961	16,326	9,070	1,178	7.2%	13.0%
1962	16,853	9,480	1,270	7.5	13.4
1963	16,995	9,616	1,267	7.5	13.2
1964	17,274	9,816	1,209	7.0	12.3
1965	18,062	10,406	1,175	6.5	11.3
1966	19,214	11,284	1,375	7.2	12.2
1967	19,447	11,439	1,484	7.6	13.0
1968	19,781	11,626	1,502	7.6	12.9
1969	20,167	11,895	1,402	7.0	11.8
1970	19,349	11,195	1,166	6.0	10.4
1971	18,529	10,565	951	5.1	9.0
1972	18,933	10,884	922	4.9	8.5
1973	19,820	11,633	948	4.8	8.1
1974	20,016	11,837	965	4.8	8.2

Sources: Manufacturing and Durable Goods: Bureau of Labor Statistics, "Employment and Earnings" (Monthly); Aerospace: Aerospace Industries Association estimates based on latest available information.

NOTE: Aerospace employment as shown is the sum of the estimated monthly average employment in the aircraft and missile and space industries (SIC 372 and 1925) plus estimated aerospace employment in the communications equipment (SIC 3662) and instruments (SIC 3811 and 3821) industries and in certain other industries (SIC 28, 35, 73, 89, etc.).

AEROSPACE INDUSTRY AND ALL MANUFACTURING INDUSTRIES

Annual Average Employment and Payroll
Calendar Years 1961 to Date

Year	All Manufacturing Industries TOTAL	Aerospace			Aerospace as Percent of All Manufacturing
		TOTAL	Production Workers	Other	
EMPLOYMENT—Thousands of Employees					
1961	16,326	1,178	612	566	7.2%
1962	16,853	1,270	635	635	7.5
1963	16,995	1,267	625	642	7.5
1964	17,274	1,209	600	609	7.0
1965	18,062	1,175	597	578	6.5
1966	19,214	1,375	731	644	7.2
1967	19,447	1,484	804	680	7.6
1968	19,781	1,502	807	695	7.6
1969	20,167	1,402	746	656	7.0
1970	19,349	1,166	604	562	6.0
1971	18,529	951	480	471	5.1
1972	18,933	922	453	469	4.9
1973	19,820	948	475	473	4.8
1974	20,016	965	478	487	4.8
PAYROLL—Millions of Dollars					
1961	$ 89,800	$ 9,140	$ 4,342	$ 4,798	10.1%
1962	96,700	10,232	4,871	5,361	10.5
1963	100,600	10,173	4,588	5,585	10.1
1964	107,200	10,067	4,563	5,504	9.4
1965	115,600	10,188	4,504	5,684	8.8
1966	128,100	12,139	5,641	6,498	9.4
1967	134,200	13,727	6,382	7,345	10.2
1968	145,900	14,397	6,582	7,815	9.9
1969	157,600	14,649	6,401	8,248	9.3
1970	158,300	12,275[r]	5,322	6,953	7.8
1971	160,500[r]	10,480[r]	4,409	6,071	6.5
1972	175,800[r]	11,197[r]	4,565	6,632	6.4
1973	196,600[r]	12,257[r]	5,114	7,143	6.2
1974	211,300	13,250	5,454	7,796	6.3

Sources: Aerospace Employment and Payroll: Aerospace Industries Association estimates, based on latest available information; Manufacturing Employment: Bureau of Labor Statistics, "Employment and Earnings" (Monthly); Manufacturing Payroll: Bureau of Economic Analysis.

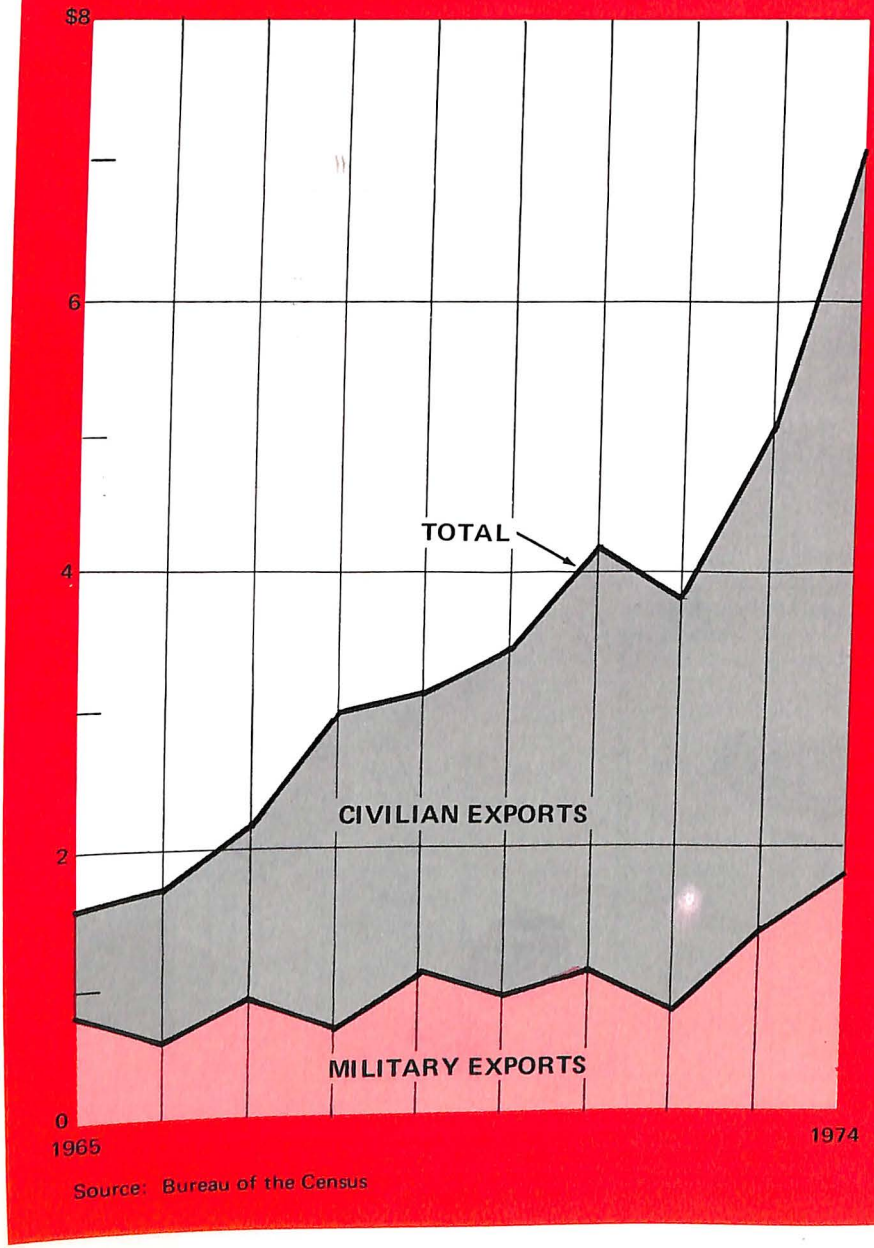
a For a description of Aerospace Employment and Payroll see "NOTE," page 16.

b "Other" employment includes salaried, clerical and maintenance employees, among others.

r Revised.

EXPORTS OF AEROSPACE PRODUCTS

(Billions of Dollars)



Source: Bureau of the Census

U.S. EXPORTS AND EXPORTS OF AEROSPACE PRODUCTS

Calendar Years 1960 to Date
(Millions of Dollars)

Year	TOTAL Exports of U.S. Merchandise	Exports of Aerospace Products				
		TOTAL	Percent of Total U.S. Exports	Civil		Military
				Transports	Other	
1960	$ 20,375	$ 1,726	8.5%	$ 480	$ 609	$ 637
1961	20,754	1,653	8.0	263	615	773
1962	20,431	1,923	9.4	259	651	1,013
1963	23,062	1,627	7.1	191	541	895
1964	26,156	1,608	6.1	211	553	844
1965	27,127	1,618	6.0	353	501	764
1966	29,884	1,673	5.6	421	614	638
1967	31,142	2,248	7.2	611	769	868
1968	34,199	2,994	8.8	1,200	1,089	705
1969	37,462	3,138	8.4	947	1,080	1,111
1970[r]	42,590	3,405	8.0	1,283	1,233	889
1971[r]	43,492	4,203	9.7	1,567	1,513	1,123
1972[r]	48,959	3,795	7.8	1,119	1,835	841
1973[r]	70,246	5,142	7.3	1,664	2,124	1,354
1974	97,144	7,101	7.3	2,661	2,618	1,822

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity and Country," Report FT 410 (Monthly); Bureau of the Census, "Highlights of U.S. Export and Import Trade," Report FT 990 (Monthly).

NOTE: Several changes have been made in this series over the years so that data for years after 1960 are not strictly comparable with earlier years.

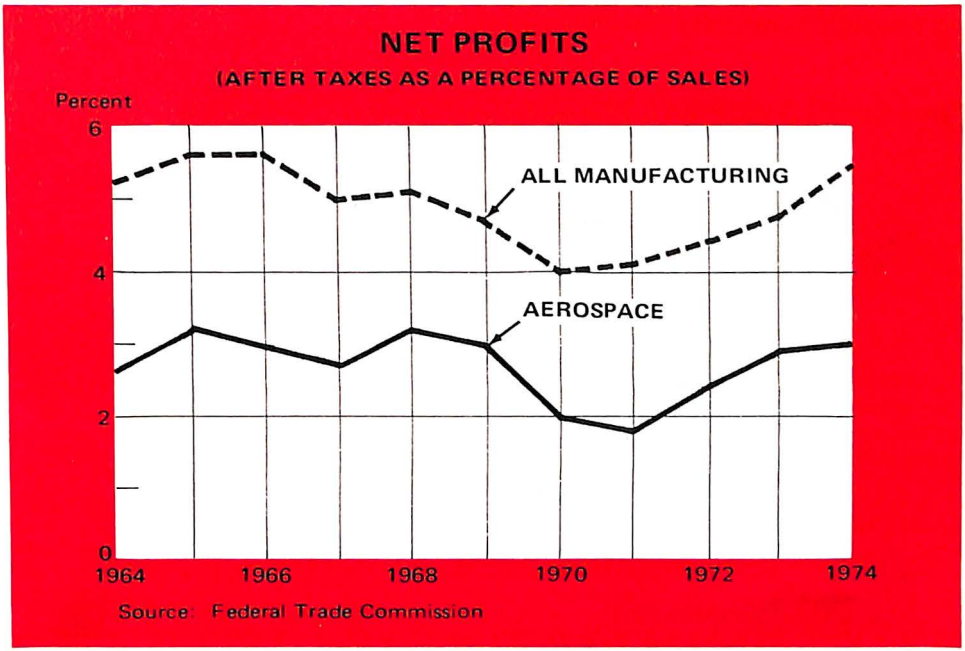
r Revised.

U. S. MANUFACTURED TRANSPORT AIRCRAFT

In Operation on World Civil Airlines
Calendar Years 1960 to Date

Year	TOTAL AIRCRAFT IN OPERATION	Number Manufactured in the United States	Percent Manufactured in the United States
1960	3,376	2,766	81.9%
1961	3,319	2,542	76.6
1962	3,162	2,345	74.2
1963	3,086	2,266	73.4
1964	3,137	2,317	73.9
1965	3,461	2,548	73.6
1966	3,541	2,556	72.2
1967	3,725	2,735	73.4
1968	3,903	2,890	74.0
1969	3,999	3,030	75.8
1970	3,983	3,042	76.4
1971	3,973	3,094	77.9
1972[r]	4,097	3,247	79.3
1973	4,225	3,310	78.3

Source: International Air Transport Association, "World Air Transport Statistics" (Annually).
NOTE: Excludes U.S.S.R., People's Republic of China and non-IATA members.
r Revised.



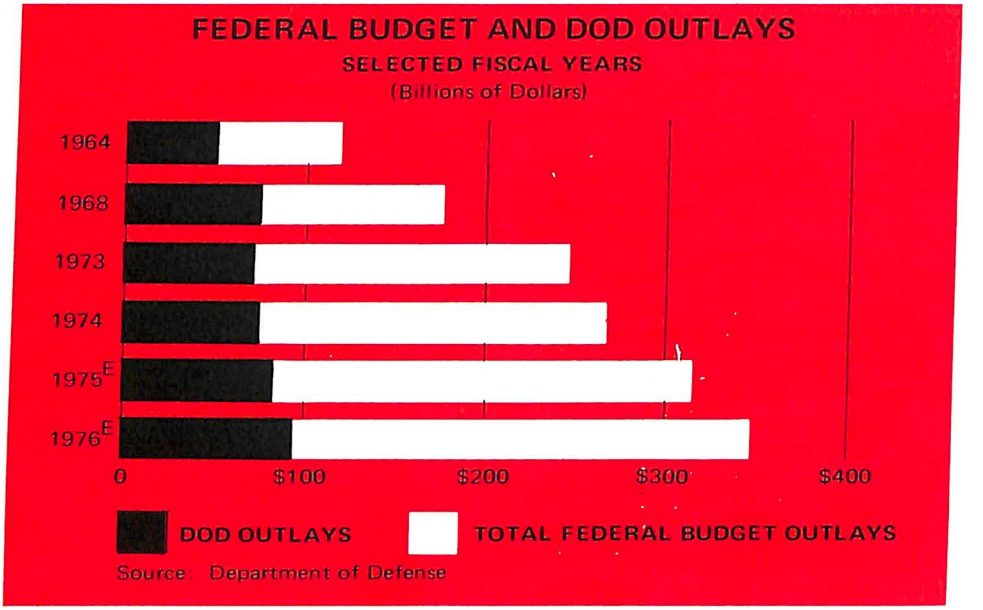
NET PROFIT AFTER TAXES AS A PERCENT OF SALES FOR MANUFACTURING CORPORATIONS

Calendar Years 1960 to Date

Year	All Manufacturing Corporations[a]	Non-Durable Goods	Durable Goods	Aerospace
1960	4.4%	4.8%	4.0%	1.4%
1961	4.3	4.7	3.9	1.8
1962	4.5	4.7	4.4	2.4
1963	4.7	4.9	4.5	2.3
1964	5.2	5.4	5.1	2.6
1965	5.6	5.5	5.7	3.2
1966	5.6	5.5	5.6	3.0
1967	5.0	5.3	4.9	2.7
1968	5.1	5.3	4.9	3.2
1969	4.8	5.0	4.6	3.0
1970	4.0	4.5	3.6	2.0
1971	4.1	4.5	3.8	1.8
1972	4.4	4.6	4.3	2.4
1973	4.7	5.0	4.5	2.9
1974	5.4	6.4	4.7	3.0

Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations."

a Does not include newspapers.



DEFENSE BUDGET, FEDERAL BUDGET, AND GNP

Selected Fiscal Years[a]
(Billions of Dollars)

Year		GNP	Federal Budget Outlays			DOD Outlays as Percent of	
			NET TOTAL[b]	DOD	Others	GNP	Federal Budget
1950	Lowest defense budget since World War II peak	$ 263.3	$ 43.1	$ 12.0	$ 32.8	4.5%	26.8%
1953	Korea peak	358.9	76.8	47.5	31.3	13.3	60.3
1964	Last prewar year	612.2	118.6	50.8	70.7	8.3	41.8
1968	South East Asia peak	826.1	178.8	78.0	105.3	9.4	42.5
1973	Actual year	1,220.0	246.5	73.8	181.1	6.0	29.0
1974	Last actual year	1,348.9	268.4	78.4	199.9	5.8	28.2
1975	Current estimate	1,434.1	313.4	84.8	240.4	5.9	26.1
1976	Budget estimate	1,595.6	349.4	92.8	268.8	5.8	25.7

Source: Department of Defense, Budget Press Release, OASD (Comptroller) February 3, 1975.

a Fiscal Years ending June 30.

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

FEDERAL OUTLAYS
SELECTED FUNCTIONS AND AEROSPACE PRODUCTS & SERVICES

Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	TOTAL National Defense	TOTAL NASA	Federal Outlays for AEROSPACE Products & Services			AERO-SPACE as Percent of Total National Defense and NASA
			TOTAL	DOD	NASA	
1960	$ 45,691	$ 401	$ 12,849	$ 12,502	$ 347	27.9%
1961	47,494	744	13,606	12,960	646	28.2
1962	51,103	1,257	15,135	13,992	1,143	28.9
1963	52,755	2,552	16,186	13,857	2,329	29.3
1964	53,591	4,171	17,938	14,205	3,733	31.1
1965	49,578	5,093	15,697	11,135	4,562	28.7
1966	56,785	5,933	17,771	12,411	5,360	28.3
1967	70,081	5,426	20,011	14,874	5,137	26.5
1968	80,517	4,724	21,355	16,757	4,598	25.1
1969	81,232	4,252	20,472	16,286	4,186	23.9
1970	80,295	3,753	18,747	15,048	3,699	22.3
1971	77,661	3,382	17,335	13,997	3,338	21.4
1972	78,336	3,423	16,999	13,627	3,372	20.8
1973	76,021	3,315	15,945	12,675	3,270	20.1
1974	78,569	3,256	15,744	12,563	3,181	19.2
1975[E]	85,276	3,207	N.A.	N.A.	3,107	N.A.
1976[E]	94,027	3,498	N.A.	N.A.	3,390	N.A.

Source: "The Budget of the United States Government" (Annually).
NOTE: "National Defense" includes the military budget of the Department of Defense and atomic energy defense activities. "Total NASA" includes research and development activities, administrative operations and construction of facilities. NASA construction is not included in "Total Aerospace Products and Services."
a Fiscal Years ending June 30.
E Estimate.
N.A. Not available.

FEDERAL GOVERNMENT OUTLAYS FOR AEROSPACE PRODUCTS AND SERVICES

Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	TOTAL	Department of Defense				NASA
		TOTAL	Aircraft	Missiles	Astro-nautics	
1960	$ 12,849	$ 12,502	$ 6,904	$ 5,086	$ 512	$ 347
1961	13,606	12,960	6,445	5,997	518	646
1962	15,135	13,992	7,024	6,219	749	1,143
1963	16,186	13,857	6,853	6,058	946	2,329
1964	17,938	14,205	6,992	5,929	1,284	3,733
1965	15,697	11,135	6,217	3,997	921	4,562
1966	17,771	12,411	7,611	3,870	930	5,360
1967	20,011	14,874	9,459	4,432	983	5,137
1968	21,355	16,757	10,829	4,707	1,221	4,598
1969	20,472	16,286	10,208	4,919	1,159	4,186
1970	18,747	15,048	9,187	5,108	753	3,699
1971	17,335	13,997	8,330	5,148	519	3,338
1972	16,999	13,627	7,993	5,166	468	3,372
1973	15,945	12,675	7,102	5,061	512	3,270
1974	15,782	12,601	6,899	5,141	561	3,181

Source: Department of Defense, Budget Press Briefing, February 3, 1975.
NASA, Budget Briefing, February 3, 1975.

a Fiscal Years ending June 30.

FEDERAL GOVERNMENT BUDGET AUTHORITY FOR AEROSPACE PRODUCTS AND SERVICES

Fiscal Years[a] 1962 to Date
(Millions of Dollars)

Year	TOTAL	Department of Defense				NASA
		TOTAL	Aircraft	Missiles	Astro-nautics	
1962	$ 14,874	$ 13,077	$ 6,591	$ 5,604	$ 882	$ 1,797
1963	17,738	14,112	6,499	6,415	1,198	3,626
1964	19,059	14,013	6,649	6,107	1,257	5,046
1965	17,632	12,464	7,025	4,550	889	5,168
1966	20,178	15,083	10,463	3,541	1,079	5,095
1967	21,191	16,329	10,737	4,650	942	4,862
1968	21,034	16,581	10,641	4,897	1,043	4,453
1969	18,350	14,528	7,593	5,863	1,072	3,822
1970	17,945	14,082	8,005	5,439	638	3,863
1971	17,138	13,826	7,998	5,366	462	3,312
1972	17,309	14,006	8,414	5,203	389	3,303
1973	16,550	13,222	7,579	5,236	407	3,328
1974	16,056	13,001	7,606	4,805	590	3,055
1975[E]	15,961	12,873	7,696	4,653	524	3,088
1976[E]	20,011	16,557	10,138	5,794	625	3,454
Tr. Qtr.[E]	4,672	3,728	2,275	1,308	145	944

Source: Department of Defense, Budget Press Briefing, February 3, 1975. NASA, "The Budget of the United States Government" (Annually).
NOTE: Excludes transfers from stock funds beginning with 1969.
Tr. Qtr: Transition Quarter. Beginning with the 1977 Federal Budget, the fiscal year will run from October 1 through September 30. To facilitate the conversion, a three-month transition period has been provided between fiscal years 1976 and 1977 as a separate accounting period belonging to neither year.
a Fiscal Years ending June 30.
E Estimate.

DEPARTMENT OF DEFENSE
TOTAL OUTLAYS BY FUNCTIONAL TITLE

Fiscal Years[a] 1968 to Date
(Millions of Dollars)

	1968	1969	1970
TOTAL	$ 78,027	$ 78,666	$ 77,880
PROCUREMENT—TOTAL	23,283	23,988	21,585
AIRCRAFT	9,462	9,177	7,948
MISSILES	2,219	2,509	2,912
Ships	1,356	1,949	2,066
Combat Vehicles, Weapons & Torpedoes	738	(b)	647
Ordnance, Vehicles & Related Equipment	5,709	6,590	4,973
Electronics & Communications	1,595	1,409	1,182
Other Procurement	2,204	2,354	1,857
RESEARCH, DEVELOPMENT, TEST & EVALUATION—TOTAL	7,747	7,459	7,166
AIRCRAFT	1,367	1,031	1,239
MISSILES	2,488	2,410	2,196
ASTRONAUTICS	1,221	1,159	753
Other	2,671	2,859	2,978
Military Personnel—TOTAL	21,954	23,828	25,880
Active Forces	18,988	20,478	21,977
Reserve Forces	871	907	1,054
Retired Pay	2,095	2,443	2,849
Military Assistance	601	686	609
Military Construction	1,281	1,389	1,168
Family Housing	495	572	614
Civil Defense	108	87	80
Operations and Maintenance	20,578	22,285	21,609
Other	1,980	(1,628)	(831)

Source: Department of Defense, FAD 748; Budget Press Briefing, February 3, 1975.
NOTE: Data in parentheses are credit figures.
The categories printed in capital letters are primarily aerospace, but others contain substantial parts attributable to aerospace activities.
For an explanation of the Transition Quarter, see page 25.

a Fiscal Years ending June 30.
b Amount included in entry for "Ordnance, Vehicles & Related Equipment."
E Estimate.
N.A. Not Available.

DEPARTMENT OF DEFENSE
TOTAL OUTLAYS BY FUNCTIONAL TITLE (Continued)

Fiscal Years[a] 1968 to Date
(Millions of Dollars)

1971	1972	1973	1974	1975[E]	1976[E]	Transition Quarter[E]
$ 75,545	$ 75,957	$ 73,828	$ 78,445	$ 84,800	$ 92,800	$ 25,400
18,858	17,131	15,654	15,241	14,785	16,510	4,700
6,631	5,927	5,066	5,006			
3,140	3,009	3,023	2,981			
2,114	1,978	1,982	2,104			
545	491	354	446	N.A.	N.A.	N.A.
3,586	3,040	2,508	2,044			
1,163	946	675	854			
1,679	1,740	2,046	1,806			
7,303	7,881	8,157	8,582	8,650	9,610	2,250
1,699	2,066	2,036	1,893			
2,008	2,157	2,038	2,160	N.A.	N.A.	N.A.
519	468	512	561			
3,077	3,190	3,571	3,968			
26,018	26,921	27,635	28,856	31,331	31,886	8,242
21,428	21,629	21,722	22,150	23,301	23,227	5,794
1,204	1,407	1,523	1,579	1,749	1,775	659
3,386	3,885	4,390	5,127	6,281	6,884	1,789
999	806	531	819	1,822	3,000	600
1,095	1,108	1,119	1,407	1,457	1,703	579
598	688	729	884	1,090	1,260	375
75	75	74	75	90	88	16
20,941	21,675	21,069	22,478	25,657	28,325	8,092
(342)	(328)	(1,140)	103	98	418	546

DEPARTMENT OF DEFENSE
AEROSPACE OUTLAYS

Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	DOD Aerospace Outlays[b]		
	TOTAL	Procurement	Research, Development, Test and Evaluation
1960	$ 12,502	$ 9,299	$ 3,203
1961	12,960	8,870	4,090
1962	13,992	9,842	4,150
1963	13,857	10,126	3,731
1964	14,205	9,630	4,575
1965	11,135	7,296	3,839
1966	12,411	8,704	3,707
1967	14,875	10,341	4,534
1968	16,757	11,681	5,076
1969	16,286	11,686	4,600
1970	15,048	10,860	4,188
1971	13,997	9,771	4,226
1972	13,627	8,936	4,691
1973	12,675	8,089	4,586
1974	12,601	7,987	4,614

Source: Department of Defense, OASD (Comptroller), FAD 748/74, June 30, 1974, and earlier reports.
a Fiscal Years ending June 30.
b Excludes Military Assistance.

