

Aerospace Facts and Figures 1972/73



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AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

Aerospace Facts and Figures 1972/73



COMPILED BY THE OFFICE OF PUBLIC AFFAIRS

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AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.



FOREWORD

This 20th edition of *Aerospace Facts and Figures*, like its predecessors, is designed to serve legislators, writers and editors, administrators and managers in industry, analysts, and teachers and students as a standard reference work concerning the aerospace industry.

It is an effort by the Aerospace Industries Association to set forth the basic economics of the industry and its level of effort in various fields of activity.

The state of the aerospace industry today, as indicated in this volume, is one of continuing decline in almost all areas of activity. This decline, which was predicted in 1970 and 1971, did show some levelling trends which may presage a bottoming out and a possible modest upturn in 1973 or soon thereafter.

Among the basic economic indicators of continued decline in the aerospace industry in 1971 were:

- *Sales:* Aircraft sales to all customers fell by \$1.2 billion during the 1970-1971 period, pulling overall sales of the aerospace industry down from \$24.9 billion in 1970 to \$23.2 billion in 1971. This was the third consecutive year of declining sales.

- *Profits:* Aerospace industry profits (as a percentage of sales after taxes) declined from 2.0 percent in 1970 to 1.8 percent in 1971, about 56 percent lower than the profits for all manufacturing industries.

- *Employment:* During 1971 the work force in the U.S. aerospace industry declined by another 230,000—or from a high of 1,502,000 in 1968 to 969,000 during 1971. This is a drop of 35 percent in three years, and a drop of 19 percent from the 1970 level of 1,199,000.

- *Backlog:* The backlog of orders throughout the aerospace industry reached a high point of \$30.7 billion in 1968. By 1970 it had dropped to \$24.7 billion (down 20 percent). In 1971, the overall backlog of orders

was reduced to \$21.8 billion, a decrease of 12 percent from the preceding year and 29 percent from the 1968 high point.

- *Research and Development:* It is interesting to note that while the total of Federal and corporate spending for all R&D declined from \$18.3 billion in 1969 to \$17.9 billion in 1970 (a drop of \$400 million), the aerospace industry share of the overall program dropped by \$600 million (from \$5.8 billion to \$5.2 billion).

- *Aircraft Production:* In 1971, for the third consecutive year, aircraft production declined. However, the 9.6 percent drop from 10,558 aircraft produced in 1970 to 9,548 in 1971 did show a levelling trend in comparison to the 37 percent decline between 1969 and 1970.

There were two bright aspects of the aerospace picture in 1971, aspects that may be less bright in the years ahead.

- *Balance of Trade:* For the eighth consecutive year, the net balance of U.S. aerospace exports *versus* imports continued to climb. In 1971 the net positive figure was \$3.9 billion, the largest segment of which can be attributed to the sale of U.S.-made commercial jet transports. This bright spot is expected to fade during the next two or three years as orders for current models are filled; this trend can be expected to continue as foreign manufacturers move into market segments in which the United States, at this time, is not competing—short landing and takeoff passenger aircraft, short-range jet airbuses, and supersonic transports.

- *Aircraft in Use:* U.S.-built commercial aircraft continue to dominate the fleets of free world airlines. In 1970 some 76.4 percent of such aircraft in operation were U.S.-built. This amounted to 3,042 units out of 3,983 in use. The U.S. share of the market in 1969 was 75.8 percent.

The basic data for this volume comes from the best sources available, including the Executive Office of the President (including the Office of Management and Budget); the Departments of Commerce (Bureau of the Census), Defense (Comptroller, Public Affairs, Army, Navy, Air Force), Labor (Bureau of Labor Statistics), Transportation (Federal Aviation Administration); Civil Aeronautics Board; Federal Communications Commission; Federal Trade Commission; National Aeronautics and Space Administration; Securities and Exchange Commission; Atomic Energy Commission; Air Transport Association; International Air Transport Association; General Aviation Manufacturers Association; Library of Congress; National Science Foundation; Export-Import Bank of the United States; International Civil Aviation Organization; and surveys of AIA member companies.

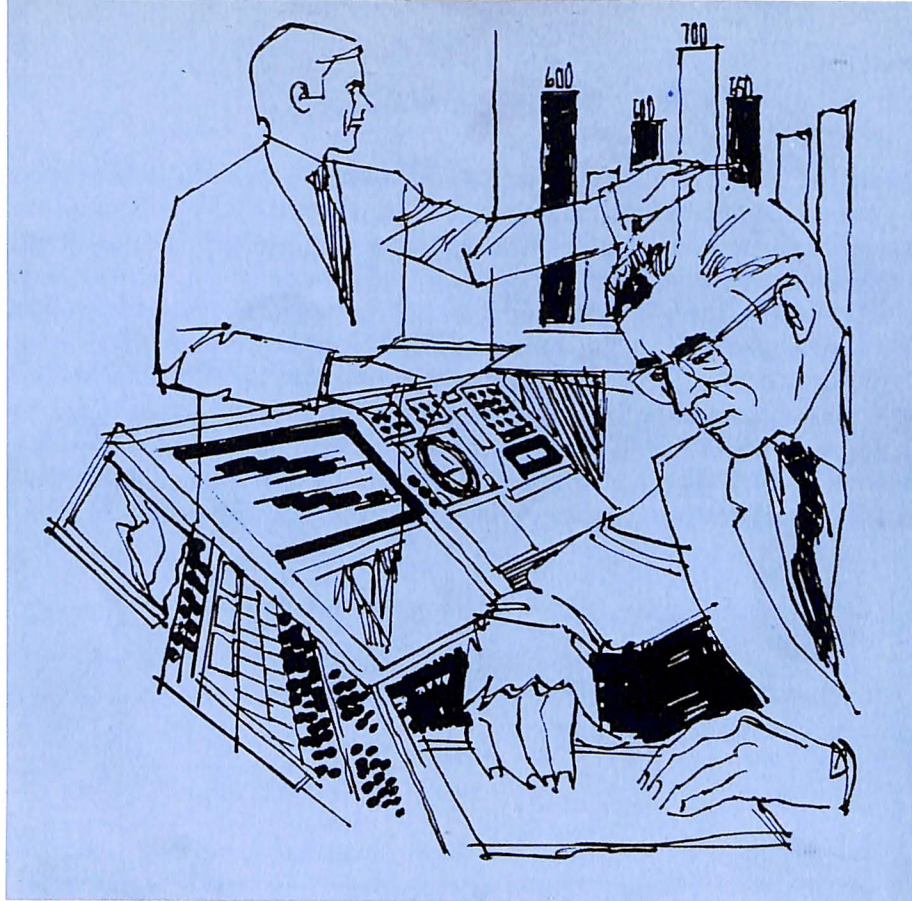
To all information sources we express appreciation for their cooperation in making this volume possible.

KARL G. HARR, JR.
President
Aerospace Industries Association

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Aerospace Summary

For the third consecutive year, sales of the aerospace industry continued to decline, dropping to \$23.2 billion in 1971 compared with \$24.9 billion in 1970. Largest decline was in aircraft sales which fell \$1.2 billion during the 1970-1971 period.

By major product group, 1971 sales were: aircraft, \$12.1 billion (compared with \$13.3 billion in 1970); missiles, \$5.4 billion (a slight decrease from 1970); space vehicles, \$3.2 billion (compared with \$3.6 billion in 1970); non-aerospace, \$2.5 billion (compared with \$2.6 billion in 1970).