ACTIVE MILITARY FORCES OF THE UNITED STATES

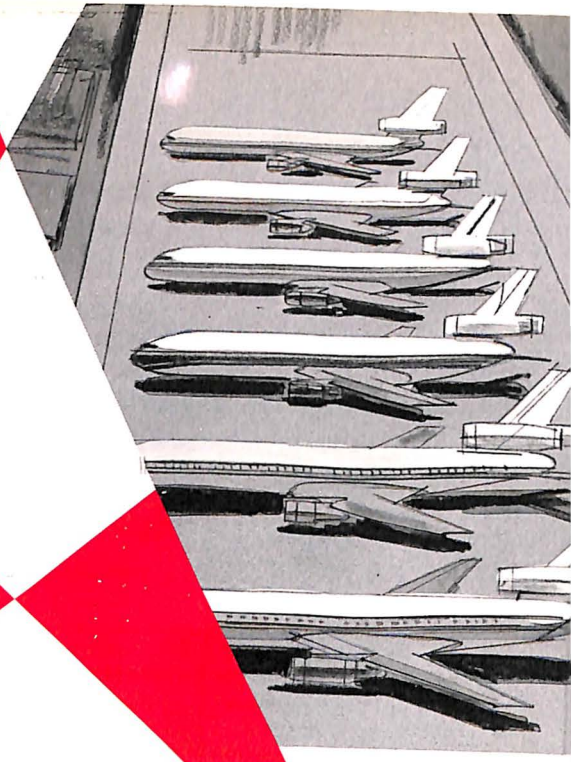
Selected Fiscal Years[a]

Description	Actual		Estimated	
	1964	1974	1975	1976
Military Personnel (in thousands):				
Army	972	783	785	785
Navy	667	546	536	529
Marine Corps	190	189	196	196
Air Force	856	644	612	590
TOTAL	2,685	2,161	2,129	2,100
Selected Military Forces:				
Strategic Forces:				
Intercontinental Ballistic Missiles:				
Minuteman	600	1,000	1,000	1,000
Titan II	108	54	54	54
Polaris-Poseidon Missiles	336	656	656	656
Strategic Bomber Squadrons	78	28	27[b]	26[b]
Manned Fighter Interceptor Squadrons	40	7	6	6
Army Air Defense Firing Batteries	107	21	—	—
General Purpose Forces:				
Army Divisions	16 1/3	13	14	16
Marine Corps Divisions	3	3	3	3
Air Force Wings	21	22	22	22
Navy Attack Wings	15	14	14	13
Marine Corps Wings	3	3	3	3
Attack & Antisubmarine Carriers	24	14	15	13
Nuclear Attack Submarines	19	61	64	68
Other Warships	370	187	189	185
Amphibious Assault Ships	133	65	64	63
Airlift & Sealift Forces:				
Aircraft Squadrons:				
C-5A	—	4	4	4
C-141	—	13	13	13
Troopships, Cargo Ships and Tankers	100	37	40	43

Source: Department of Defense, Budget Press Release, OASD (Comptroller), February 3, 1975.

a Fiscal Years ending June 30.

b Reflects reorganization, total number of strategic bombers remains the same.



Aircraft Production

As is traditionally the case, aircraft manufacturing—including engines, aircraft parts and related equipment—continued in 1974 as the major element of the aerospace industry's production effort.

At $13.5 billion, sales reached the highest level since the peak year of 1968 and accounted for more than half of the industry's total sales. The sales volume represented an increase of $1.2 billion over the previous year, reflecting for the most part the effects of inflation since output in terms of numbers was up only marginally.

For the third consecutive year, sales to non-government customers outstripped government-funded business $7.4 billion of $6.1 billion. A major factor in the dollar value upswing was sales of commercial jet transports. Demand from both U.S. and foreign airlines continued high for the U.S. family of jetliners. Jetliner deliveries totaled 332 airplanes, up from 294 in 1973. Sales for 1974

amounted to just under $4 billion, a $275 million increase over the previous year. Nearly one-third of the transports delivered were wide-bodied and they accounted for the bulk of the dollar volume.

Fuel costs and fuel availability in the early part of the year had a retarding influence on the continuing growth of the general aviation fleet. There was, however, substantial increase in the number of general aviation units delivered, although growth did not match the rates of recent years. General aviation shipments totaled 14,165 planes, up an even 500 units from 1973. Value of these shipments was $908 million, an all-time high compared with $826 million in 1973.

Production of civil helicopters also reached new highs. In 1974 the industry turned out 828 rotary-wing craft with a total value of $189 million compared with 1973 output of 770 helicopters worth $121 million.

Production of military aircraft continued to decline in 1974, a trend in evidence since 1967. In that peak year of the sixties, the military took delivery of 4,481 planes. The number declined to barely 3,000 in 1970, to less than 2,000 in 1972, and further downward to an estimated 1,000 aircraft in 1974.

There were a number of factors responsible for this continuing decline. Principal among them, of course, was reduced purchasing power due to inflation, coupled with the declining DOD budget. These factors plus the greater complexity of certain advanced aircraft brought higher unit costs and limited the numbers procurable within budget allocations. Furthermore, there were reductions in requirements with the end of U.S. participation in the Vietnam War.

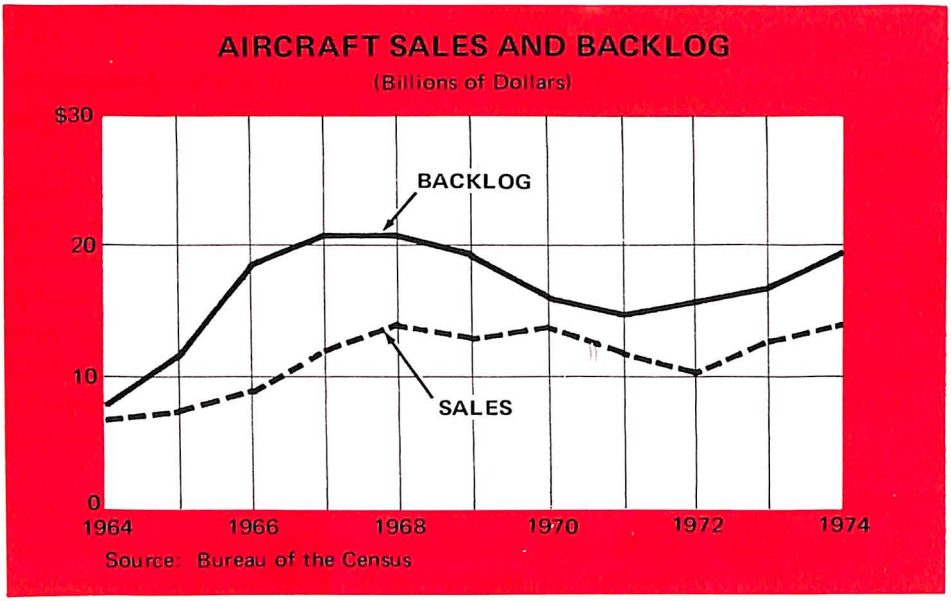
The major military aircraft production programs of 1974, in terms of both units and dollar volume, were the two advanced air superiority fighters, the Navy's F-14 Tomcat and the Air Force's F-15 Eagle.

Other major programs included:

Air Force: the A-10 close air support aircraft, the F-4E Phantom fighter, the A-7D Corsair II attack plane, the F-111F fighter, and the E-3A airborne warning platform.

Navy: The S-3A Viking antisubmarine aircraft, the A-6E Intruder attack aircraft, the EA-6B Prowler electronic countermeasure aircraft, the A-7E Corsair attack aircraft, and the P-3C Orion antisubmarine patrol plane.

Army: The UH-1H Iroquois utility helicopter, the AH-1Q Cobra/TOW missile-launching attack helicopter.



AIRCRAFT SALES AND BACKLOG BY MAJOR MANUFACTURERS OF COMPLETE AIRCRAFT, AIRCRAFT ENGINES AND PARTS

Calendar Years 1960 to Date
(Millions of Dollars)

Year	Aircraft, Aircraft Engines and parts	
	Net Sales	Backlog December 31
1960	$ 6,429	$ 7,736
1961	5,855	7,192
1962	5,900	6,572
1963	5,617	6,811
1964	6,431	7,797
1965	7,057	11,388
1966	8,725	18,479
1967	11,894	20,628
1968	13,850	20,559
1969	12,764	19,188
1970	13,466	15,713
1971	11,392	14,280
1972	10,153	15,632
1973[r]	12,278	16,365
1974	13,504	19,411

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).
NOTE: Based on reports from about 55 aerospace companies.
r Revised.

AIRCRAFT SALES AND BACKLOG BY MAJOR MANUFACTURERS OF COMPLETE AIRCRAFT, AIRCRAFT ENGINES AND PARTS

Calendar Years 1960 to Date
(Millions of Dollars)

Year	TOTAL			Aircraft & Parts[a]		Aircraft Engines & Parts	
	TOTAL	U.S. Gov't	Other	U.S. Gov't	Other	U.S. Gov't	Other
SALES							
1960	$ 6,429	$ 4,246	$ 2,183	$ 3,333	$ 1,766	$ 913	$ 417
1961	5,855	3,967	1,888	2,946	1,455	1,021	433
1962	5,900	4,128	1,772	2,998	1,389	1,130	383
1963	5,617	4,158	1,459	2,986	1,055	1,172	404
1964	6,431	4,568	1,863	3,502	1,409	1,066	454
1965	7,057	4,525	2,532	3,393	1,950	1,132	582
1966	8,725	5,458	3,267	4,086	2,544	1,372	723
1967	11,894	7,141	4,753	5,345	3,737	1,796	1,016
1968	13,850	7,411	6,439	5,697	5,188	1,714	1,251
1969	12,764	7,161	5,603	5,382	4,517	1,779	1,086
1970	13,466	7,586	5,880	5,674	4,683	1,912	1,197
1971	11,392	6,313	5,079	4,953	4,093	1,360	986
1972	10,153	4,954	5,199	3,666	4,085	1,288	1,114
1973[r]	12,278	5,539	6,739	4,231	5,322	1,308	1,417
1974	13,504	6,068	7,436	4,562	5,846	1,506	1,590
BACKLOG - AS OF DECEMBER 31							
1960	$ 7,736	$ 5,357	$ 2,379	$ 4,101	$ 2,031	$ 1,256	$ 348
1961	7,192	5,056	2,136	3,968	1,678	1,088	458
1962	6,572	4,900	1,672	3,736	1,309	1,164	363
1963	6,811	4,924	1,887	3,844	1,457	1,080	430
1964	7,797	5,282	2,515	4,290	1,987	992	528
1965	11,388	6,072	5,316	4,425	4,460	1,647	856
1966	18,479	8,761	9,718	6,515	8,140	2,246	1,578
1967	20,628	20,628[b]		7,071	9,306	4,251[b]	
1968	20,559	8,150	12,409	5,999	10,609	2,151	1,800
1969	19,188	7,089	12,099	5,270	10,340	1,819	1,759
1970	15,713	5,913	9,800	4,663	8,601	1,250	1,199
1971	14,280	6,221	8,059	4,876	7,123	1,345	936
1972	15,632	7,027	8,605	5,705	7,355	1,322	1,250
1973[r]	16,373	7,815	8,550	6,312	7,232	1,503	1,318
1974	19,411	9,805	9,606	7,698	7,791	2,107	1,815

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).
NOTE: Based on reports from about 55 aerospace companies.
a Including Aircraft Propellers and Parts.
b The backlog of "aircraft engines and parts" was not divided by U.S. Government or other customers for 1967 only.
r Revised.

U.S. AIRCRAFT PRODUCTION

Calendar Years 1961 to Date
(Number of Aircraft)

Year	TOTAL[a]	Military	Civil
1961	8,936	1,582	7,354
1962	9,213	1,975	7,238
1963	10,143	1,970	8,173
1964	12,517	2,439	10,078
1965	15,489	2,806	12,683
1966	20,283	3,609	16,674
1967	18,993	4,481	14,512
1968	19,362	4,440	14,922
1969	17,149	3,644	13,505
1970	11,161	3,085	8,076
1971	10,390	2,232	8,158
1972	12,569	1,993	10,576
1973	15,952	1,243	14,709
1974	16,325[E]	1,000[E]	15,325

Source: Aerospace Industries Association, company reports; General Aviation Manufacturers' Association, company reports; Department of Defense.
NOTE: For aircraft production data prior to 1961, see earlier editions of "Aerospace Facts and Figures."
a Excludes aircraft produced for the Military Assistance Program.
E Estimate.

CIVIL AIRCRAFT ENGINE PRODUCTION

Fiscal Years 1970 to Date
(Number of Engines)

Type of Engine	1970	1971	1972	1973	1974	1975[E]
TOTAL	14,512	11,687	13,344	18,159	23,888	24,291
Turbojet	1,576	1,134	641	688	1,410	1,400
Turboprop	657	625	811	1,220	1,590	1,619
Piston	12,279	9,928	11,892	16,251	20,888	21,272

Source: Federal Aviation Administration, Office of Aviation Economics, "Aviation Forecasts."
NOTE: Civil aircraft engines for export are included. Excludes all aircraft engines produced for military use whether for the United States or for a foreign government.
E Estimate.

CIVIL AIRCRAFT ENGINE PRODUCTION

By Selected Manufacturers
Calendar Years 1970 to Date
(Number of Engines)

Manufacturer and Engine Model	1970	1971	1972	1973	1974
TOTAL	6,467	7,309	8,902	12,147	13,178
General Electric—TOTAL	148	235	261	393	447
CT-58	21	2	13	12	31
CF-6	—	119	122	162	210
CJ-610	93	87	100	101	105
CF-700	34	27	26	118	101
Pratt & Whitney—TOTAL	1,120	594	443	759	1,246
JT-3D	127	49	13	74	120
JT-8D	448	176	282	469	600
JT-9D	466	369	148	164	106
JT-12	79	—	—	52	48
JT-15	—	—	—	—	191
PT-6	—	—	—	—	181
Avco-Lycoming—TOTAL	5,199	6,480	8,198	10,995	11,485
IO-720	36	10	49	74	90
TIO-541/TIGO-541	160	113	157	294	232
O-540/IO-541/TIO-540/LTIO-540/ IGSO-540/VO-540	1,355	1,876	1,824	2,814	3,048
GO-480/IGSO-480/GSO-480	100	79	101	134	138
VO-435/TVO-435	114	133	76	99	59
O-360/IO-360/TIO-360/LIO-360/ HIO-360/AIO-360/VO-360/ AEIO-360	1,442	1,828	2,840	3,233	3,067
O-320/IO-320/LIO-320	1,684	2,007	2,731	3,859	4,489
O-235	302	430	420	488	362
Other	6	4	—	—	—

Source: Aerospace Industries Association, company reports.

TRANSPORT AIRCRAFT PRODUCTION

(Fixed Wing, Multiple Engine)
Calendar Years 1970 to Date

Company and Aircraft	1970	1971	1972	1973	1974
TRANSPORTS					
Number of Aircraft Shipped – TOTAL[a]	311	223	227	294	332
Value–Millions of Dollars– TOTAL	$3,158	$2,594	$2,660	$3,718	$3,993
Company and Model					
Boeing–TOTAL	202	141	96	148	174
B-707	19	10	3	11	21
B-727	54	33	41	92	91
B-737	37	29	22	17	41
B-747	92	69	30	28	21
Lockheed–TOTAL	25	13	51	68	64
Hercules	25	13	34	29	23
L-1011	–	–	17	39	41
McDonnell Douglas–TOTAL	84	69	80	78	94
DC-8	33	13	4	–	–
DC-9	51	43	24	21	48
DC-10	–	13	52	57	46

Source: Aerospace Industries Association, company reports.
[a] Commercial transport totals differ from FAA totals for "Transports" because the FAA totals include some executive aircraft and transports for other than commercial use.

JET TRANSPORT ORDERS

Domestic and Foreign
As of December 31, 1974

	TOTAL Aircraft for Delivery in 1975 or Later	Domestic Orders	Foreign Orders
TRANSPORTS			
Number of Aircraft on Order . .	564	208	356
Value—Millions of Dollars[a]	$ 7,587	$ 2,294	$ 5,293
Company and Model			
Boeing—TOTAL	210	98	112
B-707	14	—	14
B-727	121	80	41
B-737	46	14	32
B-747	29	4	25
Lockheed—TOTAL	178	61	117
L-1011[b]	112	57	55
L-100-30/C-130 (Hercules) . .	66	4	62
McDonnell Douglas[b]—TOTAL . .	176	49	127
DC-9	91	33	58
DC-10	85	16	69

Source: Aerospace Industries Association, company reports.
a Dollar value excludes the cost of spare parts.
b Includes options.

HELICOPTER
COMMERCIAL PRODUCTION
Calendar Years 1970 to Date

	1970	1971	1972	1973	1974
Number of Helicopters Shipped	482	469	575	770	828
Value — Millions of Dollars	$ 49	$ 69	$ 90	$ 121	$ 189
Company and Model					
Bell — TOTAL	288	274	329	477	467
47 Series	124	110	97	92	3
204 Series	—	1	—	4	—
205 Series	23	13	17	29	26
206 Series	138	129	193	304	368
212 Series	3	21	22	48	70
Boeing-Vertol — TOTAL	—	5	6	2	11
CH-47C	—	5	6	2	11
Enstrom — TOTAL	—	17	38	64	87
F-28A	—	17	38	64	86
280	—	—	—	—	1
Fairchild — TOTAL	37	21	28	10	—
FH-1100	37	21	28	10	—
Hiller — TOTAL	—	—	—	—	3
12-E	—	—	—	—	3
Hughes — TOTAL	149	137	155	211	248
300's	74	54	71	96	105
500's	75	83	84	115	143
Sikorsky (UAC) — TOTAL	8	15	19	6	12
S-61	6	9	13	6	12
S-65	2	6	6	—	—

Source: Aerospace Industries Association, company reports.
NOTE: All figures exclude foreign licensees.

GENERAL AVIATION AIRCRAFT SHIPMENTS

By Selected Manufacturers
Calendar Years 1960 to Date

Year	TOTAL	Beech	Cessna	Gates Learjet	Grumman American	Piper	Rockwell Intl.	Other
Number of Aircraft Shipped								
1960	7,588	962	3,720	—	—	2,313	155	438
1961	6,778	818	2,746	—	—	2,646	139	429
1962	6,697	830	3,124	—	—	2,139	121	483
1963	7,569	1,061	3,456	—	—	2,321	114	617
1964	9,336	1,103	4,188	3	—	3,196	109	737
1965	11,852	1,192	5,629	80	—	3,776	110	1,065
1966	15,747	1,535	7,888	51	70	4,437	265	1,501
1967	13,577	1,260	6,233	34	52	4,490	386	1,122
1968	13,698	1,347	6,578	41	N.A.	4,228	471	1,033
1969	12,457	1,061	5,887	61	306	3,951	344	847
1970	7,283	793	3,730	35	217	1,675	211	622
1971	7,466	519	3,859	23	435	2,055	202	373
1972	9,774	802	4,964	39	620	2,461	242	646
1973	13,645	1,110	7,262	66	663	3,233	418	893
1974	14,165	1,303	7,187	66	628	3,415	545	1,021
Value[a] of Shipments of Aircraft (Millions of Dollars)								
1960	$151.2	$ 43.1	$ 56.7	$ —	$ —	$ 35.1	$ 11.9	$ 4.4
1961	124.3	37.1	42.3	—	—	28.9	11.0	5.0
1962	136.8	37.4	50.2	—	—	32.1	10.8	6.3
1963	153.4	38.6	55.7	—	—	38.5	11.8	8.8
1964	198.9	54.9	66.8	N.A..	—	54.5	12.0	10.7
1965	318.3	72.2	97.2	45.1	—	61.7	27.7	14.4
1966	444.2	97.3	128.2	28.6	N.A.	80.1	51.5	58.5
1967	359.6	92.0	116.6	20.2	N.A.	79.4	31.8	19.6
1968	421.5	115.7	138.8	28.7	N.A.	85.5	22.3	30.5
1969	584.5	113.1	145.6	46.5	129.0	98.2	25.4	26.7
1970	339.4	80.7	97.2	26.9	42.2	48.5	20.1	23.8
1971	321.5	52.1	102.4	18.1	45.6	56.7	24.7	21.9
1972	557.6	113.3	183.2	35.1	58.4	72.3	60.9	34.4
1973	826.4	140.4	298.0	61.5	75.0	126.8	80.4	44.3
1974	907.7	170.2	313.9	66.0	67.6	131.7	125.2	33.1

Source: 1960-1969: Aerospace Industries Association, company reports.
1970-1974: General Aviation Manufacturers' Association.
NOTE: "Other" includes Bellanca, Lake, Lockheed Jetstar, Maule, Mooney and Swearingen.
N.A. Not Available.
a Manufacturers' Net Billing Price.

CIVIL AIRCRAFT SHIPMENTS

Number and Value
Calendar Years 1961 to Date

Year	TOTAL	Transport Aircraft	Helicopters	General Aviation
NUMBER OF AIRCRAFT SHIPPED				
1961	7,354	198	378	6,778
1962	7,238	134	407	6,697
1963	8,173	100	504	7,569
1964	10,078	163	579	9,336
1965	12,683	233	598	11,852
1966	16,674	344	583	15,747
1967	14,512	480	455	13,577
1968	14,922	702	522	13,698
1969	13,505	514	534	12,457
1970	8,076	311	482	7,283
1971	8,158	223	469	7,466
1972	10,576	227	575	9,774
1973	14,709	294	770	13,645
1974	15,325	332	828	14,165
VALUE–MILLIONS OF DOLLARS				
1961	$ 849	$ 725	$ N.A.	$ 124
1962	742	605	N.A.	137
1963	559	406	N.A.	153
1964	986	787	N.A.	199
1965	1,554	1,197	39	318
1966	2,183	1,699	40	444
1967	2,861	2,458	43	360
1968	4,267	3,789	57	421
1969	3,598	2,939	75	584
1970	3,546	3,158	49	339
1971	2,984	2,594	69	321
1972	3,308	2,660	90	558
1973	4,665	3,718	121	826
1974	5,090	3,993	189	908

Source: Transport aircraft and helicopters: Aerospace Industries Association.
General Aviation: General Aviation Manufacturers' Association.

DEPARTMENT OF DEFENSE
OUTLAYS FOR AIRCRAFT PROCUREMENT

By Agency
Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	TOTAL DOD	Air Force	Navy	Army
1960	$ 6,272	$ 4,414	$ 1,765	$ 93
1961	5,898	3,926	1,832	140
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

Source: Department of Defense, OASD (Comptroller), FAD 748/74, June 30, 1974, and earlier reports.
a Fiscal Years ending June 30.

MILITARY AIRCRAFT PRODUCED
NUMBER AND FLYAWAY VALUE
Calendar Years 1961 to 1973

Year	Type of Aircraft						
	TOTAL	Bomber	Fighter/ Attack	Trans- port	Trainer	Heli- copter	Other
NUMBER							
1961	1,582	397	376	148	203	366	92
1962	1,975	398	437	256	211	554	119
1963	1,970	310	423	282	204	672	79
1964	2,439	362	586	254	191	1,007	39
1965	2,806	283	496	136	396	1,470	25
1966	3,609	214	627	142	442	2,164	20
1967	4,481	404	811	135	331	2,448	352
1968[a]	4,440	34	1,007	18	292	2,800	289
1969[a]	3,644	31	792	44	295	2,165	317
1970[a]	3,085	66	734	37	173	1,944	131
1971[a]	2,232	48	386	42	135	1,587	34
1972[a]	1,993	13	491	28	97	1,312	52
1973[a]	1,243	30	309	22	74	808	–
FLYAWAY VALUE—Millions of Dollars							
1961	$ 4,497	$ 2,575	$ 1,054	$ 385	$ 200	$ 228	$ 55
1962	3,816	1,629	1,005	674	194	250	64
1963	2,876	798	931	587	182	337	41
1964	3,080	802	1,155	624	122	356	21
1965	2,875	639	960	655	108	490	23
1966	3,554	612	1,289	701	190	749	13
1967	4,476	822	1,721	759	144	962	68
1968[a]	3,871	117	2,451	81	167	905	150
1969[a]	3,693	248	2,204	101	164	845	131
1970[a]	3,920	545	1,940	555	111	694	75
1971[a]	2,996	397	1,322	688	112	469	8
1972[a]	3,247	129	2,068	536	100	396	18
1973[a]	2,571	325	1,490	348	140	268	–

Source: Department of Defense, OASD (Comptroller).
NOTE: Data exclude gliders and targets and include spares, spare parts, and support equipment that are procured with the basic aircraft.
a 1961–1967, Navy attack planes included with Bombers; 1968–1973, Navy attack planes included under Fighter/Attack.

FLYAWAY COST OF MILITARY AIRCRAFT

Army Acceptances by Type and Model
Calendar Years 1972 and 1973
(Millions of Dollars)

Type and Model	Number		Flyaway Cost[a]	
	1972	1973	1972	1973
ARMY, TOTAL	1,122	616	$ 337	$ 143
Helicopters, Total	1,106	616	320	143
AH-1G	178	28	91	14
UH-1H	340	189	117	65
OH-58A	578	399	92	64
CH-47C	10	–	20	–
Observation, Total	16	–	17	–
RU-21E	16	–	17	–

Source: Department of the Army.
a Flyaway cost includes airframe, engines, electronics, communications, armament and other installed equipment.

FLYAWAY COST OF MILITARY AIRCRAFT

Navy Acceptances by Type and Model
Calendar Years 1972 and 1973
(Millions of Dollars)

Type and Model	Number		Flyaway Cost[a]		Weapon System Cost[b]	
	1972	1973	1972	1973	1972	1973
NAVY, TOTAL	252	248	$ 812	$ 1,234	$ 1,063	$ 1,523
Patrol, Total	13	30	129	325	166	383
P-3C	13	24	129	205	166	225
S-3A	—	6	—	120	—	158
Attack, Total	107	75	412	339	560	407
A-4M	34	—	50	—	63	—
A-6E	14	12	81	67	126	93
EA-6B	10	12	142	131	181	153
A-7E	30	24	74	62	111	75
AV-8A	19	27	65	79	79	86
Fighters, Total	9	32	139	414	191	558
F-14A	9	32	139	414	191	558
Trainers, Total	94	69	100	72	110	83
T-2C	38	34	29	28	29	32
TA-4J	56	35	71	44	81	51
Helicopters, Total	29	42	32	84	36	92
UH-1N	23	18	14	12	17	16
RH-53D	6	24	18	72	19	76

Source: Department of the Navy.
a Flyaway Cost includes airframe, engines, electronics, communications, armament and other installed equipment.
b Weapon System Cost includes flyaway items, initial spares, ground equipment and training equipment.

FLYAWAY COST OF MILITARY AIRCRAFT

Air Force Acceptances by Type and Model
Calendar Years 1972 and 1973
(Millions of Dollars)

Type and Model	Number		Flyaway Cost[a]		Weapon System Cost[b]	
	1972	1973	1972	1973	1972	1973
AIR FORCE, TOTAL.	619	379	$ 2,098	$ 1,194	$ 2,249	$ 1,271
Fighters/Attack, Total.	375	202	1,517	737	1,646	791
A-7	108	97	249	228	277	229
A-37	79	—	32	—	33	—
F-4, RF-4	35	48	108	163	123	185
F-5, RF-5	8	29	8	74	9	86
F-111	115	28	1,107	272	1,190	291
AU-23, AU-24	30	—	13	—	14	—
Transports, Total	28	22	536	348	557	363
C-5	18	9	491	248	511	257
C-9	9	—	37	—	37	—
VC-137	1	—	8	—	9	—
C-130	—	11	—	37	—	37
E-4	—	2	—	63	—	69
Trainers, Total	3	5	(c)	68	(c)	75
T-41D	3	—	(c)	—	(c)	—
T-43	—	5	—	68	—	75
Helicopters, Total	177	150	44	41	44	42
UH-1	175	122	43	30	43	30
HH-1	2	28	1	11	1	12
Utility, Total	36	—	1	—	2	—
U-17	36	—	1	—	2	—

Source: Department of the Air Force.
a Flyaway Cost includes airframe, engines, electronics, communications, armament and other installed equipment.
b Weapon System Cost includes flyaway items, initial spares, ground equipment and training equipment.
c Less than $500,000.

MILITARY AIRCRAFT PROGRAM ACQUISITION COSTS[a]
PROCUREMENT, INCLUDING INITIAL SPARES

By Agency, Type and Model
Fiscal Years[b] 1975, 1976 and the Transition Quarter
(Millions of Dollars)

Agency, Type and Model	1975[E]		1976[E]		Transition Quarter[E]	
	No.	Cost	No.	Cost	No.	Cost
AIR FORCE						
A-7D Corsair II	24	$100.1	—	$ —	—	$ —
A-10 Close Air Support	22	179.8	61	408.1	33	106.2
A-37B Attack Aircraft	60	32.2	—	—	29	15.7
B-1 Bomber	—	—	—	77.0	—	31.0
C-130H Hercules	20	90.0	42	216.2	4	37.0
C-12A	—	—	16	11.8	—	—
E-3A AWACS	6	407.5	6	490.5	—	30.0
E-4A AABNCP	—	—	—	—	3	185.8
F-4E Phantom	48	170.1	24	99.6	—	15.6
F-5E Fighter Aircraft	71	77.4	—	—	—	—
F-5F Fighter Aircraft	—	—	—	—	28	91.1
F/TF-15A Eagle	72	913.4	108	1,643.5	27	355.9
F-111F Fighter Aircraft	12	207.6	—	—	—	—
NAVY						
A-4M Skyhawk	—	2.6	24	70.0	—	—
A-6E Intruder	12	131.4	12	156.2	—	—
EA-6B Prowler	6	128.7	6	120.4	1	13.8
A-7E Corsair II	30	124.6	30	167.6	6	39.6
F-14A Tomcat	50	720.7	36	619.7	9	138.4
UH-1N Iroquois	15	15.5	24	30.3	6	6.6
AH-1J Sea Cobra	—	—	16	42.2	6	12.7
P-3C Orion	12	151.1	12	175.7	3	62.1
S-3A Viking	45	557.7	41	516.0	—	0.8
E-2C Hawkeye	6	124.6	6	161.4	1	23.3
C-9B Skytrain II	6	44.4	—	—	—	—
CT-39 Sabre Liner	6	10.9	—	—	—	—
KC-130R Hercules	—	44.1	—	—	4	40.6
VTAMX Adv. Trainer	—	—	15	9.2	3	4.8
T-34C Mentor	18	7.0	115	29.5	36	9.7
EC-130Q TACAMO IV	—	—	1	21.1	—	—
CH-53E Sea Stallion	—	—	—	20.0	—	—
ARMY						
AH-1Q Cobra/TOW	6	15.3	38	50.3	22	29.6
CH-47C Chinook	—	—	12	36.4	—	—
UH-1H Iroquois	48	18.5	48	24.8	—	—
U-X Utility Airplane	—	—	20	14.0	—	—
STOL	—	—	2	2.0	—	—

Source: "Program Acquisition Costs by Weapon System," Department of Defense Budget for Fiscal Year 1976.

NOTE: For an explanation of the Transition Quarter, see page 25.

a Total Obligational Authority.
b Fiscal Years ending June 30.
E Estimate.

Missile Programs

Missile systems in 1974 accounted for nearly $3.5 billion of the industry's total sales, a slight increase over the levels of the preceding two years, but adjusted for inflation, it represented a substantial decline in missile acquisitions.

The U.S. kept its strategic missile strength in 1974 at the standard levels maintained since 1967: 1,054 land-based intercontinental ballistic missile (ICBM) launchers and 656 sea-launched ballistic missile (SLBM) tubes. The Air Force's silo-based ICBM force included 1,000 Minuteman missiles and 54 Titan IIs. The Navy's SLBM complement consisted of a mix of Polaris and Poseidon missiles aboard 41 nuclear submarines, each carrying 16 missile tubes.

Of the four strategic missiles in service, only Minuteman and Poseidon were in production during 1974. The land-based ICBM force is continually being updated by gradual replacement of earlier models of the Minuteman with

advanced versions incorporating the latest in missile technology. Minuteman production is to continue at least through 1977.

In similar fashion, Poseidon is gradually replacing Polaris. A number of Poseidon subs were outfitted during 1974 and it is expected that 350 of the total 656 SLBM tubes would be Poseidon-equipped by June 1975. The Poseidon production goal is 496 deployed weapons, or 31 of the 41 ballistic missile submarines.

Among other missiles being produced in 1974 were several of the joint-use type, those used by more than one of the military services. These include the Sparrow, an air-to-air weapon that has been in production since 1958; Sidewinder, also an air-to-air missile; Shrike, an air-to-ground countermeasure weapon; Standard ARM, an air-launched anti-radar system; Hawk, an anti-aircraft missile; Dragon, an anti-tank weapon; and TOW, a wire-guided anti-tank missile.

Being produced for the Air Force are two air-to-surface missiles, the Maverick, a TV-guided air-to-surface missile and SRAM (Short Range Attack Missile). Navy production missiles include the Phoenix, an air-to-air missile; Harpoon, an air-to-surface weapon; Standard, a ship-based air defense missile which is built in medium and extended range versions; and Condor, a TV-guided air-to-surface weapon. Army missiles in production include the Pershing battlefield missile and the Lance surface-to-surface artillery missile. In limited production is the new Safeguard anti-ballistic missile defense system.

In addition to producing operational missiles, the industry is heavily engaged in R&D for new systems designed to increase missile force capability. In dollars, this volume amounted to $2.2 billion in 1974, a level approximately the same as the previous four years but, when adjusted for inflation, reflects a reduced effort by DOD.

The largest developmental program in 1974 was the Trident SLBM system which includes a new submarine and an advanced missile as eventual replacements for the Polaris/Poseidon. The Trident, which will have a 4,000-mile range to Poseidon's 2,500, is in advanced development.

In study status and planned for full development later is a similar upgrading of land-based ICBM capability. Known as MX, the advanced ICBM is designed for operational readiness in the eighties. DOD is also developing long-range cruise-type missiles, the ALCM (Air-Launched Cruise Missile) and the SLCM (Sea-Launched Cruise Missile). Other development programs currently include the SAM-D air defense system; the Hellfire helicopter-launched antitank weapon; Stinger, a surface-to-air missile; and the Brazo air-to-air missile.

SALES AND BACKLOG OF MAJOR MANUFACTURERS OF MISSILE SYSTEMS AND PARTS

Calendar Years 1961 to Date
(Millions of Dollars)

Year	Missile Systems and Parts	
	Net Sales	Backlog December 31
1961	$ 3,628	$ 2,873
1962	3,699	2,143
1963	3,318	2,146
1964	2,580	1,921
1965	2,082	2,394
1966	2,260	2,157
1967	2,877	3,121
1968	2,812	3,218
1969	2,676	2,511
1970	2,826	2,721
1971	2,641	3,344
1972	3,335	3,642
1973[r]	3,391	3,877
1974	3,452	4,700

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).
NOTE: Based on data from about 55 companies engaged in the manufacture of aerospace products. Data exclude sales of military engines and propulsion units. See page 50.
r Revised.

SALES AND BACKLOG OF MAJOR MANUFACTURERS OF ENGINES AND PROPULSION UNITS FOR MISSILES AND SPACE VEHICLES

Calendar Years 1961 to Date
(Millions of Dollars)

Year	Net Sales			Backlog as of Dec. 31		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1961	$ N.A.	$ 784	$ (a)	$ N.A.	$ 367	$ (a)
1962	N.A.	1,060	(a)	N.A.	498	(a)
1963	1,675	1,153	522	888	699	189
1964	1,579	851	728	1,024	557	467
1965	1,288	560	728	883	513	370
1966	1,211	511	700	859	534	325
1967	978	441	537	609	405	204
1968	907	676	231	535	406	129
1969	702	667	35	497	485	12
1970	640	618	222	617	610	7
1971	605	596	9	520	513	7
1972	607	596	11	671	659	12
1973[r]	627	607	20	615	615	10
1974	651	635	16	685	669	16

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).
NOTE: Based on data from about 55 companies engaged in the manufacture of aerospace products. The figures are inflated by the inclusion of subcontracts.
N.A.: Not Available.
a Data included in totals for space vehicle systems. See page 62.
r Revised.

DEPARTMENT OF DEFENSE
OUTLAYS FOR GUIDED MISSILES

Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	TOTAL DOD	Procurement	Research, Development, Test and Evaluation
1960	$ 5,086	$ 3,027	$ 2,059
1961	5,997	2,972	3,025
1962	6,219	3,442	2,777
1963	6,058	3,817	2,241
1964	5,929	3,577	2,352
1965	3,997	2,096	1,901
1966	3,870	2,069	1,801
1967	4,432	1,930	2,502
1968	4,741	2,219	2,522
1969	4,919	2,509	2,410
1970	5,108	2,912	2,196
1971	5,148	3,140	2,008
1972	5,166	3,009	2,157
1973	5,061	3,023	2,038
1974	5,141	2,981	2,160

Source: Department of Defense, OASD (Comptroller), FAD 748/74, June 30, 1974, and earlier reports.
NOTE: Does not include Military Assistance.
a Fiscal Years ending June 30.

DEPARTMENT OF DEFENSE
OUTLAYS FOR GUIDED MISSILES PROCUREMENT

By Agency
Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	TOTAL DOD	Air Force	Navy	Army
1960	$ 3,027	$ 2,021	$ 423	$ 583
1961	2,972	1,922	493	557
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

Source: Department of Defense, OASD (Comptroller), FAD 748/74, June 30, 1974, and earlier reports.

NOTE: For data on research and development expenditures for missiles see page 97.

a Fiscal Years ending June 30.

MISSILE PROGRAM ACQUISITION COSTS[a]
PROCUREMENT, INCLUDING INITIAL SPARES

By Agency, Type and Model
Fiscal Years[b] 1975, 1976 and Transition Quarter
(Millions of Dollars)

Agency, Type and Model	1975[E]		1976[E]		Transition Quarter[E]	
	Units	Cost	Units	Cost	Units	Cost
AIR FORCE						
Minuteman II & III	61	$ 601.8	50	$ 657.2	–	$ 70.5
SRAM	–	1.5	–	–	–	–
Maverick	5,600	73.1	6,000	144.8	1,200	25.2
NAVY						
Poseidon	–	39.4	–	33.1	–	6.6
Trident I	–	11.3	–	235.7	–	181.2
Sparrow[c]	600	97.3	980	143.0	–	1.7
Sidewinder[c]	800	19.7	2,310	109.4	–	0.9
Phoenix	340	98.0	340	101.2	–	27.0
Shrike[c]	1,170	36.7	1,318	47.0	300	9.7
Condor	–	–	205	91.0	38	10.4
Standard-ARM	–	0.7	–	1.1	–	0.1
Harpoon	150	83.7	270	150.0	95	44.9
Standard-MR	200	29.7	285	39.1	54	7.6
Standard-ER	–	3.8	22	52.8	–	–
Standard-SSM (ARM)	62	8.3	–	1.1	–	–
ARMY						
Chaparral	–	–	–	37.5	–	1.0
Hawk[d]	750	103.4	660	94.0	–	–
Dragon[d]	15,154	98.3	26,315	140.7	8,128	32.7
TOW[d]	30,179	133.2	24,311	143.5	6,693	23.3
Lance	194	65.8	–	1.0	–	–
Pershing	–	8.5	–	17.7	–	–
AN/TSQ-73	–	5.7	–	6.9	–	1.2

Source: "Program Acquisition Costs by Weapon System," Department of Defense Budget for Fiscal Year 1976.
NOTE: For an explanation of the Transition Quarter, see page 25.
a Total Obligational Authority.
b Fiscal Years ending June 30.
c Includes Air Force procurement.
d Includes Marine Corps procurement.
E Estimate.

MAJOR MISSILES
DEVELOPMENT, PRODUCTION AND OPERATION

Project	Agency	Systems Contractor	Propulsion		Guidance Manufacturer	Status
			Manufacturer	Type		
AIR-TO-AIR						
BDM	USAF	Raytheon	—	—	—	Research
Brazo	USAF, USN	Hughes	—	—	Navy Elect. Center	Development
Falcon	USAF	Hughes	Thiokol	Solid	Hughes	Operational
Nuclear Falcon	USAF	Hughes	Thiokol	Solid	Hughes	Operational
Genie	USAF	McDonnell Douglas	Thiokol	Solid	—	Operational
Phoenix	USN	Hughes	Aerojet	Solid	Hughes	Development
Sidewinder-9D	USN	Raytheon/ GE	RI/Rocket-dyne	Solid	Raytheon/ GE	Operational
Sidewinder-9J	USAF	Philco-Ford	—	Solid	Philco-Ford	Production
Sidewinder-9H, 9L	USN	NWC/ Raytheon	—	—	—	Operational
Sparrow	USN	Raytheon	Aerojet/ Hercules	Solid	Raytheon	Operational
AIR-TO-SURFACE						
ALCM	USAF	Boeing	Williams	Turbojet	—	Development
Bullpup (12B)	USN	Numax	Thiokol	Liquid	Numax	Operational
Bullpup (12C)	USN	Numax	Thiokol	Liquid	Numax	Operational
Condor	USN	NASC/RI	RI/Rocket-dyne	Solid	RI/MSD	Production
Harpoon	USN	McDonnell Douglas	Teledyne CAE/ Aerojet	Solid	Texas Instruments	Development
Hornet	USAF	RI/MSD	Thiokol	Solid	RI/Autonetics	Development
Hound Dog	USAF	RI	P & W	Turbojet	RI/Autonetics	Operational
Maverick	USAF	Hughes	Thiokol	Solid	Hughes	Production
Quail	USAF	McDonnell Douglas	General Electric	Turbojet	McDonnell Douglas	Operational
Shrike	USN, USAF	NASC/ NWC	Aerojet	Solid	TI/SR/ Univac	Operational
SRAM	USAF	Boeing	Lockheed Propulsion	Solid	Singer	Operational

(Continued on next page)

MAJOR MISSILES
DEVELOPMENT, PRODUCTION AND OPERATION (Continued)

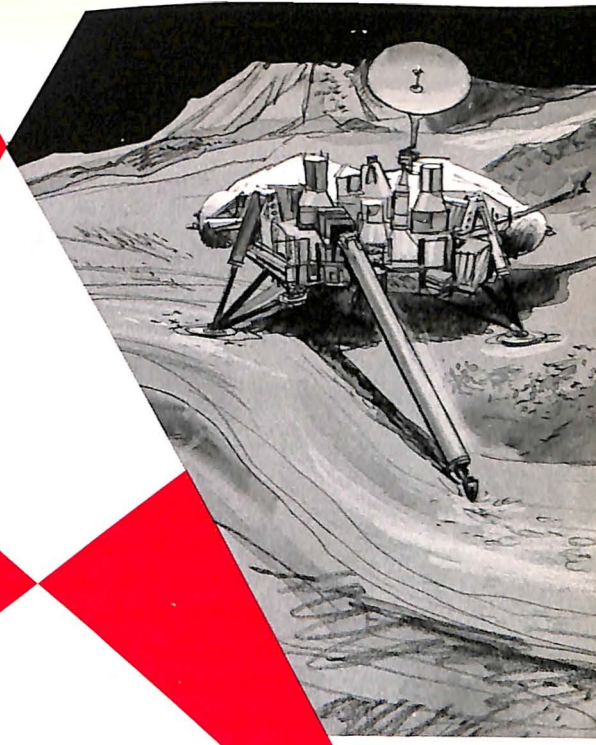
Project	Agency	Systems Contractor	Propulsion		Guidance Manufacturer	Status
			Manufacturer	Type		
AIR-TO-SURFACE (Cont.)						
Standard ARM	USN, USAF	General Dynamics	Aerojet	Solid	Numax	Operational
Walleye	USN	Martin Marietta/ Hughes	—	Glide Bomb	Martin Marietta/ Hughes	Operational
ANTI-SUBMARINE						
Asroc	USN	Honeywell	Navy	Solid	—	Operational
Subroc	USN	Goodyear Aerospace	Thiokol	Solid	Singer	Operational
SURFACE-TO-AIR						
Chaparral	Army	Philco-Ford	RI/Rocketdyne	Solid	GE/ Raytheon	Operational
Hawk	Army	Raytheon	Aerojet	Solid	Raytheon	Operational
Nike-Hercules	Army	Western Electric	Thiokol/ Hercules	Solid	BTL/ Western Electric	Operational
Redeye	Army	General Dynamics	Atlantic Research	Solid	Norden	Operational
Roland	Army	Hughes/ Boeing	—	Solid	Hughes/ Boeing	Development
SAM-D	Army	Raytheon	Thiokol	Solid	Raytheon	Development
Sea Sparrow	USN	Raytheon	Aerojet	Solid	Raytheon	Operational
Safeguard	Army	BTL/ Western Electric	Thiokol	Solid	BTL/ Western Electric	Production
Standard (MR)	USN	General Dynamics	Aerojet/ Hercules	Solid	General Dynamics	Operational
Standard (ER)	USN	General Dynamics	Atlantic Research	Solid	General Dynamics	Operational
Stinger	Army, USMC	General Dynamics	Atlantic Research	—	General Dynamics	Development
Talos	USN	Bendix	Bendix	Ramjet	Bendix	Operational
Tartar	USN	General Dynamics	Aerojet	Solid	General Dynamics	Operational
Terrier	USN	General Dynamics	Atlantic Research	Solid	General Dynamics	Operational

(Continued on next page)

MAJOR MISSILES
DEVELOPMENT, PRODUCTION AND OPERATION (Continued)

Project	Agency	Systems Contractor	Propulsion		Guidance Manufacturer	Status
			Manufacturer	Type		
SURFACE-TO-SURFACE						
Minuteman 2	USAF	Boeing	Thiokol/ Aerojet/ Hercules	Solid	RI/Autonetics	Operational
Minuteman 3	USAF	Boeing	Thiokol/ Aerojet	Solid	RI/Autonetics	Operational
Polaris A2	USN	Lockheed MSC	Aerojet/ Hercules	Solid	GE/MIT/ Hughes	Operational
Polaris A3	USN	Lockheed MSC	Aerojet/ Hercules	Solid	GE/MIT/ Hughes	Operational
Poseidon	USN	Lockheed MSC	Thiokol/ Hercules	Solid	GE/MIT/ Hughes/ Raytheon	Operational
SLCM	USN	General Dynamics	Williams	Turbofan	—	Development
Titan II	USAF	AFSC/ SAMSO/ TRW	Aerojet	Liquid	GM/Delco Electronics	Operational
Trident I	USN	Lockheed MSC	Hercules/ Thiokol	Solid	GM/Delco Electronics	Production
BATTLEFIELD SUPPORT GUIDED MISSILES						
Dragon	Army	McDonnell Douglas	McDonnell Douglas	Solid	McDonnell Douglas	Production
Hellfire	Army	Hughes/RI	—	Solid	—	Development
Lance	Army	LTV Aerospace	RI/Rocketdyne	Liquid	Arma/ E-Systems	Operational
Pershing 1-A	Army	Martin Marietta	Thiokol	Solid	Bendix	Operational
Sergeant	Army	SR/Univac	Thiokol	Solid	SR/Univac	Operational
Shillelagh	Army	Philco-Ford	Amoco Chem.	Solid	Philco-Ford	Operational
TOW	Army	Hughes	Hercules	Solid	—	Operational

Source: Aerospace Industries Association, based on latest available information.



Space Programs

The U.S. national space program continued in 1974 at an activity level roughly equivalent to the previous year as an increase in military space work offset a further slight decline in civil space effort.

In terms of funding for space activities, NASA outlays for FY 1974 dropped to $2.9 billion, a decrease of $109 million from 1973. This marked the eighth consecutive year of decline in outlays and the first time since 1962 that outlays dropped below the $3 billion level. DOD outlays for space activities increased $220 million to a total of $1.8 billion.

In the area of manned space flight, NASA brought to a successful conclusion the Skylab program after nine months of orbital operation. The first U.S. space station, Skylab, was an orbital research laboratory intermittently manned by teams of astronauts ferried to the station by Apollo spacecraft. The third period of occupancy, initiated late in 1973, carried over into 1974. This mission set an

all-time record for duration in space with an 84-day research period during which 34.5 million miles in orbit were achieved.

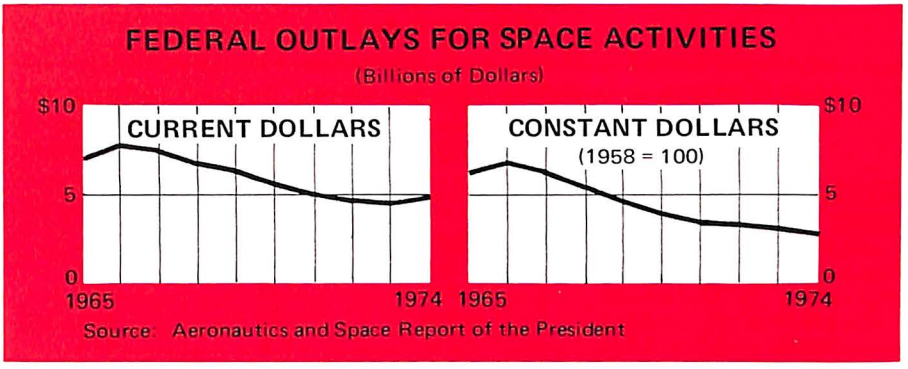
NASA's principal 1974 effort was devoted to the Apollo-Soyuz Test Project, a joint mission with the Soviet Union for development of hardware and techniques for a universal docking system that will make possible further international cooperation in manned space flight. The mission, involving a rendezvous and docking of an American Apollo and a Soviet Soyuz spacecraft, is scheduled for the summer of 1975.

NASA in 1974 was also working on hardware development and operations planning for the Space Shuttle, the transportation system designed for high-frequency earth-orbital flights involving a wide variety of earth-benefit applications and scientific projects. The reusable space vehicle is scheduled for atmospheric flight testing in 1977 and first orbital operations in 1979.

Among the major launches of the year were WESTAR-A, a synchronous (stationary) communications satellite positioned by NASA for Western Union on a reimbursable basis; SMS-1, a Synchronous Meteorological Satellite which can provide both night and day weather information where earlier metsats report only daytime data; the ATS-6 advanced applications satellite designed to send a high quality signal to inexpensive earth receivers, a major benefit for developing nations; and the Helios-A solar probe, a spacecraft developed jointly with West Germany to investigate the space environment near the sun. NASA also launched one each ITOS meteorological satellite and INTELSAT IV communications satellite for the operational networks of the National Oceanic and Atmospheric Administration and Comsat Corporation, respectively.

DOD continued to develop new systems and advanced technology for several programs involving application of unmanned satellites to defense needs. In this area is the Defense Meteorological Satellite Program, the Satellite Early Warning System and a variety of communications satellites. The latter included the global Defense Communications Satellite System and certain specialized Comsat systems such as AFSATCOM, an Air Force network, the Navy's FLTSATCOM, and INTSAT which is designed for communications with NATO forces.

Also in development was the NavStar Global Positioning System. To be used by all of the military services, NavStar is designed to provide positioning data of unprecedented precision. It is described by DOD as a system which "could revolutionize world navigation and weapon delivery."



OUTLAYS FOR SPACE ACTIVITIES

Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	TOTAL	National Aeronautics and Space Administration[b]	Department of Defense[c]	Atomic Energy Commission	Other
1960	$ 960	$ 401	$ 518	$ —	$ 41
1961	1,518	744	710	—	64
1962	2,418	1,257	1,029	130	2
1963	4,114	2,552	1,368	181	13
1964	5,970	4,171	1,564	220	15
1965	6,886	5,035	1,592	232	27
1966	7,719	5,858	1,638	188	35
1967	7,237	5,337	1,673	184	43
1968	6,667	4,595	1,890	146	36
1969	6,330	4,083	2,095	116	36
1970	5,453	3,565	1,756	103	29
1971	4,999	3,171	1,693	97	38
1972	4,772	3,195	1,470	60	47
1973	4,719	3,069	1,557	51	42
1974	4,854	2,960	1,777	39	78
1975[E]	4,931	2,903	1,904	44	80
1976[E]	5,446	3,182	2,133	47	84

Sources: 1960–1969: The Budget of the United States (Annually).
1970–Date: "Aeronautics and Space Report of the President" (Annually).
NOTE: See Chapter on Research and Development for additional tables.
a Fiscal Years ending June 30.
b Excludes amount for aircraft technology beginning with 1965.
c Includes the astronautics budget activity and other activities which contribute to the space effort.
E Estimate.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
OUTLAYS AND BUDGET AUTHORITY

Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	TOTAL	Research and Development	Construction of Facilities	Research & Program Management
OUTLAYS				
1960	$ 401	$ 256	$ 54	$ 91
1961	744	487	98	159
1962	1,257	936	114	207
1963	2,552	1,912	225	416
1964	4,171	3,317	438	416
1965	5,093	3,984	531	578
1966	5,933	4,741	573	619
1967	5,426	4,487	289	650
1968	4,724	3,946	126	652
1969	4,251	3,530	65	656
1970	3,753	2,992	54	707
1971	3,382	2,630	44	708
1972	3,422	2,623	50	749
1973	3,315	2,541	45	729
1974	3,256	2,421	75	760
1975[E]	3,207	2,343	100	764
1976[E]	3,498	2,614	108	776
BUDGET AUTHORITY				
1960	$ 614	$ 333	$ 190	$ 91
1961	964	672	125	167
1962	1,825	1,285	326	214
1963	3,673	2,929	744	(b)
1964	5,099	3,890	713	496
1965	5,250	4,360	267	623
1966	5,175	4,502	61	612
1967	4,968	4,235	85	648
1968	4,589	3,912	38	639
1969	3,995	3,314	33	648
1970	3,749	2,993	53	703
1971	3,312	2,556	26	730
1972	3,308	2,523	53	732
1973	3,408	2,599	79	730
1974	3,040	2,194	101	745
1975[E]	3,231	2,323	143	765
1976[E]	3,539	2,678	85	776

Source: "The Budget of the United States" (Annually).
a Fiscal Years ending June 30.
b Included in Research & Development for one year.
E Estimate.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION RESEARCH AND DEVELOPMENT PROGRAMS BUDGET PLAN

Fiscal Years[a] 1973 to Date
(Millions of Dollars)

	1973	1974	1975[E]	1976[E]	Transition Quarter[E]
TOTAL	$2,488	$2,311	$2,323	$2,678	$ 731
MANNED SPACE FLIGHT–TOTAL	1,136	1,000	1,110	1,414	377
Space Shuttle	199	475	797	1,206	321
Space Flight Operations	879	523	311	207	55
Advanced Missions	2	2	2	1	1
Apollo	56	–	–	–	–
SPACE SCIENCE AND APPLICATIONS–TOTAL	868	823	717	758	215
Physics and Astronomy	126	94	136	156	47
Lunar and Planetary Explorations	332	392	266	260	73
Launch Vehicle Procurement	221	178	141	167	40
Space Applications	189	159	174	175	55
AERONAUTICS AND SPACE TECHNOLOGY–TOTAL	233	234	238	250	69
Aeronautical Research & Technology	151	168	167	175	47
Space & Nuclear Research & Technology	82	66	71	75	22
ENERGY PROGRAMS–TOTAL	–	5	4	6	2
TRACKING AND DATA ACQUISITION–TOTAL	248	244	248	243	66
TECHNOLOGY UTILIZATION–TOTAL	4	5	6	7	2

Source: NASA, Briefing on the Budget of the United States, February 3, 1975.
NOTE: Administrative operations costs for NASA not included.
For an explanation of the Transition Quarter, see page 25.
a Fiscal Years ending June 30.
E Estimate.

SALES AND BACKLOG OF MAJOR MANUFACTURERS SPACE VEHICLE SYSTEMS

(Excluding Engines and Propulsion Units)
Calendar Years 1961 to Date
(Millions of Dollars)

Year	Net Sales			Backlog, December 31		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1961	$ 775	$ 551	$ 224[a]	$ 586	$ 350	$ 236[a]
1962	1,319	712	607[a]	1,435	852	583[a]
1963	1,911	1,061	850	1,612	856	756
1964	2,222	732	1,490	1,611	391	1,220
1965	2,449	602	1,847	2,203	503	1,700
1966	2,710	734	1,976	1,494	428	1,066
1967	2,199	789	1,410	1,974	1,096	878
1968	2,357	899	1,458	1,329	834	495
1969	2,282	1,187	1,095	1,330	869	461
1970	1,956	1,025	931	1,184	786	398
1971	1,725	860	865	916	603	313
1972	1,656	905	751	959	646	313
1973[r]	1,562	902	660	1,177	923	254
1974	1,735	922	813	1,500	1,137	363

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).
NOTE: Based on data from about 55 companies engaged in the manufacture of aerospace products.
a Includes engines and propulsion units.
r Revised.

CHRONOLOGY OF MANNED SPACE FLIGHTS

Calendar Years 1971–1974

Launch Date	Project	Pilots	Nation	Duration
Jan 31, 1971	Apollo 14	Alan B. Shepard, Jr. Edgar D. Mitchell Stuart A. Roosa	USA	216 hr. 42 min.
Apr 22, 1971	Soyuz 10	Vladimir Shatalov Aleksey Yeliseyev Nikolai Rukavishnikov	USSR	47 hr. 46 min.
June 6, 1971	Soyuz 11	George Dobrovolsky Vladislav Volkov Viktor Patsayev	USSR	570 hr. 22 min.
July 26, 1971	Apollo 15	David R. Scott Alfred M. Worden James B. Irwin	USA	295 hr. 12 min.
Apr 16, 1972	Apollo 16	John W. Young Charles M. Duke, Jr. Thomas K. Mattingly, II	USA	265 hr. 51 min.
Dec 17, 1972	Apollo 17	Eugene A. Cernan Harrison H. Schmitt Ronald E. Evans	USA	301 hr. 52 min.
May 25, 1973	Skylab 2	Charles Conrad, Jr. Joseph P. Kerwin Paul J. Weitz	USA	672 hr. 50 min.
July 28, 1973	Skylab 3	Alan L. Bean Jack R. Lousma Owen K. Garriott	USA	1,427 hr. 9 min.
Sept 27, 1973	Soyuz 12	Vasiliy Lazarev Oleg Makarov	USSR	47 hr. 16 min.
Nov 16, 1973	Skylab 4	Gerald P. Carr Edward G. Gibson William R. Pogue	USA	2,017 hr. 16 min.
Dec 18, 1973	Soyuz 13	Petr Klimuk Valentin Lebedev	USSR	188 hr. 55 min.
July 3, 1974	Soyuz 14	Pavel Popovich Yuriy Artyukhin	USSR	377 hr. 30 min.
Aug 26, 1974	Soyuz 15	Gennadiy Sarafanov Lev Demin	USSR	48 hr. 12 min.
Dec 2, 1974	Soyuz 16	Anatoliv Filipchenko Nikolai Rukavishnikov	USSR	142 hr. 24 min.

Source: Aeronautics and Space Report of the President (Annually).
NOTE: For data for earlier years see previous editions of "Aerospace Facts and Figures."

SPACECRAFT LAUNCHINGS AS OF APRIL 13, 1975

Country	TOTAL	Payloads in Earth Orbit	Payloads Decayed	Space Probes
TOTAL	1,768	703	1,017	48
United States	803	364	414	25
U.S.S.R.	908	295	590	23
France	10	10	—	—
United Kingdom	11	8	3	—
European Space Research Organization	7	2	5	—
Canada	6	6	—	—
Japan	6	6	—	—
Italy	4	1	3	—
West Germany	4	3	1	—
Australia	2	1	1	—
People's Republic of China	2	2	—	—
N.A.T.O.	2	2	—	—
Netherlands	1	1	—	—
Spain	1	1	—	—
France/Germany	1	1	—	—

Source: National Aeronautics and Space Administration.

U.S. MAN-HOURS SPACE FLIGHT TIME LOG

Calendar Years 1961-1973

Mission	Launch Date	Man-Hours in Mission		Total Cumulative Time	
		Hrs.	Min.	Hrs.	Min.
MR-3 (Shepard)	May 5, 1961	—	15	—	15
MR-4 (Grissom)	July 21, 1961	—	16	—	31
MA-6 (Glenn)	Feb 20, 1962	4	55	5	26
MA-7 (Carpenter)	May 24, 1962	4	56	10	22
MA-8 (Schirra)	Oct 3, 1962	9	13	19	35
MA-9 (Cooper)	May 15, 1963	34	20	53	55
Gemini 3 (Grissom, Young)	Mar 23, 1965	9	46	63	41
Gemini 4 (McDivitt, White)	June 3, 1965	195	52	259	33
Gemini 5 (Cooper, Conrad)	Aug 21, 1965	381	50	641	23
Gemini 6 (Schirra, Stafford)	Dec 15, 1965	51	42	693	05
Gemini 7 (Borman, Lovell)	Dec 4, 1965	661	10	1,354	15
Gemini 8 (Armstrong, Scott)	Mar 16, 1966	21	21	1,375	36
Gemini 9 (Stafford, Cernan)	June 3, 1966	144	42	1,520	32
Gemini 10 (Young, Collins)	July 18, 1966	141	34	1,662	06
Gemini 11 (Conrad, Gordon)	Sept 12, 1966	142	34	1,804	40
Gemini 12 (Lovell, Aldrin)	Nov 11, 1966	189	10	1,993	50

(Continued on the next page)

U.S. MAN-HOURS SPACE FLIGHT TIME LOG

(Continued)

Mission	Launch Date	Man-Hours in Mission		Total Cumulative Time	
		Hrs.	Min.	Hrs.	Min.
Apollo 7 (Schirra, Eisele, Cunningham)	Oct 11, 1968	780	27	2,774	17
Apollo 8 (Borman, Lovell, Anders)	Dec 21, 1968	441	03	3,215	20
Apollo 9 (McDivitt, Scott, Schweikart)	Mar 3, 1969	723	03	3,938	23
Apollo 10 (Stafford, Young, Cernan)	May 18, 1969	576	09	4,514	32
Apollo 11 (Armstrong, Collins, Aldrin)	July 16, 1969	585	57	5,100	29
Apollo 12 (Conrad, Gordon, Bean)	Nov 14, 1969	733	48	5,834	17
Apollo 13 (Lovell, Haise, Swigert)	Apr 11, 1970	428	45	6,623	02
Apollo 14 (Shepard, Roosa, Mitchell)	Jan 31, 1971	650	06	6,913	08
Apollo 15 (Scott, Worden, Irwin)	July 26, 1971	885	36	7,808	44
Apollo 16 (Young, Duke, Mattingly)	Apr 16, 1972	797	33	8,606	17
Apollo 17 (Cernan, Schmitt, Evans)	Dec 7, 1972	905	36	9,511	53
Skylab 2 (Conrad, Kerwin, Weitz)	May 25, 1973	2,018	30	11,530	29
Skylab 3 (Bean, Lousma, Garriott)	July 28, 1973	4,287	27	15,817	56
Skylab 4 (Carr, Gibson, Pogue)	Nov 16, 1973	6,051	48	21,869	44

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

MAJOR UNITED STATES LAUNCHINGS, 1974

Date	Designation	Objective
Jan. 18	Skynet II-A	To launch spacecraft into a synchronous equatorial transfer orbit with sufficient accuracy to enable the spacecraft to accomplish its operational missions. Failure due to short circuit in electronics package.
Feb. 11	Centaur Proof	To demonstrate the capability of the Titan III E Centaur D-1T launch vehicle, the Centaur Standard Shroud and the ability of the Integrate, Transfer Launch Facility to support operational Titan/Centaur missions. Vehicle failure. Centaur stage did not burn as programmed.
Feb. 18	San Marco C-2 (San Marco-4)	To obtain measurements of the diurnal variations of the equatorial neutral atmosphere density, composition and temperature.
Mar. 8	UK-X4	To demonstrate an accuracy of better than 3 arc minutes using a gas jet system; to measure the performance in orbit of components of an operational infrared sensor; to check photometric calibration of the sensor to measure the density of sun-reflecting particles near the spacecraft. (Reimbursable)
Apr. 13	WESTAR-A (Western Union)	To place satellite into a synchronous transfer orbit designed to provide transmission of television, voice, data, etc., throughout the USA. (Reimbursable)
May 17	SMS-A (1)	Part of a global network of geostationary environmental satellites with the objective of providing earth imaging in the visible and IR spectrums, monitoring space environment.
May 30	ATS-F (6)	To inject spacecraft into a near geostationary orbit; to erect large antenna structure capable of providing good quality TV signal to small, inexpensive ground receivers to stabilize the spacecraft using a 3-axis control system.
Jun. 3	Hawkeye (Explorer 52)	To study the plasma properties of the magnetosphere in the vicinity of the magnetic neutral point over the Earth's north polar cap.

(Continued on next page)

MAJOR UNITED STATES LAUNCHINGS, 1974 (Continued)

Date	Designation	Objective
Jul. 16	AEROS-B (2)	To measure the main aeronomic parameters determining the state of the upper atmosphere and the solar ultraviolet radiation in the wavelength band of main absorption.
Aug. 30	ANS-A (1)	Obtain specral distribution and other data from celestial X-ray and ultraviolet sources. Cooperative program with the Netherlands.
Oct. 10	WESTAR-B (2)	Domestic Communications Satellite. Reimbursed and operated by Western Union.
Oct. 15	UK-5 (AERIEL 5)	To investigate galactic and extragalactic X-ray sources.
Nov. 15	ITOS-G (NOAA-4) INTASAT (Piggyback on ITOS-G)	Meteorological Satellite constructed and launched by NASA; reimbursed and operated by NOAA. Scientific Satellite to measure total electron content, ionospheric irregularities and ionospheric scintillations. Cooperative with Spain.
Nov. 21	INTELSAT IV F-8	Communications Satellite reimbursed and operated by Comsat to expand the global satellite system.
Nov. 22	Skynet II-B (UK)	Communications Satellite: United Kingdom reimbursable to provide X-Band military communications.
Dec. 10	Helios-A	Scientific Satellite to investigate the properties of and processes in interplanetary space in the direction of and close to the Sun. Cooperative with West Germany.
Dec. 17	Symphonie-A	Communications Satellite. A joint project by France and Germany to provide communications to Europe, Africa and South America. (Reimbursable)

Source: National Aeronautics and Space Administration, "Historical Pocket Statistics," January 1975.
NOTE: For data for earlier years, see previous editions of "Aerospace Facts and Figures."

UNITED STATES SPACE LAUNCH VEHICLES

Vehicle	Stages	Thrust (in thousands of pounds)	Payload (Pounds)	
			300 Nautical Miles Orbit	Escape
Scout	1. Algol IIIA*	108.3	410	85
	2. Castor IIA*	63.2		
	3. Antares IIB*	28.5		
	4. Altair III*	5.9		
Thor-Delta 2900 Series	1. Thor plus nine TX354-5*	205 plus 99	3,900	1,050
	2. Delta (DSV-3)	10.3		
	3. TE 364-4*	15		
Atlas-Agena	1. Atlas Booster and Sustainer (SLV-3A)	503	7,700	1,430
	2. Agena	16		
Titan IIIB-Agena	1. LR-87	464	7,200	1,500
	2. LR-91	102		
	3. Agena	16		
Titan IIIC	1. Two 5-segment 120" diameter*	2,400	27,700	6,900
	2. LR-87	520		
	3. LR-91	102		
	4. Transtage	15.7		
Titan IIID	1. Two 5-segment 120" diameter*	2,400	40,500	—
	2. LR-87	520		
	3. LR-91	102		
Titan IIIE Centaur	1. Two 5-segment 120" diameter*	2,400	—	11,300
	2. LR-87	520		
	3. LR-91	102		
	4. Centaur (Two RL-10)	30		
Atlas-Centaur	1. Atlas Booster and Sustainer	503	10,300	2,500
	2. Centaur (Two RL-10)	30		
Saturn IB	1. S-IB (8H-1)	1,640	34,000	
	2. S-IVB (1J-2)	230		

Source: Aeronautics and Space Report of the President (Annually).
* Solid propellant, all others are liquid.

Air Transportation

The air transportation industry started the year with a dim outlook occasioned by worldwide recession and inflation coupled with higher fares brought on by soaring fuel costs and other increases in operating expenses. For these and other reasons there were many who felt that 1974 would be a zero-growth year. Although the growth rate was lower than in recent years, there was an increase in passenger-miles flown by the world's airlines. Passenger-miles climbed close to the 400 billion mark, and cargo ton-miles approached 14 billion.

The experience of the U.S. scheduled airlines was similar, with net profits reaching the fourth best level in U.S. airline history. Profits stemmed from two fare increases granted by the Civil Aeronautics Board (CAB) together with a variety of measures designed to reduce operating costs sharply as a counteragent to enormously increased outlays for fuel. CAB estimates the industry's net profits for the year at $381 million.

Most of the gains in revenues and profits were recorded during the first four

months of the year. Paradoxically, they came about as a result of the fuel crisis which forced the carriers to ground many of their planes.

Surprisingly, traffic levels not only held up, they increased during those four months, primarily due to the fact that fuel scarcity led many travelers who would have gone by auto to turn to air transportation. The Air Transport Association estimated that passenger diversion from highways brought a 5 to 6 percent increase in traffic volume. With more people flying in fewer airplanes, load factors increased, running as high as 60 to 65 percent during the January-April period, compared with 52 percent for the same period in 1973. This brought a large gain in revenues coupled with lower operating costs because there were fewer airplanes in service. The result was a profit for the four months. When fuel became available to motorists, auto diversion traffic dropped off and for the remainder of the year the airlines operated at or near 1973 levels.

For the year as a whole, U.S. scheduled domestic airlines flew a new high of nearly 130 billion passenger-miles, up 340 million from 1973. The number of passengers carried increased by about 6.5 million.

The U.S. flag international lines did not fare as well, particularly on the North Atlantic routes. The U.S. is the major source of traffic generation for the North Atlantic and with inflation rates higher in many European nations than in the U.S., American travelers apparently decided to vacation at home or elsewhere abroad. As a result. U.S. flag carriers suffered heavy losses in North Atlantic operations and overall losses of enormous dimension. International passenger traffic carried by U.S. airlines declined by 2.5 billion passenger-miles below the 1973 figure. This marked the first drop since 1970 after three years of solid gains in the international market.

One interesting aspect of 1974 operations was the gain in U.S. air cargo volume. There, too, zero growth or a possible reduction appeared imminent; but an odd situation developed whereby the recession proved beneficial to cargo sales. Airline operators found that, with money tight and interest rates high, manufacturers could not afford large inventories. Seeking to move their products more quickly, many manufacturers turned to air freight; thus, instead of the anticipated downturn, there was a gain of 1.4 billion ton-miles worldwide and a substantial increase in revenues.

U. S. MANUFACTURED TRANSPORT AIRCRAFT

In Operation on World Civil Airlines, By Model
Calendar Years 1969 to Date

	1969	1970	1971	1972[r]	1973
TOTAL, MANUFACTURED IN U.S.	3,030	3,042	3,094	3,247	3,310
Four-Engine, TOTAL	1,428	1,493	1,490	1,417	1,382
Turbojets	1,221	1,318	1,355	1,309	1,289
Boeing 707	600	604	584	568	570
Boeing 720/720B	113	101	106	57	41
Boeing 747	4	89	163	191	211
McDonnell Douglas DC-8	437	465	451	445	431
Convair 880	47	45	41	41	29
Convair 990	20	14	10	7	7
Turboprops	62	55	42	34	35
Lockheed Electra	59	51	38	31	32
Lockheed L-100 Hercules	3	4	4	3	3
Piston Engine	145	120	93	74	58
Lockheed Constellation	3	1	—	—	—
Douglas DC-7	3	1	1	—	—
Douglas DC-6	72	58	43	38	26
Douglas DC-4	67	60	49	36	32
Three-Engine, TOTAL	671	713	738	870	989
Turbojets	671	713	738	870	989
Boeing 727	671	713	725	790	868
McDonnell Douglas DC-10	—	—	13	63	70
Lockheed L-1011	—	—	—	17	51
Twin-Engine, TOTAL	902	815	826	899	867
Turbojets	498	547	595	662	667
Boeing 737	124	143	154	160	170
Lear Jet 24	1	—	—	—	—
McDonnell Douglas DC-9	373	404	441	501	497
Lockheed Jetstar	—	—	—	1	—
Turboprops	26	24	30	52	55
Fairchild F-27/F-227	21	17	23	6	9
Convair 640/580	5	4	5	43	45
Other	—	3	2	3	1
Piston Engine	378	244	201	185	144
Convair 240, 340, 440	100	53	43	28	19
Curtiss Commando C-46	18	7	2	1	1
Douglas DC-3/C-47	237	164	137	118	86
Other	23	20	19	38	38
Single-Engine, TOTAL	14	4	25	47	60
Helicopters	15	17	15	14	12
All Manufacturers, Grand Total	3,999	3,983	3,973	4,097	4,225
Percent of Grand Total Manufactured in U.S.	75.8	76.4	77.9	79.3	78.3

Source: International Air Transport Association, "World Air Transport Statistics" (Annually).
NOTE: Excludes U.S.S.R., People's Republic of China and non-IATA members.
r Revised.

AIRLINE TRAFFIC
WORLD SCHEDULED AIRLINES

Calendar Years 1960 to Date
(Millions)

Year	Miles Flown	Passengers Carried	Passenger-Miles	Cargo Ton-Miles	Mail Ton-Miles
	Excludes U.S.S.R.				
1960	1,930	106	67,500	1,400	415
1961	1,940	111	72,500	1,615	490
1962	2,015	121	80,500	1,900	555
1963	2,130	135	91,500	2,130	590
1964	2,300	155	106,000	2,575	625
1965	2,550	177	123,000	3,290	755
1966	2,780	200	142,000	3,905	1,050
1967	3,280	233	169,500	4,470	1,295
1968	3,730	261	192,500	5,425	1,610
1969	4,170	293	218,000	6,685	1,720
1970	4,360	311	237,000	7,165	1,885
1971[r]	4,390	333	252,000	7,870	1,750
1972[r]	4,490	368	289,000	9,060	1,660
1973[r]	4,680	405	323,000	10,680	1,700
1974[E]	4,430	418	335,000	11,950	1,660
	Includes U.S.S.R.				
1970[r]	N.A.	382	286,000	8,180	2,150
1971[r]	N.A.	411	307,000	8,990	1,970
1972[r]	N.A.	450	348,000	10,230	1,900
1973[r]	N.A.	489	385,000	12,015	1,970
1974[E]	N.A.	505	399,000	13,460	1,960

Source: International Civil Aviation Organization, "Development of World Scheduled Revenue Traffic" (Annually).

NOTE: Excludes the People's Republic of China, and states which were not members of ICAO on December 31, 1974. Figures represent revenue traffic on international and domestic scheduled services.

r Revised.
E Estimate.
N.A. Not available.

U. S. AIRLINE FLEET
TYPE OF AIRCRAFT, NUMBER OF ENGINES AND MODEL

As of December 31
(Number of Aircraft)

Type of Aircraft, Number of Engines and Model	Year				
	1970	1971	1972	1973	1974
TOTAL AIRCRAFT	2,679	2,642	2,583	2,599	2,472
Four-Engine, TOTAL	1,075	1,010	917	866	730
Turbojets	931	890	811	750	632
Boeing 707	406	365	342	316	281
Boeing 720	115	106	57	45	35
Boeing 747	79	104	106	111	104
Convair 880	41	41	41	37	–
Convair 990	5	8	8	8	5
Lockheed L-1329	–	1	1	–	1
McDonnell Douglas DC-8	285	265	256	233	206
Turboprops	110	89	79	74	67
Armstrong Whitworth AW-650	8	6	–	–	–
Boeing 377S	–	1	1	1	–
Canadair CL-44	8	1	–	–	–
Lockheed 188	69	60	57	53	48
Lockheed 382	22	21	21	20	19
Vickers Viscount	3	–	–	–	–
Piston-Engine	34	31	27	42	31
Boeing 377	2	1	1	1	–
Douglas DC-4	8	4	3	4	1
Douglas DC-6	17	17	21	31	28
Douglas DC-7	6	7	–	5	1
Lockheed 749	1	1	1	–	–
Lockheed 1049/1649	–	1	1	1	1
Three-Engine, Turbojets, TOTAL	659	678	759	872	923
Boeing 727	659	665	683	733	747
Lockheed L-1011	–	–	17	48	68
McDonnell Douglas DC-10	–	13	59	91	108
Twin-Engine, TOTAL	915	926	880	833	797
Turbojets	546	564	548	523	523
Boeing 737	149	155	153	152	150
British Aircraft Corp., BAC-111	59	62	58	31	36
Dassault MD-20	–	5	2	–	–
Lear Jet LR-23	–	–	–	–	3
McDonnell Douglas DC-9	337	341	335	340	334
Hamburger Flugzeubau HF-320	1	1	–	–	–

(Continued on next page)

U. S. AIRLINE FLEET
TYPE OF AIRCRAFT, NUMBER OF ENGINES AND MODEL (Continued)

Type of Aircraft, Number of Engines and Model	Year				
	1970	1971	1972	1973	1974
Twin-Engine, continued					
Turboprops	259	258	239	230	199
Aero Commander AC-680-V	—	—	1	1	—
Beech 99	3	5	1	—	—
Convair 580	108	106	104	105	89
Convair 600, 640	34	33	34	32	29
DeHavilland DHC-6	6	8	13	9	8
Fairchild F-27	37	34	29	25	15
Fairchild FH-227	47	48	32	31	33
Grumman G-159	1	1	1	1	1
Hawker Siddley HS748	—	—	—	1	1
Nihon YS-11	21	21	22	23	21
Short SC-7	2	2	2	2	2
Piston-Engine	110	104	93	80	75
Aero Commander 500	—	1	1	1	1
Aero Commander 680E	1	2	1	—	1
Beech BE-18	—	—	—	—	1
Beech BE-50	—	—	1	—	—
Cessna CE-310	—	—	—	1	1
Cessna 402	1	1	3	2	1
Convair 240	—	—	1	—	—
Convair 340/440	6	5	7	6	6
Curtis CW-46	42	31	22	30	25
Douglas DC-3	22	23	20	12	14
Fairchild FC-82	2	2	2	2	2
Grumman G-21	12	12	11	6	6
Grumman G-44	2	2	1	1	1
Grumman G-73	1	1	1	1	1
Martin 202	1	1	1	—	—
Martin 404	19	22	21	18	15
Piper PA-23	1	1	—	—	—
Single-Engine, TOTAL	14	14	13	15	12
Turboprops	5	3	—	—	—
Piston-Engine	9	11	13	15	12
Helicopters, TOTAL	16	14	14	13	10
Turbine-Engine	13	11	11	10	10
Sikorsky S-61	6	8	7	7	7
Bell BL-206	3	3	4	3	3
Vertol V-107 II	4	—	—	—	—
Piston-Engine	3	3	3	3	—
Sikorsky S-58C	3	3	3	3	—

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

AIRLINE TRAFFIC
UNITED STATES SCHEDULED AIRLINES

Calendar Years 1960 to Date
(Millions)

Year	Miles Flown	Passengers Carried	Passenger-Miles	Cargo Ton-Miles[a]	Mail Ton-Miles[b]
1960	998	58	38,863	880	250
1961	970	58	39,831	1,023	308
1962	1,010	63	43,760	1,388	350
1963	1,095	71	50,365	1,346	368
1964	1,189	82	58,494	1,634	383
1965	1,354	95	68,676	2,270	494
1966	1,482	109	79,889	3,048	762
1967	1,834	132	98,484	3,537	985
1968	2,146	150	113,958	3,872	1,268
1969	2,385	159	125,414	4,443	1,345
1970	2,418	170	131,710	3,862	1,484
1971	2,379	174	135,652	4,637	1,327
1972	2,376	191	152,406	5,198	1,205
1973	2,448	202	161,957	5,283	1,209
1974	2,258	207	162,917	5,332	1,163

Source: Civil Aeronautics Board, Bureau of Accounts and Statistics.
NOTE: Figures represent total scheduled service excluding nonrevenue operations of U.S. International and domestic certificated route air carriers.

a Includes freight plus express revenue ton-miles in scheduled and nonscheduled operations.

b U.S. mail ton-miles plus foreign mail ton-miles in scheduled and nonscheduled operations.

PASSENGER SERVICE
U. S. SCHEDULED AIRLINES
Calendar Years 1950 to Date

Year	Domestic		International	
	Passenger-Miles Flown (Millions)	Passengers Carried (Thousands)	Passenger-Miles Flown (Millions)	Passengers Carried (Thousands)
1950	8,029.1	17,468	2,214.0	1,752
1951	10,589.7	22,711	2,613.8	2,140
1952	12,559.3	25,176	3,065.0	2,391
1953	14,793.9	28,901	3,450.8	2,745
1954	16,802.4	32,529	3,810.4	2,919
1955	19,852.1	38,221	3,398.9	3,488
1956	22,398.6	41,937	5,226.2	4,068
1957	25,378.8	45,162	5,882.0	4,259
1958	25,375.5	44,741	6,123.9	4,428
1959	29,307.6	51,000	7,064.2	4,999
1960	30,556.6	52,377	8,306.2	5,499
1961	31,062.3	52,712	8,768.5	5,699
1962	33,623.0	55,950	10,138.0	6,598
1963	38,456.6	63,925	11,905.4	7,513
1964	44,141.3	72,988	14,352.4	8,775
1965	51,887.4	84,460	16,789.0	10,195
1966	60,590.8	97,746	19,298.4	11,646
1967	75,487.3	118,669	23,259.3	13,424
1968	87,507.6	134,423	26,450.6	15,728
1969	95,945.8	142,340	29,468.3	16,848
1970	104,146.8	153,662	27,563.2	16,260
1971	106,293.9	156,098	29,357.9	17,569
1972	118,138.0	172,452	34,268.3	18,897
1973	126,317.3	183,272	35,640.0	18,936
1974	129,731.0	189,724	33,186.2	17,725

Source: Civil Aeronautics Board, Bureau of Accounts and Statistics.
NOTE: Figures represent total scheduled passenger services excluding nonrevenue operations of certificated route air carriers.

U. S. DOMESTIC AIRLINES[a]
TOTAL ASSETS AND INVESTMENT IN FLIGHT EQUIPMENT

Fiscal Years[b] 1960 to Date
(Millions of Dollars)

Year	TOTAL NET ASSETS[c]	Value of Flight Equipment				Investment in Flight Equipment as a Percent of Total Assets
		TOTAL Gross Value	Less: Depreciation	Plus: Construction Work in Process	Equals: Net Value of Flight Equipment	
1960	$ 1,760	$ 2,174	$ 890	$ 90	$ 1,374	78.1%
1961	2,099	2,719	1,062	77	1,734	82.6
1962	2,273	3,006	1,183	52	1,875	82.4
1963	2,211	3,132	1,341	27	1,818	82.2
1964	2,415	3,383	1,402	48	2,029	84.0
1965	2,816	3,844	1,505	52	2,391	84.9
1966	3,747	4,520	1,646	107	2,981	79.6
1967	5,003	5,485	1,805	153	3,833	76.6
1968	6,294	6,936	2,044	204	5,096	76.6
1969	7,107	8,003	2,334	195	5,864	82.5
1970	7,417	8,546	2,814	298	6,030	81.3
1971	7,664	9,375	3,231	203	6,347	82.8
1972	8,017	9,813	3,484	200	6,529	81.4
1973[r]	9,692	12,140	4,423	344	8,061	83.2
1974	10,024	13,010	4,756	155	8,409	83.8

Source: Civil Aeronautics Board, Bureau of Accounts and Statistics.
a 1960 through 1972: includes data for trunk and local service carriers only; international carriers, helicopter service and air taxi operators excluded.
1973 and 1974: Pan American Airlines is reclassified as a trunk carrier and is included in the statistics published by the Bureau of Accounts and Statistics of the Civil Aeronautics Board.
b Fiscal Years ending June 30.
c Comprises net investment in buildings and ground equipment, flight equipment, working capital, etc.
r Revised to include Pan American Airlines.

REVENUES AND EXPENSES
TOTAL DOMESTIC OPERATIONS[a], ALL AIR CARRIER SERVICES

Calendar Years 1960 to Date
(Millions of Dollars)

Year	TOTAL Operating Revenues	TOTAL Operating Expenses	Operating Profit
1960	$ 2,129	$ 2,091	$ 38
1961	2,245	2,244	1
1962	2,498	2,408	90
1963	2,722	2,580	142
1964	3,094	2,778	316
1965	3,608	3,165	443
1966	4,070	3,589	481
1967	4,887	4,476	411
1968	5,606	5,298	308
1969	6,438	6,156	282
1970	7,131	7,128	3
1971	7,753	7,496	257
1972	8,652	8,158	493
1973	9,694	9,200	494
1974	11,545	10,760	785

Source: Civil Aeronautics Board, Bureau of Accounts and Statistics.
NOTE: Figures before 1961 do not include items of ground and indirect expense.
a Includes domestic trunks, local service, Intra-Alaska, Intra-Hawaii, helicopter, other carriers and all-cargo carriers.
r Revised.

SOURCES OF OPERATING REVENUE
TOTAL DOMESTIC OPERATIONS[a], ALL AIR CARRIER SERVICES

Calendar Years 1960 to Date
(Millions of Dollars)

Year	TOTAL Operating Revenues	Passenger	Mail (including subsidy)	Express and Freight	Excess Baggage	Other
1960	$ 2,129	$ 1,860	$ 113	$ 103	$ 21	$ 32
1961	2,245	1,951	130	115	20	29
1962	2,498	2,168	139	136	20	35
1963	2,722	2,375	143	152	17	35
1964	3,095	2,701	149	182	17	46
1965	3,608	3,142	157	220	12	77
1966	4,070	3,534	162	251	6	117
1967	4,887	4,260	170	287	7	163
1968	5,606	4,913	182	343	9	159
1969	6,438	5,662	186	401	10	179
1970	7,131	6,246	205	461	12	207
1971	7,753	6,736	227	527	13	250
1972	8,652	7,565	230	596	13	248
1973	9,694	8,379	263	694	14	344
1974	11,545	9,758	264	759	17	747

Source: Civil Aeronautics Board, Bureau of Accounts and Statistics.
NOTE: Figures before 1961 do not include items of ground and indirect expense.
a Includes domestic trunks, local service, Intra-Alaska, Intra-Hawaii, helicopter, other carriers and all-cargo carriers.
r Revised.

U. S. CIVIL AND JOINT CIVIL-MILITARY AIRPORTS

By Length of Runway and Region[a]
December 31, 1973

FAA Region	TOTAL	Airports by Length of Runway (in feet)		
		Under 5,000	5,000-9,999	10,000 & Over
TOTAL	12,700	11,156	1,268	276
New England	481	396	58	27
Eastern	1,631	1,492	110	29
Great Lakes	2,490	2,283	163	44
Central	1,197	1,124	65	8
Southern[b]	1,409	1,213	184	12
Southwest	2,020	1,800	196	24
Rocky Mountain	872	729	136	7
Western	1,063	889	154	20
Northwest	712	627	72	13
Alaska	766	562	114	90
Pacific	46	38	7	1
Outside U.S.[c]	13	3	9	1

Source: Department of Transportation, Federal Aviation Administration.
a Includes seaplane bases, heliports and military fields having joint civil-military use.
b Includes Puerto Rico (20 airports) and the Virgin Islands (4 airports).
c American Samoa, Guam and Saipan.

ACTIVE CIVIL AIRCRAFT

as of December 31
Years 1960 to 1973[a]

Year	Active Civil Aircraft							
	TOTAL	TOTAL Air Carrier[b]	General Aviation Aircraft					
			TOTAL	Fixed-Wing Aircraft			Rotorcraft[c]	Other[d]
				Multi-Engine	Single-Engine			
					4-place & over	3-place & less		
1960	78,760	2,211	76,549	7,243	34,829	33,472	634	371
1961	82,853	2,221	80,632	8,401	38,206	32,800	798	427
1962	86,287	2,166	84,121	9,186	41,120	32,341	967	507
1963	87,267	2,179	85,088	9,695	42,657	30,977	1,171	588
1964	90,935	2,193	88,742	10,644	45,777	30,367	1,306	648
1965	97,741	2,299	95,442	11,977	49,789	31,364	1,503	809
1966	107,085	2,379	104,706	13,548	52,972	35,687	1,622	877
1967	116,781	2,595	114,186	14,651	56,865	39,675	1,899	1,096
1968	127,164	2,927	124,237	16,760	60,977	42,830	2,350	1,320
1969	133,814	3,008	130,806	18,111	63,703	45,001	2,557	1,434
1970[r]	134,539	2,796	131,743	18,291	64,759	44,884	2,255	1,554
1971[r]	133,869	2,721	131,148	17,855	64,464	44,792	2,352	1,685
1972	147,695	2,685	145,010	19,849	70,998	49,448	2,787	1,928
1973	156,207	2,667	153,540	21,929	74,831	51,386	3,143	2,251

Source: Federal Aviation Administration.
NOTE: As of January 1971 the definition used for determining the active general aviation fleet was changed. Formerly an active aircraft was one certificated as eligible to fly. Now an active aircraft must have a current registration and have been flown during the previous calendar year.

a Latest information released by the Federal Aviation Administration.
b Registered, not necessarily in operation. Includes helicopters.
c Includes autogiros; excludes air carrier helicopters.
d Includes gliders, dirigibles, and balloons.
r Revised.

ACTIVE AIRMAN CERTIFICATES HELD

as of December 31
1960 to Date

Year	Pilots						Non-Pilots[a]	Other[b]
	TOTAL	Students	Private	Commercial	Airline	Other		
1960	348,062	99,182	138,869	89,904	18,279	1,828	169,598	94,723
1961	352,860[E]	93,973	144,312[E]	92,976[E]	19,155[E]	2,444[E]	175,287[E]	98,257[E]
1962	365,971	95,870	149,755	96,047	20,032	4,267	181,982	101,793
1963	378,700	105,298	152,209	96,341	20,269	4,583	186,304	83,800
1964	431,041	120,743	175,574	108,428	21,572	4,724	195,396	116,600
1965	479,770	139,172	196,393	116,665	22,440	5,100	204,463	128,541
1966	548,757	165,177	222,427	131,539	23,917	5,697	217,132	146,068
1967	617,931	181,287	253,312	150,135	25,817	7,380	231,801	166,994
1968	691,695	209,406	281,728[c]	164,458	28,607	7,496	250,151	169,707
1969	720,028	203,520	299,491	176,585	31,442	8,990	269,775	189,871
1970	732,729	195,861	303,779	186,821	34,430	11,838	289,681	207,670
1971	741,009	186,428	312,656	192,409	35,949	13,567	307,057	217,021
1972	750,869	181,477	321,413	196,228	37,714	14,037	319,177	225,767
1973[d]	714,607	181,905	298,921	182,444	38,139	13,198	304,147	222,491
1974	733,728	180,795	305,848	192,425	41,002	13,658	314,394	241,741

Source: Federal Aviation Administration, Office of Management Systems.
a "Non-Pilots" includes mechanics, parachute riggers, ground instructors, dispatchers, control tower operators, flight navigators and flight engineers.
b "Other" includes instrument ratings and flight instructor certificates.
c Includes special certificates issued to foreign nationals.
d The decrease in 1973 data is due to a change in computer systems and subsequent refinement of the data files.
E Estimate.

GENERAL AVIATION
MILES AND HOURS FLOWN

By Type of Flying
Calendar Years 1960-1973[a]

Year	TOTAL	Business		Commercial		Instructional		Personal & Other	
		Units	Per-cent	Units	Per-cent	Units	Per-cent	Units	Per-cent
MILES FLOWN BY TYPE OF FLYING—MILLIONS OF MILES									
1960	1,769	881	50	299	17	194	11	395	22
1961	1,858	888	48	333	18	203	11	434	23
1962	1,965	935	48	367	18	256	13	407	21
1963	2,049	983	48	369	18	266	13	431	21
1964	2,181	1,047	48	393	18	284	13	457	21
1965	2,562	1,204	47	461	18	359	14	538	21
1966	3,336	1,536	46	516	16	646	19	638	19
1967	3,440	1,431	42	569	16	713	21	727	21
1968	3,701	1,406	38	666	18	814	22	815	22
1969	3,926	1,426	36	723	19	910	23	867	22
1970[r]	3,207	1,134	35	555	17	686	22	832	26
1971[r]	3,143	1,129	36	506	16	651	21	857	27
1972	3,317	1,144	34	581	18	692	21	900	27
1973	3,729	1,344	36	688	18	778	21	919	25
HOURS FLOWN BY TYPE OF FLYING—THOUSANDS OF HOURS									
1960	13,121	5,699	44	2,365	18	1,828	14	3,229	24
1961	13,602	5,699	42	2,634	19	1,796	13	3,473	26
1962	14,500	5,431	38	3,051	21	2,385	16	3,633	25
1963	15,106	5,740	38	3,172	21	2,417	16	3,777	25
1964	15,738	5,823	37	3,305	21	2,675	17	3,935	25
1965	16,733	5,857	35	3,348	20	3,346	20	4,182	25
1966	21,023	7,057	33	3,555	17	5,674	27	4,737	23
1967	22,153	6,578	30	3,918	18	6,262	28	5,395	24
1968	24,053	6,976	29	4,810	20	6,494	27	5,773	24
1969	25,351	7,064	28	4,928	19	7,023	28	6,336	25
1970[r]	26,030	7,204	28	4,582	18	6,791	26	7,453	28
1971[r]	25,512	7,141	28	4,264	17	6,416	25	7,691	30
1972	26,974	7,239	27	4,831	18	6,814	25	8,090	30
1973	30,048	8,558	28	5,608	19	7,646	25	8,236	28

Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Annually).
a Latest information released by Federal Aviation Administration.
r Revised.

Helicopters

Traffic on U.S. scheduled helicopter airlines was down slightly but gains were recorded in other areas of civil helicopter usage, particularly among federal, state and local government agencies. Attracted by the utility of the helicopter in traffic control, rescue, and crime control, more than a score of municipalities in the U.S. and Canada joined the continually growing list of helicopter users. By year-end the number of government agencies using helicopters reached a high of 200. Increased activity in oil exploration, triggered by the energy crunch, also increased demand for medium and large helicopters.

The current accent on ecology is playing a part in increased use of helicopters in the lumber industry. More and more companies are using helicopters to lift in crews, harvest selected trees, lift out the logs and re-seed. Other areas of expanded civil helicopter usage included bank courier service and heavy construction tasks.

The total number of civil helicopters operated in the U.S. and Canada increased by more than 200 in 1974 to 4,819. The largest gain, 123, was in

commercial helicopters; expanded government usage accounted for the balance of the increase. Corporate service remained at about the previous year's level.

Growth in the number of operators in the U.S. and Canada was negligible in 1974. Today there are 33 commercial operators in the U.S. and Canada operating ten or more helicopters and 24 with fleets ranging from 20 to over 200. The addition of four operators in 1974 brings the total to 1,536.

Production of civil helicopters set new records in 1974 both in numbers and in value of shipments. Six U.S. rotary-wing manufacturers produced 828 helicopters valued at $189 million, representing a 56 percent increase in dollar value and 7.5 percent increase in numbers, compared with the previous year. Of the 828 machines built, 51 percent were exported.

The number of heliports, which has increased consistently over the years, rose sharply. Heliports in the U.S., Canada and Puerto Rico passed the 3,000 mark in 1974 to 3,014, a gain of more than 25 percent over 1973, when heliports totaled 2,384.

A significant event in the vertical lift community during 1974 was the milestone development and successful demonstration of a completely new type of control system. Known as "fly-by-wire," the system uses electrical signals to replace the rods, cranks, cables and pulleys used on large helicopters, thus reducing complexity, weight and space while allowing for more precise control. Although developed for the military, the system has applicability in commercial helicopters.

Another development was approved by the Federal Aviation Administration which allows for the first time operation of certain transport helicopters under Instrument Flight Rules conditions. A special federal air regulation providing for limited IFR operations was prepared late in the year and formally promulgated early in 1975. In the same area, the year saw certification of a new flight control system (HelCIS) which permits single-pilot IFR operations.

During 1974, two other announcements concerning helicopters are important. Developmental work started on the new transport, S-65C, while production was initiated on a new light twin-engine craft, the Model 222.

CIVIL HELICOPTER OPERATORS AND HELICOPTERS OPERATED IN THE UNITED STATES AND CANADA

1960 to Date

Year	TOTAL	Users		
		Commercial	Companies and Executives	Government Agencies[a]
CIVIL HELICOPTER OPERATORS				
1960	318	193	94	31
1961	406	265	106	35
1962	503	322	145	36
1963	600	405	150	45
1964	710	451	212	47
1965	860	508	299	53
1966	933	519	353	61
1967	1,023	522	427	74
1969	1,379	689	596	94
1971	1,424	672	590	162
1972	1,491	758	566	167
1973	1,532	752	599	181
1974	1,536	725	608	203
HELICOPTERS OPERATED[b]				
1960	936	705	134	97
1961	1,179	882	173	124
1962	1,319	994	213	112
1963	1,497	1,157	218	122
1964	1,767	1,333	311	123
1965	2,053	1,537	401	115
1966	2,318	1,699	475	144
1967	2,438	1,764	487	187
1969	3,433	2,390	770	273
1971	3,874	2,605	802	467
1972	4,185	2,992	745	448
1973	4,601	3,295	780	526
1974	4,819	3,418	778	623

Source: Aerospace Industries Association, Manufacturers' and owner/operators' reports.
a Federal, state and local governments.
b Totals include helicopters on order.

HELIPORTS AND HELISTOPS IN THE UNITED STATES, CANADA, AND PUERTO RICO

By Region
Selected Years 1968 to Date

Region	1968	1970	1972	1973	1974
TOTAL	1,892	2,310	2,326	2,384	3,014
(elevated)	(158)	(216)	(211)	(241)	(221)
New England	138	93	87	78	106
Middle Atlantic	346	514	571	581	741
East North Central	258	293	281	307	359
West North Central	81	107	109	110	111
South Atlantic	157	192	190	204	301
East South Central	41	47	65	64	86
West South Central	195	205	216	217	245
Mountain	126	157	168	176	216
Pacific	470	593	545	551	711
Other[a]	80	109	94	96	138

Source: Aerospace Industries Association.
NOTE: Data for 1969 and 1971 are not available. Totals include proposed facilities.
a Includes Canada and Puerto Rico.

HOSPITAL HELIPORTS IN THE UNITED STATES AND CANADA

By Region
Selected Years 1969 to Date

Region	1969	1970	1972	1973	1974
TOTAL	161	285	354	384	489
New England	2	5	5	5	10
Middle Atlantic	22	29	43	42	51
East North Central	52	74	82	99	120
West North Central	4	18	22	21	26
South Atlantic	24	33	39	50	67
East South Central	1	5	18	18	24
West South Central	17	20	26	26	38
Mountain	11	24	29	32	41
Pacific	28	73	87	87	105
Canada	–	4	3	4	7

Source: Aerospace Industries Association.
NOTE: Data for 1971 are not available. Totals include proposed facilities.

HELICOPTER TRAFFIC
UNITED STATES SCHEDULED AIRLINES

Calendar Years 1960 to Date
(Thousands)

Year	Miles Flown	Passengers Carried	Passenger-Miles	Ton-Miles
1960	2,219	430	9,475	1,054
1961	2,157	490	8,604	963
1962	1,518	359	8,192	897
1963	1,462	458	12,510	1,317
1964	1,976	608	16,003	1,668
1965	1,984	718	18,811	1,948
1966	2,241	1,067	25,420	2,562
1967	2,660	1,220	29,670	2,960
1968	2,547	1,042	24,856	2,482
1969	1,909	737	17,074	1,703
1970	1,427	573	11,341	1,167
1971	1,048	551	8,973	917
1972	1,022	587	10,009	1,020
1973	1,085	613	10,936	1,108
1974	1,029	592	10,298	1,055

Source: Civil Aeronautics Board, Bureau of Accounts and Statistics.

REVENUE TON-MILE TRAFFIC CARRIED
SCHEDULED HELICOPTER AIRLINES

Calendar Years 1960 to Date
(In Thousands)

Year	TOTAL TON-MILES	Passenger	U.S. Mail	Express	Freight	Excess Baggage
1960	1,054	911	91	40	7	5
1961	963	818	94	40	7	5
1962	897	778	65	44	6	3
1963	1,317	1,189	74	44	6	5
1964	1,668	1,520	92	45	6	6
1965	1,948	1,787	84	60	10	6
1966	2,562	2,415	60	70	10	7
1967	2,960	2,819	61	64	9	8
1968	2,482	2,361	57	48	8	7
1969	1,704	1,626	34	37	6	4
1970	1,167	1,134	5	25	4	(a)
1971	917	897	4	13	3	(a)
1972	1,020	1,001	5	12	3	(a)
1973	1,108	1,094	3	8	3	(a)
1974	1,055	1,045	4	2	2	(a)

Source: Civil Aeronautics Board, Bureau of Accounts and Statistics.
a Effective January 1, 1970, the certificated route air carriers no longer report excess baggage separately. Excess baggage is now combined with passenger ton-miles and passenger weight standardized at 200 lbs.

Research and Development

Research, development, test and evaluation (RDT&E) outlays of DOD—traditionally the principal source of industry R&D contracts—remained at levels approximating those of the earlier years of the decade. In terms of dollars, DOD funding showed a slight increase over the previous year; inflation-adjusted, the funding bought slightly less effort. Outlays for all RDT&E functions of DOD amounted to $8.6 billion in 1974 compared with $8.2 billion in 1973. The increase was less in aerospace R&D wherein 1974 outlays totaled $4.6 billion, roughly the same in 1973.

The greatest expenditures for aerospace R&D—$2.1 billion of a total $4.6 billion defense aerospace RDT&E outlay—were in the missile category. DOD's major programs in this area were those concerned with advancing the strategic missile capability through development of new weapons and improvement of existing weapons.

In terms of dollar outlays, the largest DOD missile program was the Navy's Trident, a program aimed at development of a new SLBM to be used with a new nuclear submarine, also in development. Among other major projects, the Air Force continued to improve the effectiveness of the operational Minuteman II and III ICBMs. Principal developments include a higher-yield warhead, a more advanced arming and fusing mechanism and a new guidance system. DOD is also conducting the Advanced ICBM Technology Program whose aim is the development of a Minuteman successor for the eighties and beyond. Tentatively known as MX, the advanced ICBM was in 1974 only a concept; studies focused on the major question of whether the missile should be silo-based, like its predecessors, or whether the fixed silo would be too vulnerable to future technology.

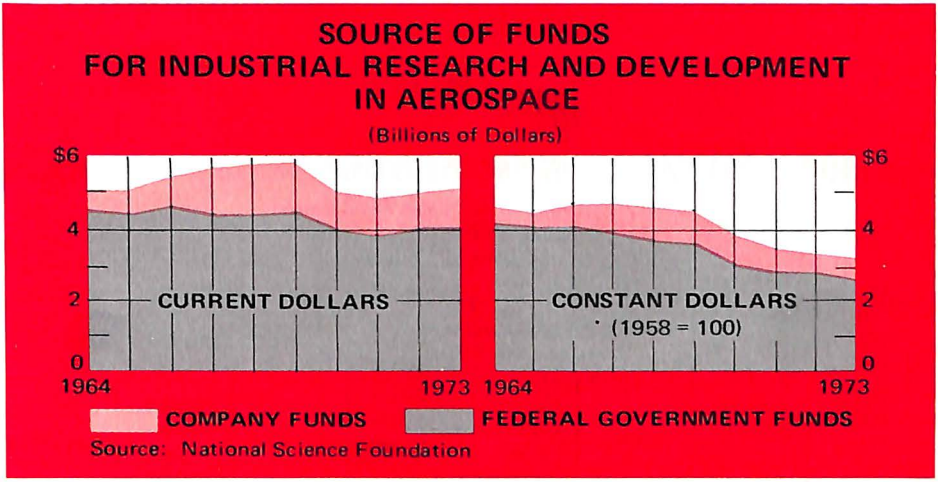
Another important DOD project is the Joint Air Force-Navy Cruise Missile Technology Program whose goal is the development of long-range strategic missiles which "cruise" within the atmosphere as complementary weapons to the ballistic missiles. The Air Force is working on an Air-Launched Cruise Missile and the Navy on the Sea-Launched Cruise Missile, both scheduled for first flights in 1976.

In the aircraft category—$1.9 billion of the RDT&E outlay—the largest funding in 1974 went for continuing development of the Air Force's B-1 strategic bomber. The prototype B-1 made its first flight late in 1974 and began a two-year test program which will provide input for the decision (scheduled for 1976) as to whether the airplane will be produced in quantity.

A project of particular interest in 1974 was development of the Air Combat Fighter and a competitive runoff between two versions, the F-16 and the YF-17. The Air Force selected the F-16 and it is expected that several foreign nations may also buy the airplane in preference to foreign competitive planes. The Navy engaged in its own Naval Air Combat Fighter evaluation, considered the same two aircraft, but finally chose the YF-18, a YF-17 derivative.

Other major DOD aircraft development projects included the A-10 close air support attack aircraft, which reached production status, the E-4A Advanced Airborne Command Post, and the Advanced Medium STOL Transport.

Industry participation in government-funded R&D programs also included civil and military space research (covered under Space Programs). Contractors in 1974 also worked for the Atomic Energy Commission in such aerospace-related areas as weapons and space nuclear systems research, and in non-aerospace areas such as biomedical/environmental research and reactor development.



INDUSTRIAL RESEARCH AND DEVELOPMENT ALL INDUSTRIES AND THE AEROSPACE INDUSTRY

Calendar Years 1960 to Date
(Millions of Dollars)

Year	All Industries	Aerospace[a] Industry		
	TOTAL	TOTAL	Federal Government Funds	Company Funds
1960	$ 10,509	$ 3,514	$ 3,150	$ 364
1961	10,908	3,829	3,438	392
1962	11,464	4,042	3,588	454
1963	12,630	4,712	4,261	452
1964	13,512	5,078	4,621	457
1965	14,185	5,148	4,499	649
1966	15,548	5,526	4,724	802
1967	16,385	5,669	4,531	1,138
1968	17,429	5,776	4,544	1,232
1969[r]	18,308	5,909	4,554	1,355
1970	18,062	5,245	4,032	1,213
1971[r]	18,311	4,912	3,900	1,012
1972[r]	19,383	4,992	4,043	948
1973	20,921	5,051	3,961	1,090

Source: National Science Foundation.
a Includes companies primarily engaged in the manufacture of aircraft and parts, SIC Code 372, and the manufacture of ordnance and accessories, including complete guided missiles and space vehicles, SIC Code 19.
r Revised.

INDUSTRIAL RESEARCH AND DEVELOPMENT IN AEROSPACE

By Type of Research and Fund Source
Calendar Years 1960 to Date
(Millions of Dollars)

Year	TOTAL AERO-SPACE	Applied Research and Development Funds			Basic Research Funds		
		TOTAL	Federal Govern-ment Contracts	Company	TOTAL	Federal Govern-ment Contracts	Company
1960	$ 3,514	$ 3,452	$ 3,118	$ 334	$ 62	$ 32	$ 30
1961	3,829	3,789	3,417	372	40	20	20
1962	4,042	3,987	3,558	429	55	30	25
1963	4,712	4,653	4,229	424	59	31	28
1964	5,078	5,010	4,585	424	68	35	33
1965	5,148	5,074	4,457	617	74	42	32
1966	5,526	5,452	4,685	767	74	39	35
1967	5,669	5,596	4,497	1,099	73	34	39
1968	5,776	5,705	4,518	1,187	71	26	45
1969	5,909	5,842	4,529	1,313	67	25	42
1970	5,245	5,182	4,012	1,170	63	20	43
1971[r]	4,912	4,858	3,880	978	54	20	34
1972[r]	4,992	4,931	4,022	908	61	21	40
1973	5,051	4,999	3,940	1,059	52	22	30

Source: National Science Foundation.
r Revised.

FEDERAL OUTLAYS FOR RESEARCH AND DEVELOPMENT

Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	TOTAL	DOD	NASA	AEC	Other
1960	$ 7,738	$ 5,654	$ 401	$ 986	$ 697
1961	9,278	6,618	744	1,111	805
1962	10,379	6,812	1,257	1,284	1,026
1963	12,000	6,849	2,552	1,335	1,264
1964	14,694	7,517	4,171	1,505	1,501
1965	14,875	6,728	5,093	1,520	1,534
1966	16,002	6,735	5,933	1,462	1,872
1967	16,842	7,680	5,426	1,467	2,269
1968	16,865	8,148	4,724	1,593	2,400
1969	16,207	7,858	4,251	1,654	2,444
1970	15,632	7,568	3,753	1,616	2,695
1971	15,050	7,541	3,382	1,303	2,824
1972	16,629	8,275	3,422	1,552	3,380
1973	17,407	8,574	3,315	1,623	3,895
Year	**TOTAL**	**DOD**	**NASA**	**ERDA**	**Other**
1974	18,239	8,956	3,256	1,825	4,202
1975[E]	19,437	9,096	3,207	2,323	4,811
1976[E]	21,653	10,235	3,498	2,809	5,111

Source: "The Budget of the United States Government" (Annually).
NOTE: Includes military personnel, procurement, civil functions and some other items not included in other tables. Includes R&D facilities and administrative operating costs. AEC research and development programs transferred to ERDA with 1974 reorganization.
a Fiscal years ending June 30.
E Estimate.

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

By Agency
Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	TOTAL	Air Force	Navy	Army	Other
1960	$ 4,710	$ 2,348	$ 1,129	$ 1,021	$ 212
1961	6,131	3,300	1,435	1,207	189
1962	6,319	3,493	1,364	1,280	180
1963	6,376	3,301	1,429	1,355	291
1964	7,021	3,722	1,578	1,338	383
1965	6,236	3,146	1,294	1,344	452
1966	6,259	2,948	1,407	1,412	492
1967	7,160	3,229	1,791	1,634	506
1968	7,747	3,800	2,003	1,434	510
1969	7,457	3,386	2,045	1,521	505
1970	7,166	2,937	2,084	1,665	480
1971	7,303	2,809	2,405	1,569	520
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[E]	8,650	3,343	2,899	1,877	531
1976[E]	9,610	3,740	3,249	2,035	586
Tr. Qtr.[E]	2,250	924	663	540	123

Source: Department of Defense, OASD (Comptroller), FAD 730/76, February 1975.
NOTE: For RDT&E for aircraft, missiles and astronautics, see page 25.
For an explanation of the Transition Quarter, see page 25.
a Fiscal Years ending June 30.
E Estimate.

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

By Function
Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	TOTAL, All RDT&E Functions	Aerospace				Other
		TOTAL	Aircraft	Missiles	Astro-nautics	
1960	$ 4,710	$ 3,203	$ 632	$ 2,059	$ 512	$ 1,507
1961	6,131	4,090	547	3,025	518	2,041
1962	6,319	4,150	624	2,777	749	2,169
1963	6,376	3,731	544	2,241	946	2,645
1964	7,021	4,575	939	2,352	1,284	2,446
1965	6,236	3,839	1,017	1,901	921	2,397
1966	6,259	3,707	976	1,801	930	2,552
1967	7,160	4,533	1,048	2,502	983	2,627
1968	7,747	5,077	1,335	2,522	1,220	2,670
1969	7,457	4,600	1,031	2,410	1,159	2,857
1970	7,166	4,188	1,239	2,196	753	2,978
1971	7,303	4,226	1,699	2,008	519	3,077
1972	7,881	4,691	2,066	2,157	468	3,190
1973	8,157	4,586	2,036	2,038	512	3,571
1974	8,582	4,614	1,893	2,160	561	3,968
1975[E]	8,650	N.A.	N.A.	N.A.	N.A.	N.A.
1976[E]	9,610	N.A.	N.A.	N.A.	N.A.	N.A.
Tr. Qtr.[E]	2,250	N.A.	N.A.	N.A.	N.A.	N.A.

Source: Department of Defense, Budget Press Briefing, OASD (Comptroller), February 3, 1975.
a Fiscal Years ending June 30.
E Estimate.
N.A. Not available.
Tr. Qtr.: See page 25 for explanation of the Transition Quarter.

FEDERAL AERONAUTICS RESEARCH AND DEVELOPMENT

New Obligational Authority
Fiscal Years[a] 1967 to 1976[E]
(Millions of Dollars)

Year	TOTAL	NASA	DOD	DOT
1967	$ 1,613	$ 105	$ 1,199	$ 309
1968	1,404	136	1,126	142
1969	1,300	169	1,161	– 30[b]
1970	1,882	199	1,641	42
1971	1,990	210	1,707	73
1972	2,295	236	1,964	95
1973	2,187	313	1,799	75
1974	2,030	278	1,678	74
1975[E]	1,994	309	1,615	70
1976[E]	2,535	314	2,123	98

Source: "Aeronautics and Space Report of the President," (Annually).
a Fiscal Years ending June 30.
b Unobligated balances for SST research and development, rescinded in 1969.
E Estimate.

MILITARY AIRCRAFT PROGRAM ACQUISITION COSTS[a]
RESEARCH, DEVELOPMENT, TEST AND EVALUATION

By Department, Type and Model
Fiscal Years[b] 1975, 1976 and the Transition Quarter
(Millions of Dollars)

Department, Type and Model	1975[E]	1976[E]	Transition Quarter[E]
AIR FORCE			
A-10 Close Air Support	$ 81.4	$ 51.9	$ 1.0
E-3A AWACS	210.0	199.2	54.5
F-5E Fighter Aircraft	3.1	3.4	—
F/TF-15A Eagle	182.6	39.9	—
E-4A AABNCP	62.8	42.2	7.8
Adv. Med. STOL Transport[c]	55.8	85.0	11.4
B-1 Bomber	445.0	672.2	168.3
ACF Air Combat Fighter[c]	32.0	273.0	82.5
NAVY			
A-4M Skyhawk	6.8	4.5	0.3
A-6E Intruder	10.4	4.1	—
A-7E Corsair II	7.6	6.8	0.5
F-14A Tomcat	12.0	—	—
S-3A Viking	1.0	—	—
CH-53E Sea Stallion	46.8	10.5	—
NACF Navy Air Combat Fighter[c]	20.1	110.2	22.6
V/STOL Aircraft Development[c]	14.3	22.0	5.5
ARMY			
AH-IS Cobra/TOW	5.5	2.0	0.5
CH-47C Chinook	3.0	46.4	2.8
HLH Heavy Lift Helicopter[c]	32.8	19.8	3.0
UTTAS[c]	52.7	91.9	18.7
AAH[c]	60.9	65.0	17.9

Source: "Program Acquisition Costs by Weapon System," Department of Defense Budget for Fiscal Year 1976.
NOTE: See page 25 for an explanation of the Transition Quarter.
a Total Obligational Authority.
b Fiscal Years ending June 30.
c Systems in R&D only.
E Estimate.

MISSILE PROGRAM ACQUISITION COSTS[a]
RESEARCH, DEVELOPMENT, TEST AND EVALUATION

By Agency, Type and Model
Fiscal Years[b] 1975, 1976 and the Transition Quarter
(Millions of Dollars)

Agency, Type and Model	1975[E]	1976[E]	Transition Quarter[E]
AIR FORCE			
Minuteman II & III	$ 123.9	$ 122.7	$ 34.0
SRAM	—	3.0	2.4
Harpoon (c)	0.4	10.3	7.3
Adv. ICBM (M-X) (c)	37.3	41.2	15.3
Close Air Support (c)	20.8	31.5	16.8
Air Launched Cruise Missile (c)	54.6	51.0	13.0
NAVY			
Trident I	640.2	732.5	171.5
Sparrow	6.0	6.9	4.0
Sidewinder	12.6	3.0	0.6
Condor	5.7	1.1	0.2
Standard ER	12.6	15.0	2.0
Harpoon	68.1	19.9	—
Standard MR	12.6	15.0	2.0
Standard Active SSM	19.5	8.2	1.3
AGILE	16.5	18.0	20.0
Standard Missile II (SM-2) (c)	25.2	30.0	4.0
Strategic Cruise Missile (c)	38.0	101.8	42.1
AEGIS (c)	63.0	66.0	9.6
ARMY			
Chapparal	3.1	14.8	5.7
Safeguard	34.3	—	—
Hawk	8.5	15.7	3.1
Dragon	2.0	5.0	0.6
TOW	8.5	11.4	3.0
Pershing	2.0	19.0	6.0
SHORAD (c)	17.1	65.0	13.0
Stinger (c)	32.4	20.7	1.7
Site Defense (c)	114.9	140.0	38.0
SAM-D (c)	104.8	130.0	40.0

Source: "Program Acquisition Costs by Weapon System," Department of Defense Budget for Fiscal Year 1976.
NOTE: For an explanation of the Transition Quarter, see page 25.
a Total Obligational Authority.
b Fiscal Years ending June 30.
c Weapon Systems in R & D only.
E Estimate.

Foreign Trade

The U.S. incurred an overall trade deficit in 1974, the third in the last four years and the second largest in history at $3 billion. The slide into a negative balance, however, would have been worse had it not been for strong gains in certain sectors, foremost of which was the greatest-ever aerospace trade surplus.

Aerospace exports reached $7.1 billion, almost $2 billion higher than in 1973, which was itself a record year. The aerospace trade surplus amounted to $6.4 billion, also up $2 billion from the previous year. The impact of these exceptional gains is not to be underestimated, as the world experienced much economic disorder. In most industrial nations, economic growth came to a virtual standstill and inflation was uncontrollable. All price indexes spiraled upward but certain items, especially food and energy, were up in totally dispro-

portionate relationship to the median. Thus, nations needing high-volume imports of the superinflated commodities, and that included most of the free world, found themselves in severe trade imbalance.

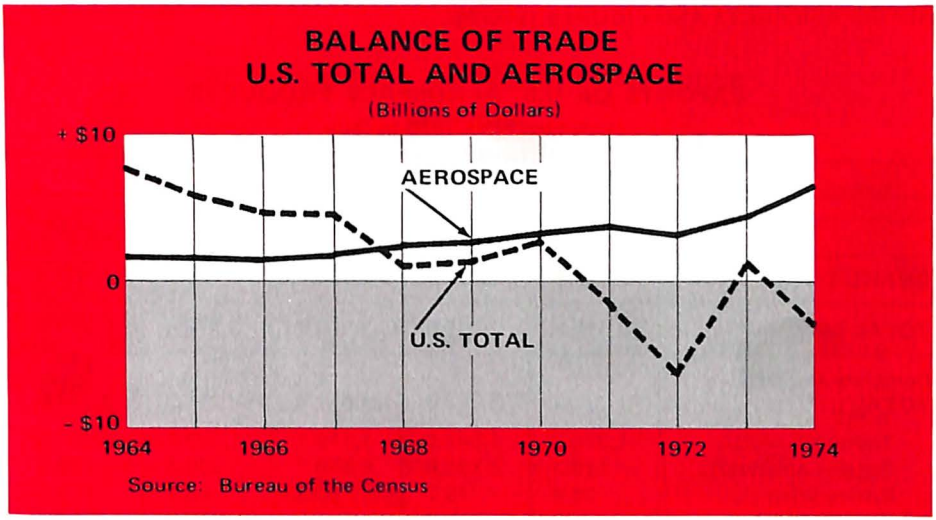
By far the most significant contributor to the disorder was the four-fold increase in the price of crude oil. The seven major free world industrial nations (the U.S., United Kingdom, West Germany, Italy, Japan, France and Canada) had a combined trade surplus in all products other than oil of $76 billion. With oil included, they recorded a joint deficit of $1.6 billion.

The effect on the U.S. is evident in this startling fact: the U.S. trade deficit in fuels amounted to almost $22 billion, compared with a $6.5 billion deficit in 1973, previously the greatest deficit year in fuel trade. Also, the nation experienced the customary deficit in metals and minerals. These two categories alone, fuel and metals/minerals, accounted for a combined deficit of over $25 billion.

Major surpluses in two trade categories partially offset this staggering deficit, accounting jointly for almost $19 billion on the plus side of the ledger. Agricultural products, the largest contributor, scored new records in total exports ($22 billion) and trade balance ($11.6 billion). The other big trade balance ($7.3 billion) came from manufactured products of which aerospace accounted for all except $900 million.

By far the major portion of the $6.4 billion aerospace surplus came from sales abroad of civil aircraft, parts and accessories, accounting for 74 percent. Most of this increase was in deliveries of commercial jet transports—228 planes worth $2.7 billion. For the second time since the introduction of the wide-body family—the other occasion was in 1971—dollar value of deliveries to foreign customers surpassed those to U.S. airplanes.

Exports of military aerospace products approached $2 billion in 1974; aircraft and parts represented 91 percent of the value. Rockets, missiles and their accessories accounted for the remainder. Aircraft alone accounted for $1.1 billion. Exports, of course, include aerospace foreign military sales made under the auspices of DOD and subject to national defense and foreign policy considerations.



TOTAL AND AEROSPACE BALANCE OF TRADE

Calendar Years 1960 to Date
(Millions of Dollars)

Year	TOTAL U.S. Trade Balance[a]	Aerospace			Aerospace Trade Balance as Percent of U.S. Total
		Trade Balance	Exports	Imports	
1960	$ 5,369	$ 1,665	$ 1,726	$ 61	31.0%
1961	6,096	1,501	1,653	152	24.6
1962	5,178	1,795	1,923	128	34.7
1963	6,060	1,532	1,627	95	25.3
1964	7,556	1,518	1,608	90	20.1
1965	5,852	1,459	1,618	159	24.9
1966	4,524	1,370	1,673	303	30.3
1967	4,409	1,961	2,248	287	44.4
1968	1,133	2,661	2,994	333	234.9
1969	1,289	2,831	3,138	307	219.6
1970[r]	2,834	3,097	3,405	308	109.3
1971[r]	-2,024[b]	3,830	4,203	373	(c)
1972[r]	-6,351	3,230	3,795	565	(c)
1973[r]	1,222	4,360	5,142	782	356.8
1974	-2,984	6,356	7,101	745	(c)

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity and Country," Report FT 410; "U.S. Imports, General and Consumption, Schedule A, Commodity and Country," Report FT 135; "Highlights of U.S. Export and Import Trade," FT 990 (All are monthly publications).

a U.S. Balance of Trade is the difference between exports of domestic merchandise, including Department of Defense shipments, and imports for consumption.

b First negative U.S. Balance of Trade since 1888.

c Not applicable.

r Revised.

EXPORTS OF U.S. AEROSPACE PRODUCTS

Calendar Years 1970 to Date
(Millions of Dollars)

	1970[r]	1971[r]	1972[r]	1973[r]	1974
GRAND TOTAL	$ 3,405.5	$ 4,202.9	$ 3,794.5	$ 5,141.9	$ 7,100.8
TOTAL CIVILIAN	2,516.3	3,079.9	2,953.7	3,788.4	5,279.0
Complete Aircraft, TOTAL	1,528.2	1,913.8	1,614.5	2,314.9	3,371.9
Transports	1,276.3	1,542.0	1,119.1	1,663.7	2,660.6
General Aviation[a]	119.3	113.9	140.3	206.4	296.8
Rotary Wing	26.9	45.7	50.3	83.3	109.6
Other, Including Used	105.7	212.2	304.8	361.5	304.9
Engines, TOTAL	117.6	148.5	184.3	175.7	228.9
Jet & Gas Turbine	98.4	128.6	158.6	144.8	195.1
Internal Combustion	19.2	19.9	25.7	30.9	33.8
Parts, Accessories & Equipment for Aircraft and Engines, Including Spares, TOTAL	870.5	1,017.6	1,154.9	1,297.8	1,678.2
Engine Spares & Accessories	201.1	226.8	268.2	367.9	472.9
Other Spares & Equipment	669.4	790.8	886.7	929.9	1,205.3
TOTAL MILITARY	889.2	1,123.0	840.8	1,353.5	1,821.8
Complete Aircraft, TOTAL	467.0	633.3	383.4	790.8	1,101.2
Transports	81.9	80.7	124.6	131.2	190.3
General Aviation	4.5	0.5	1.4	1.0	0.8
Rotary Wing	22.7	43.8	53.1	37.6	50.1
Fighters & Bombers	330.8	477.7	186.5	588.4	845.2
Trainers	12.9	12.0	14.4	12.1	6.0
Other, Including Used	14.2	18.6	3.4	20.5	8.8
Engines, TOTAL	45.1	48.2	56.5	45.8	49.5
Jet & Gas Turbine	28.1	29.7	44.6	35.7	36.0
Missile Turbine	10.0	12.6	5.1	2.9	2.1
Internal Combustion	7.0	5.9	6.8	7.2	11.4

(Continued on next page)

EXPORTS OF U.S. AEROSPACE PRODUCTS

(Continued)

	1970[r]	1971[r]	1972[r]	1973[r]	1974
MILITARY, Continued					
Parts, Accessories & Equipment, Including Spares, TOTAL	268.4	321.6	299.8	415.1	514.9
Engine Spares & Accessories	63.9	58.3	78.5	97.4	121.5
Other Spares & Equipment	204.5	263.3	221.3	317.7	393.4
Rockets, Guided Missiles & Parts, TOTAL	108.7	119.9	101.1	101.8	156.2
Complete Rockets & Guided Missiles . .	8.1	26.1	18.0	31.8	37.4
Parts & Accessories for Rockets & Guided Missiles	100.6	93.8	83.1	70.0	118.8

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity and Country," Report FT 410 (Monthly).
a Includes transports under 33,000 pounds.
r Revised

U. S. AEROSPACE IMPORTS

Calendar Years 1960 to Date
(Thousands of Dollars)

Year	TOTAL	Aircraft[a]	Aircraft Engines	Aircraft Parts[b]
1960	$ 60,901	$ 6,841	$ 7,388	$ 46,672
1961	151,667	82,821	17,485	51,361
1962	128,204	54,280	9,707	64,217
1963	95,290	26,831	4,675	63,784
1964	90,062	21,505	6,573	61,984
1965	158,837	73,406	20,149	65,282
1966	303,264	162,645	32,774	107,845
1967	286,968	61,136	30,750	195,082
1968	333,469	110,817	37,913	184,739
1969	306,625	104,375	30,540	171,710
1970	308,334	48,297	33,686	226,351
1971	372,698	78,613	35,996	258,089
1972	564,989	101,170	155,127	308,692
1973[r]	781,664	203,038	221,452	357,174
1974	744,538	124,006	235,743	384,789

Source: Bureau of the Census, "U. S. Imports, General and Consumption, Schedule A, Commodity and Country," Reports FT 110, 125, 135 (Monthly).

a Aircraft includes new and used airplanes, seaplanes and amphibians.

b Aircraft parts not elsewhere specified.

r Revised.

U. S. EXPORTS OF MILITARY AIRCRAFT

Calendar Years 1970 to Date

	1970	1971	1972	1973	1974
NUMBER OF AIRCRAFT					
TOTAL	639	788	561	608	736
Bombers, Land & Carrier Type	217	19	4	68	90
Fighters, Land & Carrier Type		259	106	208	309
Trainers	83	55	127	62	40
Utility, Personal & Liaison Aircraft	110	12	42	19	15
Cargo Transports	80	34	48	45	47
Passenger Transports	—	15	27	—	—
Rotary Wing Aircraft	68	126	138	79	73
New Aircraft, NEC	76	162	45	97	140
Used or Rebuilt Aircraft	3	6	21	24	19
Airships & Balloons	N.A.	100	3	6	3
VALUE—Millions of dollars					
TOTAL	$467.0	$633.3	$383.4	$790.8	$1,101.2
Bombers, Land & Carrier Type	330.8	15.1	3.1	69.6	105.4
Fighters, Land & Carrier Type		462.6	183.4	518.8	739.8
Trainers	12.9	12.0	14.4	12.1	6.0
Utility, Personal & Liaison Aircraft	4.5	0.5	1.4	1.0	0.8
Cargo Transports	81.9	76.5	122.9	131.2	190.3
Passenger Transports	—	4.2	1.7	—	—
Rotary Wing Aircraft	22.7	43.8	53.1	37.6	50.1
New Aircraft, NEC	12.1	18.5	0.9	19.4	6.9
Used or Rebuilt Aircraft	2.1	0.1	2.4	1.0	1.8
Airships & Balloons	(a)	(a)	0.1	0.1	0.1

Source: Bureau of the Census, "U. S. Exports, Schedule B, Commodity and Country," Report FT 410 (Monthly).
a Less than $0.05 million.
N.A. Not available.
NEC Not elsewhere classified.

EXPORT-IMPORT BANK
GROSS AUTHORIZATIONS OF CREDITS AND GUARANTEES IN SUPPORT OF COMMERCIAL AIRCRAFT EXPORTS

Fiscal Years[a] 1960 to Date
(Millions of Dollars)

Year	Credits and Guarantees			Credits[b]			Guarantees[c]		
	TOTAL	Jets	Other	TOTAL	Jets	Other	TOTAL	Jets	Other
1960	$ 93.8	$ 93.1	$ 0.7	$ 93.8	$ 93.1	$ 0.7	$ —	$ —	$ —
1961	94.3	93.8	0.5	94.3	93.8	0.5	—	—	—
1962	51.4	50.6	0.8	4.2	3.7	0.5	47.2	46.9	0.3
1963	20.3	15.7	4.6	3.0	—	3.0	17.3	15.7	1.6
1964	80.0	79.2	0.8	32.6	32.6	—	47.4	46.6	0.8
1965	93.6	86.9	6.7	1.4	1.4	—	92.2	85.5	6.7
1966	132.1	122.3	9.8	99.3	94.4	4.9	32.8	27.9	4.9
1967	811.2	791.3	19.9	806.3	789.1	17.2	4.9	2.2	2.7
1968	400.4	386.8	13.6	336.8	336.8	—	63.6	50.0	13.6
1969	318.1	308.7	9.4	204.7	197.5	7.2	113.4	111.2	2.2
1970	736.4	677.4	59.0	636.2	598.2	38.0	100.2	79.2	21.0
1971	887.7	847.8	39.9	490.4	484.2	6.2	397.3	363.6	33.7
1972	682.3	651.3	31.0	479.6	475.4	4.2	202.7	175.9	26.8
1973	965.7	879.3	86.4	722.4	689.7	32.7	243.3	189.6	53.7
1974	1,103.9	1,027.6	76.3	946.2	894.6	51.6	157.7	133.0	24.7

Source: Export-Import Bank of the United States.
a Fiscal Years ending June 30.
b "Credit" is a commitment of direct financing by the Export-Import Bank.
c "Guarantee" by the Export-Import Bank of principal and interest on a loan made by another institution such as a commercial bank.

U.S. EXPORTS OF CIVIL TRANSPORT AIRCRAFT

Calendar Years 1960 to Date
(Millions of Dollars)

Year	TOTAL		Under 33,000 Pounds Airframe Weight		33,000 Pounds and Over Airframe Weight	
	Number	Value	Number	Value	Number	Value
1960	159	$ 480.1	67	$ 15.8	92	$ 464.3
1961	119	262.5	68	11.2	51	251.3
1962	172	259.2	122	13.8	50	245.4
1963	181	190.9	151	18.1	30	172.8
1964	225	211.1	193	29.1	32	182.0
1965	76	351.8	16	4.9	60	346.9
1966	82	420.8	6	0.1	76	420.7
1967	134	611.4	13	4.4	121	607.0
1968	240	1,200.2	19	9.9	221	1,190.1
1969	182	946.9	17	25.5	165	921.4
1970	184	1,283.1	19	6.8	165	1,276.3
1971	173	1,566.5	25	24.5	148	1,542.0
1972	148	1,129.1	43	10.0	105	1,119.1
1973[r]	149	1,669.5	21	5.8	128	1,663.7
1974	242	2,670.2	14	9.6	228	2,660.6

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity and Country," Report FT 410 (Monthly).
r Revised.

U. S. EXPORTS OF CIVIL HELICOPTERS

Calendar Years 1966 to Date
(Millions of Dollars)

Year	TOTAL		Under 2,000 Pounds		2,000 Pounds and Over	
	Number	Value	Number	Value	Number	Value
1966	161	$ 11.5	119	$ 5.1	42	$ 6.4
1967	223	25.2	166	9.9	57	15.3
1968	242	32.9	169	11.9	73	21.0
1969	252	29.1	212	12.7	40	16.4
1970	332	26.9	284	17.1	48	9.8
1971	298	45.7	230	17.9	68	27.8
1972	256	50.3	184	17.1	72	33.2
1973	428	83.3	317	33.1	111	50.2
1974	395	109.6	267	29.7	128	79.9

Source: Bureau of the Census, "U. S. Exports, Schedule B, Commodity and Country," Report FT 410 (Monthly).

U.S. EXPORTS OF GENERAL AVIATION AIRCRAFT

Calendar Years 1965 to Date

Year	TOTAL		Single Engine		Multi-Engine			
					Under 3000 lbs.		3000 Lbs. & Over	
	Number	Value (Millions)	Number	Value (Millions)	Number	Value (Millions)	Number	Value (Millions)
1965	2,457	$ 68.8	2,031	$ 30.6	184	$ 8.4	242	$ 29.8
1966	2,985	89.1	2,387	35.2	261	13.4	337	40.5
1967	3,125	91.2	2,554	36.9	198	9.5	373	44.8
1968	2,890	101.3	2,295	36.1	163	8.5	432	56.7
1969	2,461	125.6	1,761	35.0	211	11.9	489	78.7
1970	2,037	112.5	1,493	31.5	142	8.7	402	72.3
1971	1,566	89.4	1,199	26.1	80	5.1	287	58.2
1972	2,072	130.3	1,546	34.6	92	5.0	434	90.7
1973	3,163	200.6	2,392	53.2	149	8.4	622	139.0
1974	4,263	287.2	3,367	81.4	116	6.4	780	199.4

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity and Country," Report FT 410 (Monthly).

U.S. EXPORTS OF USED AIRCRAFT

Calendar Years 1960 to Date
(Millions of Dollars)

Year	TOTAL		Military		Non-Military	
	Number	Value	Number	Value	Number	Value
1960	634	$ 26.2	70	$ 0.5	564	$ 25.7
1961	618	35.1	124	1.2	494	33.9
1962	511	37.5	129	0.9	382	36.6
1963	423	16.6	67	0.2	356	16.4
1964	489	30.7	201	2.8	288	27.9
1965	474	39.7	67	0.7	407	39.0
1966	397	45.7	33	15.0	364	30.7
1967	391	85.5	29	25.3	362	60.2
1968	304	75.5	14	6.8	290	68.7
1969	382	137.7	3	(a)	379	137.7
1970	361	106.1	3	2.1	358	104.0
1971	419	205.3	6	0.1	413	205.2
1972	471	301.4	21	2.4	450	299.0
1973[r]	621	358.5	24	1.0	597	357.5
1974	709	301.1	19	1.8	690	299.3

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity and Country," Report FT 410 (Monthly).

a Less than $0.05 million.

r Revised.

U.S. EXPORTS
MILITARY AND CIVIL AIRCRAFT ENGINES[a] AND PARTS

Calendar Years 1960 to Date
(Millions of Dollars)

Year	TOTAL	Internal Combustion			Jet and Gas Turbine			Missile Engines and Parts
		TOTAL	Engines	Parts	TOTAL	Engines	Parts	
1960	$ 235.1	$ 184.1	$ 32.5	$ 151.6	$ 51.0	$ 51.0	$ N.A.	$ N.A.
1961	279.8	214.0	27.4	186.6	65.8	65.8	N.A.	N.A.
1962	309.6	250.5	23.1	227.4	59.1	59.1	N.A.	N.A.
1963	293.3	240.8	27.2	213.6	52.5	52.5	N.A.	N.A.
1964	251.3	201.4	26.8	174.6	49.9	49.9	N.A.	N.A.
1965	276.4	156.8	40.6	116.2	113.8	60.9	52.9	5.8
1966	292.3	150.8	35.0	115.8	136.7	69.1	67.6	4.8
1967	335.2	158.9	36.8	122.1	173.1	88.4	84.7	3.2
1968	379.7	149.0	27.3	121.7	227.4	116.5	110.9	3.3
1969	387.8	129.6	24.3	105.3	250.0	120.1	129.9	8.2
1970	427.7	126.4	26.2	100.2	290.8	126.5	164.3	10.5
1971	481.8	110.0	25.8	84.2	357.8	158.3	199.5	14.0
1972	587.5	126.5	32.4	94.1	451.5	203.2	248.3	9.5
1973[r]	686.8	155.6	38.1	117.5	520.3	180.5	339.8	10.9
1974	872.8	187.9	45.2	142.7	664.8	231.1	433.7	20.1

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity and Country," Report FT 410 (Monthly).
NOTE: The "TOTAL" for 1960-1964 excludes "Parts" for Jet and Gas Turbine Aircraft Engines and "Missile Engines and Parts."
N.A. Not available.
a Includes new and used.
r Revised.

U.S. EXPORTS
NEW AND USED CIVIL AIRCRAFT ENGINES

Calendar Years 1960 to Date
(Millions of Dollars)

Year	TOTAL		Jet and Gas Turbine		Internal Combustion	
	Number	Value	Number	Value	Number	Value
1960	3,725	$ 70.7	480	$ 47.5	3,245	$ 23.2
1961	3,640	75.3	364	53.6	3,276	21.7
1962	3,690	63.0	341	44.8	3,349	18.2
1963	3,143	45.1	253	25.7	2,890	19.4
1964	4,062	46.7	247	25.0	3,815	21.7
1965	3,330	56.2	372	38.8	2,958	17.4
1966	4,006	77.0	564	49.3	3,442	27.7
1967	4,236	101.2	756	69.6	3,480	31.6
1968	3,279	115.6	866	92.4	2,413	23.2
1969	4,178	102.4	759	82.0	3,419	20.4
1970	3,790	117.6	634	98.4	3,156	19.2
1971	3,530	148.5	707	128.6	2,823	19.9
1972	3,823	184.3	592	158.6	3,231	25.7
1973	5,017	175.7	641	144.8	4,376	30.9
1974	4,923	228.8	801	195.0	4,122	33.8

Source: Bureau of the Census, "U.S. Exports, Schedule B, Commodity and Country," Report FT 410 (Monthly).

EXPORTS OF HELICOPTERS

By Selected U. S. Manufacturers
Calendar Years 1970 to 1974

	1970	1971	1972	1973	1974
NUMBER EXPORTED					
TOTAL	276	244	259	413	420
Canada & Greenland	56	75	75	68	67
Latin America	63	33	63	82	103
Europe	58	49	58	126	121
Asia	61	57	34	88	89
Oceania	28	11	12	27	31
Africa	10	14	7	22	9
Other Countries	—	5	10	—	—
VALUE (Millions of Dollars)[a]					
TOTAL	$ 32.8	$ 62.9	$ 73.7	$ 84.8	$ 123.7
Canada & Greenland	4.6	9.8	11.2	11.2	13.1
Latin America	7.7	5.0	14.2	23.8	24.5
Europe	11.5	18.3	23.8	32.0	63.4
Asia	5.9	12.1	8.5	12.8	19.1
Oceania	2.2	1.8	0.6	1.7	2.5
Africa	0.9	6.2	0.7	3.3	1.1
Other Countries	—	9.7	14.7	—	—

Source: Aerospace Industries Association.
NOTE: Data based on exports reported by Bell, Boeing-Vertol, Enstrom, Hiller, Hughes and Sikorsky.
a Manufacturers' Net Billing Price.

EXPORTS OF GENERAL AVIATION AIRCRAFT

By Selected U. S. Manufacturers
Calendar Years 1970 to 1974

	1970	1971	1972	1973	1974
NUMBER EXPORTED					
TOTAL	2,169	1,845	2,233	3,531[r]	4,248
Canada & Greenland	187	238	283	429[r]	514
Latin America	678	545	616	1,125	1,583
Europe	822	709	892	1,268	1,177
Asia	116	66	88	121	153
Oceania	156	82	132	219	450
Africa	210	205	222	269	371
VALUE (Millions of Dollars)[a]					
TOTAL	$ 99.3	$ 78.5	$ 129.9	$ 230.3[r]	$ 286.4
Canada & Greenland	7.5	N.A.	11.3	19.7[r]	23.2
Latin America	30.7	N.A.	42.9	69.1	99.1
Europe	37.4	N.A.	47.6	89.1	92.9
Asia	7.1	N.A.	9.2	10.0	21.6
Oceania	5.9	N.A.	5.3	17.1	21.0
Africa	10.7	N.A.	13.6	25.3	28.6

Source: General Aviation Manufacturers' Association.
NOTE: Data are based on exports reported by Beech, Bellanca, Cessna, Gates Learjet, Grumman American Aviation, Lake, Maule, Mooney, Piper, Rockwell and Swearingen of new civil aircraft under 20,000 pounds empty airframe weight.

a Manufacturers' Net Billing Price.
r Revised.

Employment

In 1974, the U.S. experienced one of the highest unemployment rates since the Great Depression of the thirties. The nation started the year with slightly more than 5 percent of the work force unemployed and the figure remained at approximately that level through the summer.

In the fall, however, came the real slump as demand and output declined. There were widespread layoffs, including many workers of long experience. By year-end, the national unemployment rate rose to 8.2 percent, a 34-year high.

Manufacturing industries were particularly hard-hit. Manufacturing employment had exhibited vigorous growth in the previous year, but it slowed in 1974. The decline in employment growth rates in manufacturing started earlier than other sectors of the economy and by fall unemployment rates among workers began a more rapid rise, particularly in the automotive, heavy machinery, textile

and apparel industries. By the end of the year the unemployment rate in all manufacturing industries was about double the rate of one year earlier. In addition to job losses, the factory workweek declined significantly as overtime work was curtailed and many firms were forced to put workers on part-time schedules.

Against this background, the employment picture in the aerospace industry was brighter. Where other manufacturing industries were declining, the aerospace industry actually registered a minor employment gain for the second consecutive year. The annual average employment figure of 965,000 represented only 64 percent of the peak year of the sixties when aircraft output was at a post-Korea high and the civil space program was at its greatest level of activity.

The increase of 17,000 employees over 1973 was not indicative of a new rising trend but rather of temporary fluctuations in the major areas of industry workload wherein increased effort in certain areas more than offset declines in others.

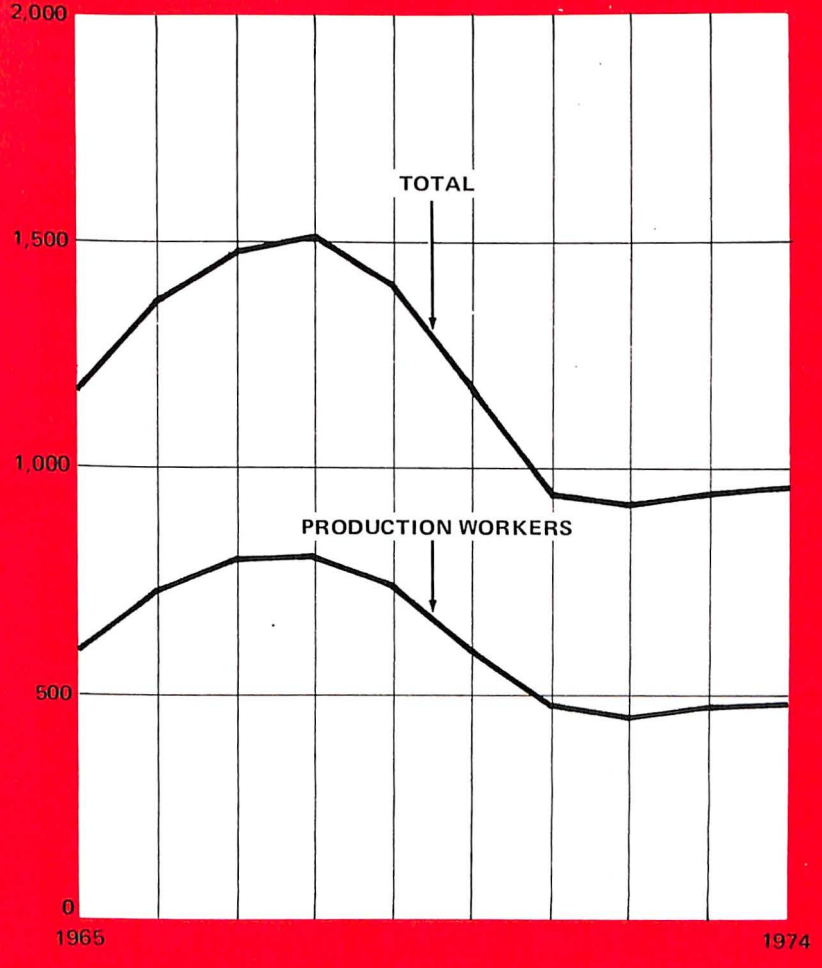
The number of production workers as a percent of the total industry labor force remained relatively constant at just under 50 percent. The production force increased slightly, from 475,000 in 1973 to 478,000 at the end of 1974. Here again the gain was due entirely to increased activity in aircraft production which employed 10,000 more workers than in the previous year. All other categories of production personnel registered a combined net loss of 7,000 employees.

In R&D, scientists and engineers dropped 2,000 below the previous year's level to 70,300, representing the lowest figure for that category since 1959, and reflecting the continuing decline in real R&D effort despite rising outlays for defense R&D, the principal source of industry contracts. The number of scientists and engineers engaged in aerospace R&D amounted to 19.5 percent of the national total of R&D-assigned scientists and engineers. It was the first time since the start of the space program that the figure had dropped below 20 percent, compared with nearly 30 percent in 1964, when both military and NASA R&D reached the highest activity level of the sixties.

The fact that the overall gain in industry employment may be temporary was indicated by an industry employment survey which forecast a decline for 1975. The survey estimated a drop to 946,000 by the end of 1975, practically all of it in the production workers category and almost entirely in aircraft production, reflecting stretchouts in delivery schedules of transport aircraft.

AEROSPACE INDUSTRY EMPLOYMENT

(Thousands of Employees)



Source: Aerospace Industries Association

AEROSPACE EMPLOYMENT

Calendar Years 1961 to Date
(Thousands of Employees)

Year	TOTAL	Aircraft	Missiles & Space	Communi-cations Equipment	Other
TOTAL EMPLOYMENT					
1961	1,178	610	152	160	256
1962	1,270	638	165	193	274
1963	1,267	639	173	183	272
1964	1,209	605	166	171	267
1965	1,175	624	155	145	251
1966	1,375	753	159	166	297
1967	1,484	834	157	179	314
1968	1,502	852	150	184	316
1969	1,402	804	124	179	295
1970	1,166	669	98	152	247
1971	951	531	88	129	203
1972	922	501	90	132	199
1973	948	514	95	134	205
1974	965	532	91	132	210
PRODUCTION WORKERS					
1961	612	348	56	75	133
1962	635	349	58	90	138
1963	625	351	55	82	137
1964	600	339	54	74	133
1965	597	356	51	62	128
1966	731	446	55	73	157
1967	804	502	55	78	169
1968	807	506	52	80	169
1969	746	464	41	86	155
1970	604	369	31	77	127
1971	480	285	26	66	103
1972	453	271	27	57	98
1973	475	281	31	59	104
1974	478	291	24	58	105

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

NOTE: Aerospace employment as shown is the sum of the estimated monthly average employment in the aircraft and missile and space industries (SIC 372 and 1925) plus estimated aerospace employment in the communications industry (SIC 3662) and estimated aerospace employment in the instruments and certain other industries (SIC 3811, 3821, 28, 35, 73, 89, etc.). Currently published data for the aircraft industry (SIC 372) include substantial missile and spacecraft employment. Thus, aircraft employment is actually lower, missile and space employment higher, than shown.

LABOR TURNOVER RATES IN THE AEROSPACE INDUSTRY

Calendar Years 1961 to Date
(Rates per 100 Employees per Year)

Year	Complete Missiles and Spacecraft	Aircraft			
		TOTAL	Airframes	Engines and Engine Parts	Other Parts & Equipment
ACCESSIONS					
1961	37.0	32.6	31.3	28.9	43.2
1962	37.2	35.2	32.9	30.5	49.3
1963	29.9	28.9	28.6	24.3	39.5
1964	23.5	24.7	23.0	20.2	38.6
1965	32.6	38.7	38.5	32.2	51.9
1966	44.1	48.6	47.3	43.2	61.0
1967	43.5	37.4	36.6	32.5	46.6
1968	40.7	28.1	27.1	22.9	39.8
1969	27.4	23.4	20.8	24.6	31.5
1970	19.3	16.1	13.9	15.1	26.2
1971	21.6	20.4	21.6	13.2	27.6
1972	31.2	24.0	22.8	21.6	33.6
1973	24.0	27.6	24.0	22.8	43.2
1974	24.0	25.2	24.0	19.2	38.4
SEPARATIONS					
1961	27.2	30.9	29.3	24.8	44.9
1962	31.6	31.3	29.0	23.9	47.9
1963	31.5	29.4	27.9	25.0	42.9
1964	39.1	31.0	28.9	28.0	42.9
1965	28.7	26.9	22.8	28.4	20.5
1966	30.8	31.5	28.1	31.0	46.9
1967	34.0	32.2	27.9	34.1	43.9
1968	45.4	32.3	30.2	31.3	41.1
1969	46.6	33.2	30.8	32.2	42.4
1970	48.7	41.7	43.8	32.1	47.4
1971	37.2	36.0	32.4	34.8	50.4
1972	26.4	25.2	22.8	19.2	38.4
1973	32.4	25.2	24.0	20.4	37.2
1974	30.0	22.8	20.4	20.4	33.6

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

EMPLOYMENT IN THE AIRCRAFT AND PARTS INDUSTRY

Calendar Years 1961 to Date
(Thousands of Employees)

Monthly Average for the Year	TOTAL	Aircraft (Airframes)	Aircraft Engines and Parts	Other Aircraft Parts and Equipment
TOTAL EMPLOYMENT				
1961	609.7	317.1	186.6	106.0
1962	638.4	334.7	198.9	104.9
1963	639.2	335.9	200.7	102.6
1964	605.4	319.2	189.1	97.1
1965	624.2	333.3	187.9	103.1
1966	753.3	417.3	208.1	127.8
1967	833.6	468.2	221.0	144.4
1968	852.0	487.8	216.4	147.8
1969	804.4	456.7	205.0	142.7
1970	668.7	369.6	179.9	119.2
1971	530.8	287.7	150.6	92.6
1972	501.1	272.2	138.5	90.5
1973	514.0	274.6	144.8	94.5
1974	532.0	289.3	146.2	96.5
PRODUCTION WORKERS				
1961	347.7	175.9	103.9	67.9
1962	349.1	175.1	108.5	65.6
1963	350.8	176.9	107.2	66.7
1964	338.6	175.7	99.2	63.7
1965	356.3	184.7	102.7	69.0
1966	446.4	239.8	119.4	87.2
1967	501.5	272.9	129.4	99.2
1968	505.5	280.9	123.9	100.7
1969	464.0	255.1	114.1	94.8
1970	369.3	197.0	95.0	77.3
1971	284.5	147.1	79.0	58.4
1972	271.2	139.5	73.5	58.2
1973	280.8	140.6	79.1	61.1
1974	290.5	147.4	80.3	62.8

Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly).
NOTE: The above figures include substantial missile and spacecraft employment in recent years. They do not, however, represent total aerospace employment, estimates for which appear in preceding tables in this chapter.

EARNINGS IN AIRCRAFT AND PARTS PLANTS[a]

Production Workers Only
(Includes Overtime Premiums)
Calendar Years 1961 to Date

Year	TOTAL	Aircraft (Airframes)	Aircraft Engines and Parts	Other Aircraft Parts and Equipment
AVERAGE HOURLY EARNINGS				
1961	$ 2.77	$ 2.78	$ 2.81	$ 2.70
1962	2.87	2.87	2.91	2.80
1963	2.95	2.95	2.99	2.89
1964	3.02	3.00	3.09	2.98
1965	3.14	2.15	3.17	3.08
1966	3.31	3.34	3.32	3.21
1967	3.45	3.49	3.42	3.35
1968	3.62	3.64	3.65	3.53
1969	3.86	3.90	3.87	3.76
1970	4.11	4.17	4.10	3.99
1971[r]	4.35	4.41	4.38	4.16
1972[r]	4.70	4.78	4.76	4.43
1973[r]	5.01	5.13	5.06	4.66
1974	5.40	5.57	5.43	5.01
AVERAGE WEEKLY EARNINGS				
1961	$ 114.68	$ 114.26	$ 116.62	$ 113.40
1962	119.97	119.97	120.77	118.72
1963	122.43	121.84	123.49	122.54
1964	125.03	123.30	127.31	126.35
1965	131.88	131.36	133.46	132.13
1966	143.32	142.95	144.09	142.85
1967	146.97	147.28	145.35	146.73
1968	152.04	152.88	151.11	151.44
1969	161.35	163.41	158.28	159.05
1970	168.51	170.97	166.05	166.78
1971	175.82	178.76	173.53	170.98
1972	193.44	197.66	193.17	183.10
1973	207.50	210.84	211.09	196.19
1974	218.70	219.46	223.72	210.92

Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly).
NOTE: The production workers surveyed include substantial missile and spacecraft employment. See NOTE page 118.
a Includes Overtime Premiums.
r Revised.

WORK-INJURY RATES[a]
AEROSPACE AND ALL MANUFACTURING

Calendar Years 1961 to Date

Year	All Manufacturing	Aircraft and Parts	Guided Missiles and Spacecraft[b]
1961	11.8	3.5	N.A.
1962	11.9	3.3	N.A.
1963	11.9	3.3	N.A.
1964	12.3	3.4	N.A.
1965	12.8	3.3	N.A.
1966	13.6	4.7	N.A.
1967	14.0	4.3	N.A.
1968	14.0	3.9	N.A.
1969	14.8	4.3	N.A.
1970	15.2	4.5	N.A.
1971	16.6	N.A.	N.A.
1972	15.6	8.0	4.7
1973	15.3	7.4	4.5

Source: Department of Labor, Bureau of Labor Statistics.
a Defined as the number of injuries per 100 man-years of work; prior to 1971, "Injury Frequency Rates" were defined as the number of disabling injuries per million employee-hours worked.
b Data not available for guided missiles and spacecraft prior to 1972.
N.A. Not available.

WORK STOPPAGES IN THE AIRCRAFT AND PARTS INDUSTRY

Calendar Years 1961 to Date

Year	Number of Strikes	Number of Workers Involved	Man-Days Idle in Year
1961	14	2,440	35,000
1962	19	23,000	555,000
1963	12	7,510	53,700
1964	19	20,300	160,000
1965	22	74,900	946,000
1966	23	38,000	204,000
1967	22	28,800	161,000
1968	46	45,500	594,300
1969	26	76,400	1,564,600
1970	12	6,800	552,500
1971	24	17,200	465,500
1972	18	20,800	148,100
1973	13	4,531	99,145

Source: Department of Labor, Bureau of Labor Statistics, Division of Wages and Industrial Relations.
NOTE: The "aircraft and parts industry" to which this table applies includes substantial missile and spacecraft employment. It represents approximately 60 per cent of total aerospace employment.

EMPLOYMENT OF SCIENTISTS AND ENGINEERS FOR RESEARCH AND DEVELOPMENT

Total and Aerospace
1960 to Date

As of January 1	TOTAL	Aerospace	Aerospace as a Percent of Total
1960	292,000	72,400	24.8%
1961	312,100	78,500	25.2
1962	312,000	79,400	25.4
1963	327,300	90,700	27.7
1964	340,200	101,100	29.7
1965	343,600	99,200	28.9
1966	353,200	99,300	28.1
1967	367,200	100,400	27.3
1968	376,700	101,100	26.8
1969[r]	387,100	99,900	25.8
1970	384,100	92,600	24.1
1971[r]	366,800	78,300	21.3
1972[r]	349,900	71,200	20.3
1973[r]	356,600	72,300	20.3
1974	360,600	70,300	19.5

Source: National Science Foundation.
NOTE: Scientists and engineers working less than full time have been included in terms of their full time equivalent number.
r Revised.

EMPLOYMENT ON NATIONAL AERONAUTICS AND SPACE ADMINISTRATION PROGRAMS

1960 to Date

As of June 30	TOTAL	NASA Employees	Contractor Employees[E]
1960	46,768	10,268	36,500
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[E]	125,716	24,316	101,400
1976[E]	131,616	24,316	107,300

Source: NASA, Briefing on the Budget of the United States, February 3, 1975.
E Estimate.

Finance

The aerospace industry recorded a net profit after taxes of 3 percent on sales for 1974 compared to 2.9 percent for 1973. This slight increase represented continuance of a trend that began in 1970 when profit levels hit 2 percent, a ten-year low. Net profits from operations were up to $1.8 billion, some $200 million over the previous year. Net profits retained in the business, however, increased only $17 million from the $571 million level of 1973. Profit figures, because of the extraordinary economic situation in the U.S. during 1974, should be analyzed with caution. In a year beset with numerous economic dislocations and unexplainable trends, many U.S. corporations reported record profits but found them more illusory than real due to the eroding effect of double-digit inflation, coupled with concomitant increases in interest charges and other business costs.

At the end of 1974 total assets and stockholders' equity for the aerospace industry were up over the 1973 levels. Increases in assets were primarily attributable to adjustments in inventories which increased by 8.3 percent; receivables on the other hand declined by 4.5 percent. Additions to plant and equipment remained level, but other non-current assets were up about 8 percent from the previous year. Total liabilities increased to $16.2 billion, up some $720 million from 1973, but long-term debt was reduced slightly. Working capital was reduced modestly by $87 million.

Despite some improvement in the financial picture as compared with recent years, the aerospace industry's profit margin continued well below the average for the manufacturing community as a whole. In terms of profit to sales margin, the 3 percent figure for the aerospace industry compared with 5.4 percent for all manufacturing.

In a development that warranted optimism for the industry's future financial posture, DOD in 1974 took note of the low aerospace return in comparison with other industries. DOD is convinced that defense industry profits, and particularly those of the aerospace industry, are well below those of other industries and the situation poses serious challenges to the preservation of a healthy and competitive defense industry.

During 1974 there was a slight realignment of contract awards by geographic regions. The Pacific Coast was the primary loser in both aircraft and missiles and space systems, dropping 8.5 percent for aircraft and over 9 percent for missiles and space systems. Part of that drop was countered by an increase in electronics and communications awards of over 26 percent. The primary gainer was New England where aircraft contracts jumped from less than 12 percent of the total awards in 1973 to 20 percent of the national total in 1974. New England also increased its share of missile and space systems work but remained static in electronics and communications.

Among the major defense contractors, General Dynamics replaced Lockheed which had maintained the number one position in new defense contracts for a period of five years. Lockheed dropped to second position as McDonnell Douglas moved into third place. General Electric moved from second to fifth rank and Boeing slipped from third to sixth place and thus out of the top five.

Also during the year the principal NASA contractors remained substantially unchanged, although the number two and three contractors exchanged places in the ranking. Rockwell International remained the number one contractor for that agency.

INCOME ACCOUNTS
AEROSPACE COMPANIES

Calendar Years 1970 to Date
(Millions of Dollars)

	1970	1971	1972	1973	1974
Net Sales	$ 25,505	$ 23,566	$ 24,838	$ 29,494	$ 31,324
Net Profit from Operations	980	893	1,254	1,619	1,823
Total Income before Federal Income Taxes	881	761	1,103	1,449	1,451
Provision for Federal Income Taxes . . .	380	338	494	593	582
As a Percent of Total Income .	43.1%	44.4%	44.8%	40.9%	40.1%
Net Profit after Taxes.	501	423	609	855	938
As a Percent of Net Sales	2.0%	1.8%	2.4%	2.9%	3.0%
Net Profit Retained in Business	237	181	340	571	588

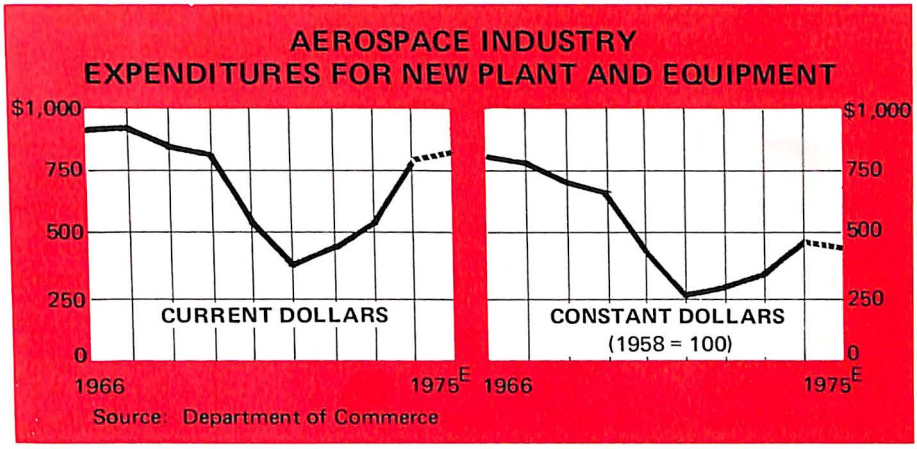
Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations."
NOTE: Does not include data for companies which produce aerospace products but are classified in other than industry group 372.

BALANCE SHEET COMPARISONS
AEROSPACE COMPANIES

Calendar Years 1970 to Date
(Millions of Dollars)

	1970	1971	1972	1973	1974
Assets:					
Current Assets					
Cash	$ 758	$ 844	$ 685	$ 643	$ 587
U.S. Government Securities	9	4	11	80	17
Other Securities	—	—	—	—	197
Total Cash and U.S. Government Securities	$ 767	$ 848	$ 696	$ 723	$ 800
Receivables (total)	3,254	3,400	3,276	3,621	3,458
Inventories (gross)	10,763	10,589	10,918	11,559	12,522
Other current assets	467	458	608	525	460
Total Current Assets	$15,251	$15,295	$15,498	$16,428	$17,239
Total Net Plant	4,527	4,296	4,108	4,376	4,383
Other Non-Current Assets	2,639	2,789	2,998	3,173	3,426
Total Assets	$22,417	$22,379	$22,604	$23,976	$25,048
Liabilities:					
Current Liabilities					
Short Term Loans	$ 1,146	$ 1,152	$ 649	$ 934	$ 1,115
Advances by U.S. Govt.	4,241	2,837	2,210	2,456	2,821
Trade accounts and notes payable	2,212	1,860	2,048	2,111	2,250
Federal income taxes accrued	455	463	638	720	868
Installments due on long term debts	338	325	272	359	385
Other current liabilities	2,148	3,870	4,048	4,223	4,264
Total Current Liabilities	$10,540	$10,507	$ 9,865	$10,803	$11,702
Long Term Debt	4,113	4,004	4,351	4,159	4,103
Other Non-Current Liabilities	514	551	571	540	419
Total Liabilities	$15,167	$15,062	$14,787	$15,502	$16,223
Stockholders' Equity:					
Capital Stock	$ 2,491	$ 2,541	$ 2,763	$ 2,758	$ 3,198
Earned Surplus and Reserves	4,757	4,776	5,053	5,717	5,627
Total Net Worth	$ 7,248	$ 7,317	$ 7,816	$ 8,475	$ 8,825
Total Liabilities and Stockholders' Equity	$22,417	$22,379	$22,604	$23,976	$25,048
Net Working Capital	$ 4,711	$ 4,788	$ 5,633	$ 5,625	$ 5,538

Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations."
NOTE: Includes 72 companies classified in industry group 372 which filed reports with the Securities and Exchange Commission.



NEW PLANT AND EQUIPMENT EXPENDITURES

Calendar Years 1960 to Date
(Billions of Dollars)

Year	All Industries	All Manufacturing Industries	Durable Goods	Aerospace
1960	$ 36.75	$ 15.09	$ 7.23	$ 0.34
1961	35.91	14.33	6.31	0.30
1962	38.39	15.06	6.79	0.40
1963	40.77	16.22	7.53	0.45
1964	46.97	19.34	9.28	0.42
1965	54.42	23.44	11.50	0.46
1966	63.51	28.20	14.96	0.92
1967	65.47	28.51	14.06	0.93
1968	67.76	28.37	14.12	0.86
1969	75.56	31.68	15.96	0.83
1970	79.71	31.95	15.80	0.55
1971	81.21	29.99	14.15	0.38
1972	88.44	31.35	15.64	0.43
1973r	99.74	38.01	19.25	0.53
1974	112.40	46.01	22.62	0.80
1975E	116.06	49.30	22.62	0.82

Source: 1960–1967: U.S. Department of Commerce, Survey of Current Business, Jan. 1970; 1968–1971: U.S. Department of Commerce, Securities and Exchange Commission, Joint Statistical Report; 1972–1975: U.S. Department of Commerce, Bureau of Economic Analysis, BEA 74-14, BEA 75-15.

E Estimate, based on a BEA survey conducted in January and February 1975.

r Revised.

MILITARY PRIME CONTRACT AWARDS OF $10,000 OR MORE FOR SELECTED MAJOR MILITARY HARD GOODS

By Geographic Region
Fiscal Years[a] 1972, 1973, 1974

Program and Region	Millions of Dollars			Percent of Program Total		
	1972	1973	1974	1972	1973	1974
AIRCRAFT–TOTAL	$8,617	$7,442	$7,283	100.0%	100.0%	100.0%
New England	955	867	1,456	11.1	11.6	20.0
Middle Atlantic	1,476	1,240	1,148	17.1	16.7	15.8
East North Central	614	638	594	7.1	8.6	8.2
West North Central	1,703	1,132	1,289	19.8	15.2	17.7
South Atlantic	1,017	509	378	11.8	6.8	5.2
East South Central	74	69	74	0.9	0.9	1.0
West South Central	1,341	1,189	698	15.6	16.0	9.6
Mountain	77	77	71	0.9	1.0	1.0
Pacific[b]	1,360	1,721	1,575	15.8	23.1	21.6
MISSILE & SPACE SYSTEMS–TOTAL	$5,219	$4,891	$4,654	100.0%	100.0%	100.0%
New England	601	701	718	11.5	14.3	15.4
Middle Atlantic	743	618	538	14.2	12.6	11.6
East North Central	153	138	219	2.9	2.8	4.7
West North Central	110	69	117	2.1	1.4	2.5
South Atlantic	735	468	399	14.1	9.6	8.6
East South Central	59	69	72	1.1	1.4	1.5
West South Central	73	65	32	1.4	1.3	0.7
Mountain	389	411	425	7.5	8.4	9.1
Pacific[b]	2,356	2,352	2,134	45.1	48.1	45.8
ELECTRONICS & COMMUNICATIONS EQUIPMENT–TOTAL	$4,104	$3,889	$4,184	100.0%	100.0%	100.0%
New England	498	461	487	12.1	11.8	11.6
Middle Atlantic	935	941	790	22.8	24.2	18.9
East North Central	385	238	280	9.4	6.1	6.7
West North Central	150	158	149	3.7	4.1	3.6
South Atlantic	606	585	661	14.8	15.0	15.8
East South Central	21	27	27	0.5	0.7	0.7
West South Central	275	203	219	6.7	5.2	5.2
Mountain	81	146	142	2.0	3.8	3.4
Pacific[b]	1,153	1,130	1,429	28.1	29.0	34.2

Source: Department of Defense, Office of the Secretary of Defense, Directorate for Information Operations, "Military Prime Contract Awards by Region and State, Fiscal Years 1972, 1973, 1974."

a Fiscal Years ending June 30.

b Includes Alaska and Hawaii.

MILITARY PRIME CONTRACT AWARDS OF $10,000 OR MORE FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION

By Region and Type of Contractors
Fiscal Year[a] 1974

Region	TOTAL	Type of Contractor		
		Educational Institutions	Other Non-Profit Institutions[b]	Business Firms
VALUE - Millions of Dollars				
TOTAL	$ 5,739	$ 323	$ 312	$ 5,104
New England	913	89	124	700
Middle Atlantic	877	25	11	841
East North Central	347	23	18	306
West North Central	282	3	2	277
South Atlantic	624	108	45	471
South Central	292	16	8	268
Mountain	124	17	1	106
Pacific[c]	2,280	42	103	2,135
PERCENT OF TOTAL	100.0%	100.0%	100.0%	100.0%
New England	15.9%	27.5%	39.8%	13.7%
Middle Atlantic	15.3	7.9	3.4	16.5
East North Central	6.1	7.3	5.8	6.0
West North Central	4.9	0.9	0.5	5.4
South Atlantic	10.9	33.5	14.3	9.2
South Central	5.1	4.8	2.6	5.2
Mountain	2.2	5.3	0.5	2.1
Pacific[c]	39.7	12.8	33.1	41.8

Source: Department of Defense, Office of the Secretary of Defense, Directorate for Information Operations "Military Prime Contract Awards by Region and State, Fiscal Years 1972, 1973, 1974."

a Fiscal Year ending June 30.
b Includes contracts with other government agencies.
c Includes Alaska and Hawaii.

MAJOR DEFENSE CONTRACTORS

Listed by rank according to net value of military prime contracts awarded during Fiscal Year[a] 1974 (Millions of Dollars)

	1970	1971	1972	1973	1974
U.S. TOTAL, ALL CONTRACTS	$31,315	$29,752	$33,362	$31,627	$34,357
General Dynamics Corp.	1,183	1,489	1,289	707	1,853
Lockheed Aircraft Corp.	1,848	1,511	1,705	1,659	1,464
McDonnell Douglas Corp.	883	897	1,700	1,143	1,309
United Aircraft Corp.	874	733	996	741	1,212
General Electric Co.	1,001	1,041	1,259	1,416	1,211
Boeing Co.	475	732	1,171	1,229	1,076
Litton Industries, Inc.	543	516	616	424	926
Hughes Aircraft Co.	497	516	688	547	825
Rockwell International Corp.	707	478	703	704	819
Raytheon Co.	380	455	507	680	740
American Telephone & Telegraph Co.	931	1,200	1,122	775	691
Grumman Corp.	661	1,098	1,120	909	687
Northrop Corp.	184	151	370	446	491
Westinghouse Electric Corp.	418	437	387	505	461
Textron Inc.	431	325	242	747	418
Chrysler Corp.	92	155	94	152	412
Sperry Rand Corp.	399	359	414	447	393
F M C Corp.	141	127	180	100	351
EXXON Corp.	229	187	209	238	340
General Motors Corp.	386	344	256	249	300
Honeywell Inc.	398	237	334	272	281
LTV Corp.	479	725	449	347	268
Standard Oil Co. of California	140	125	146	132	267
Tenneco Inc.	249	917	505	214	264
IBM Corp.	256	316	260	302	252
Martin Marietta Corp.	251	187	256	225	246
RCA Corp.	263	251	275	254	243
Intern'l Telephone & Telegraph Corp.	217	233	258	249	237
Teledyne Inc.	238	216	180	188	228
TRW Inc.	179	177	146	177	203

Source: Department of Defense, "100 Companies and Their Subsidiary Corporations Listed According to Net Value of Military Prime Contract Awards," (Annually).

a Fiscal Years ending June 30.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Major Contractors listed by rank according to net value of NASA prime contracts awarded during Fiscal Year[a] 1974 (Millions of Dollars)

Company	1970	1971	1972	1973	1974
U. S. TOTAL, ALL CONTRACTS . . .	$2,759.2	$2,279.5	$2,143.3	$2,063.8	$2,118.6
Rockwell International Corp.	531.5	172.5	175.1	317.8	486.5
Martin Marietta Corp.	108.0	107.6	208.4	192.0	201.8
McDonnell Douglas Corp.	236.3	302.9	343.1	272.4	156.0
Bendix Corp.	109.8	121.4	88.0	79.1	79.8
General Dynamics Corp.	38.0	50.8	66.6	80.4	79.5
General Electric Co.	131.7	161.4	114.9	86.9	65.0
Boeing Co.	158.6	114.4	94.2	75.5	60.0
International Business Machines Corp. .	133.4	72.4	72.0	61.3	47.5
United Aircraft Corp.	27.1	28.4	15.9	25.0	39.7
Philco-Ford Corp.	24.0	23.1	36.2	37.5	36.0
Lockheed Electronics[b]	(b)	26.5	24.4	29.3	35.4
RCA Corp.	54.5	93.9	57.2	38.2	34.7
Computer Sciences Corp.	11.0	17.4	23.3	25.1	27.4
Sperry Rand Corp.	48.1	31.7	33.5	26.6	21.7
Federal Electric Corp.	26.3	21.8	23.5	24.8	20.9
TRW, Inc.	58.3	62.3	33.3	28.2	20.8
Hughes Aircraft Co.	9.0	20.9	22.0	20.9	18.0
LTV Aerospace Corp.	17.9	15.4	21.9	19.9	17.2
Thiokol Corp.	2.0	4.2	3.0	4.2	17.0
American Airlines, Inc.	(c)	(c)	(c)	(c)	16.9
Northrop Services, Inc.[d]	(d)	1.5	4.9	16.5	16.3
Chrysler Corp.	16.7	15.3	24.3	27.7	16.1
Morrison, Knudsen Co., Inc.	(c)	(c)	(c)	4.8	15.6
Fairchild Industries	1.9	16.4	42.0	43.7	13.0
Honeywell, Inc.	11.5	11.9	11.1	12.4	12.3
Teledyne Industries, Inc.[e]	(e)	6.7	6.0	9.8	12.3
Litton Systems, Inc.	1.8	(c)	6.0	11.2	11.3
Grumman Aerospace Corp.	284.4	113.7	28.5	12.0	11.1
Harris Corp.	(c)	(c)	(c)	(c)	10.6
Textron, Inc.	4.2	4.5	5.4	3.2	10.1

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

a Fiscal Years ending June 30.
b Included with Lockheed Aircraft Corp. prior to 1971.
c Not in list of major contractors for indicated year.
d Included with Northrop Corp. prior to 1971.
e Included with Teledyne, Inc. prior to 1971.

Glossary

Accessions, the total number of permanent and temporary additions to the employment roll, including both new and rehired employees (see **Labor Turnover**).

Aerospace Industry, the industry primarily engaged in the manufacture of aircraft, guided missiles, spacecraft—i.e., all air and space vehicles and their related components and parts.

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

Air Carriers, the commercial system of air transportation. Consists of scheduled domestic and (U.S.) international air carriers, supplemental and other carriers.

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 Industry, the industry primarily engaged in the manufacture of aircraft, aircraft engines and parts, aircraft propellers and parts, and aircraft parts 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 engines, accessories 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 or 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 objects through space.

Average Hourly Earnings, see **Earnings.**

Average Weekly Earnings, see **Earnings.**

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

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. (Some agencies still use the term **New Obligational Authority** when referring to **Budget Authority.**)

Constant Dollars, see **Deflators.**

Deflators (Constant Dollars), used to reduce a price level. The Gross National Product in constant dollars is arrived at by dividing components of the current dollar figures by appropriate price indexes. Several hundred price indexes are combined to "deflate" the current dollar series. Seasonal variations are eliminated from the price series used.

Depreciation, the general conversion of the depreciable cost of a fixed asset into expense, spread over its remaining life. There are numerous 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 **Research**).

DOD, Department of Defense.

Durable Goods Industry, comprises major manufacturing industry groups with Standard Industrial Classification Codes 19, 24, 25, and 32 through 39. All other major manufacturing industry groups in SIC Codes 19 through 39 are considered as nondurable goods manufacturing industry groups.

Earnings, the actual return to the worker for a stated period of time while rates are the amounts stipulated for a given unit of work or time. Irregular bonuses, retroactive items, payments of various welfare benefits, payroll taxes paid by employers are excluded.

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

ERDA, Energy, Research and Development Administration. ERDA was formed in 1974 to bring together activities previously scattered among several agencies. The major elements covered are nuclear energy, fossil energy, solar and geothermal energy, conservation through increased efficiency, and environmental controls.

Establishment, the basis for reporting to the Census of Manufactures. It is an operating facility in a single location. Where one facility engages in different lines of activity it is required to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

Evaluation (Department of Defense), determination of technical suitability of material, equipment or a system.

Expenditures (Federal Budget), see **Outlays.**

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

FAA, Federal Aviation Administration (formerly the Federal Aviation Agency), part of the Department of Transportation.

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

Fiscal Year (Federal Budget), year beginning July 1 and ending June 30, and designated by the calendar year in which it ends. See **Transition Quarter.**

FY, see **Fiscal Year.**

General Aviation, all civil flying except that of the trunk, regional and supplemental airlines.

GNP (Gross National Product), the market value of the total output of goods and services produced by the Nation's economy before deduction of depreciation charges and other allowances for business and institutional consumption of durable goods. It includes the purchase of goods and services by consumers and government, gross private domestic investment, and net exports. Beginning with 1960, the estimates include data for Alaska and Hawaii.

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—a vertical and/or short take-off and landing aircraft.

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

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

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

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

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

Income

Net Operating Income, total net sales (see **Sales**) less total operating costs.

Net Income (Before Income Taxes), Net Operating Income plus or minus "Other Income and Expense."

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

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

Labor Turnover, the gross movement of wage and salary workers into and out of employed status with respect to individual establishments. This movement, which relates to a calendar month, is divided into two broad types: accessions (new hires and rehires) and separations (terminations of employment initiated by either employer or employee). Each type of action is accumulated for a calendar month and expressed as a rate per 100 employees. The data relate to all employees, full- or part-time, permanent or temporary,

including executive, office, sales, other salaried personnel, and production workers.

Accessions, the total number of permanent and temporary additions to the employment roll, including both new and rehired employees.

New Hires, temporary or permanent additions to the employment roll of persons who have never before been employed in the establishment.

Other Accessions, not published separately, but included in total accessions; all additions to the employment roll which are not classified as new hires.

Separations, terminations of employment during the calendar month or year, classified according to cause: quits, layoffs, and other separations, as defined below:

Quits, terminations of employment initiated by employees, failure to report after being hired, and unauthorized absences.

Layoffs, suspensions without pay lasting or expected to last more than seven consecutive calendar days, initiated by the employer without prejudice to the worker.

Other Separations, terminations of employment because of discharge, permanent disability, death, retirement, etc.

Man-Hours, in measuring labor input, take into account both the number of production workers and their actual hours of work. The Bureau of Labor Statistics covers all hours paid for, whether worked or not, when the employee was at the plant. One man-hour thus means one hour of a person's time.

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

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

Military Assistance, see **Mutual Security Program.**

Missile, a weapon which travels through space, guided along its flight path at the moment of its launching, but thereafter subjected to various external forces that affect the accuracy and speed with which it flies toward the target.

Mutual Security Program, designed by the U.S. Government to maintain the domestic security, promote foreign policy, and provide for the general welfare of the U.S.; based on the Mutual Security Act of 1954.

NASA, National Aeronautics and Space Administration.

N.A.T.O., North Atlantic Treaty Organization.

Net Assets, see **Assets, Net.**

Net Income, see **Income.**

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

Net Operating Profit, see **Income.**

Net Profit on Sales, see **Income.**

Net Sales, see **Sales.**

New Hires, see **Labor Turnover.**

Non-Aerospace Products and Services, includes all nonaircraft, nonspace vehicle, and nonmissile products and services and all basic research produced or performed by those companies and/or establishments whose principal business is the development and/or production of aircraft, aircraft engines, missile and spacecraft engines, missiles and/or spacecraft.

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.

Other Aerospace Products and Services, all conversions, modifications, site activation, other aerospace products (including drones) and services, and receipts for applied research and development on items such as drones, etc.

Outlays, checks issued, interest accrued on the public debt, or other payments made, net of refunds and reimbursements. (Some agencies still use the term **Expenditures** when referring to **Outlays.**)

Overtime, see **Hours, Overtime.**

Payroll, includes the gross earning paid in the calendar year to all employees on the payroll of operating manufacturing establishments. Includes all forms of compensation 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.

Passenger Mile, one passenger moved one mile.

Procurement, the process whereby the executive agencies of the federal government acquire goods and services from enterprises other than the federal government.

Profit, see **Income.**

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

Quits, see **Labor Turnover.**

Research and Development, research, basic and applied, is systematic, intensive study directed towards fuller scientific knowledge of the subject studied.

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

R & D, research and development.

RDT&E (Department of Defense), research, development, test and evaluation.

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., by airfoils rotating or revolving about an axis (see **Helicopter.**)

Sales, net of returns, allowances and discounts; the dollar value of shipments less returns and allowances, including dealer's commission, if any.

Satellite, a body that rotates about another body, such as the Moon revolving around the Earth, or a man-made object rotating about any body such as the Sun, Earth or Moon.

Separations, see **Labor Turnover.**

Space Vehicle, an artificial body operating in outer space; may be manned or pilotless.

Stockholders' 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 Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations."

STOL, short takeoff 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, the three-month interval from July 1, 1976 to September 30, 1976. Beginning with the 1977 budget, the fiscal year (FY) will run from October 1 through September 30. To facilitate the conversion, this transition period has been provided between FY 1976 and FY 1977 as a separate accounting period belonging to neither year. The budget will continue to be submitted near the beginning of each session of Congress. The change is being made to allow Congress additional time to review the President's budget. Public Law 93–554 extends the availability of appropriations until September 30 of FY 1976 (and, of course, for each subsequent year). It does not permit obligation in 1976 of budget authority provided for the transition quarter.

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 "turbo-jet".

U.K., United Kingdom.

U.S., United States.

USA, United States Army.

USAF, United States Air Force.

USN, United States Navy.

USSR, Union of Soviet Socialist Republics.

Utility Aircraft, an aircraft designed for general purpose work.

V/STOL, vertical or short takeoff and landing aircraft.

VTOL, vertical takeoff and landing aircraft.

Wages, the payroll (see **Payroll**) of production and related workers.

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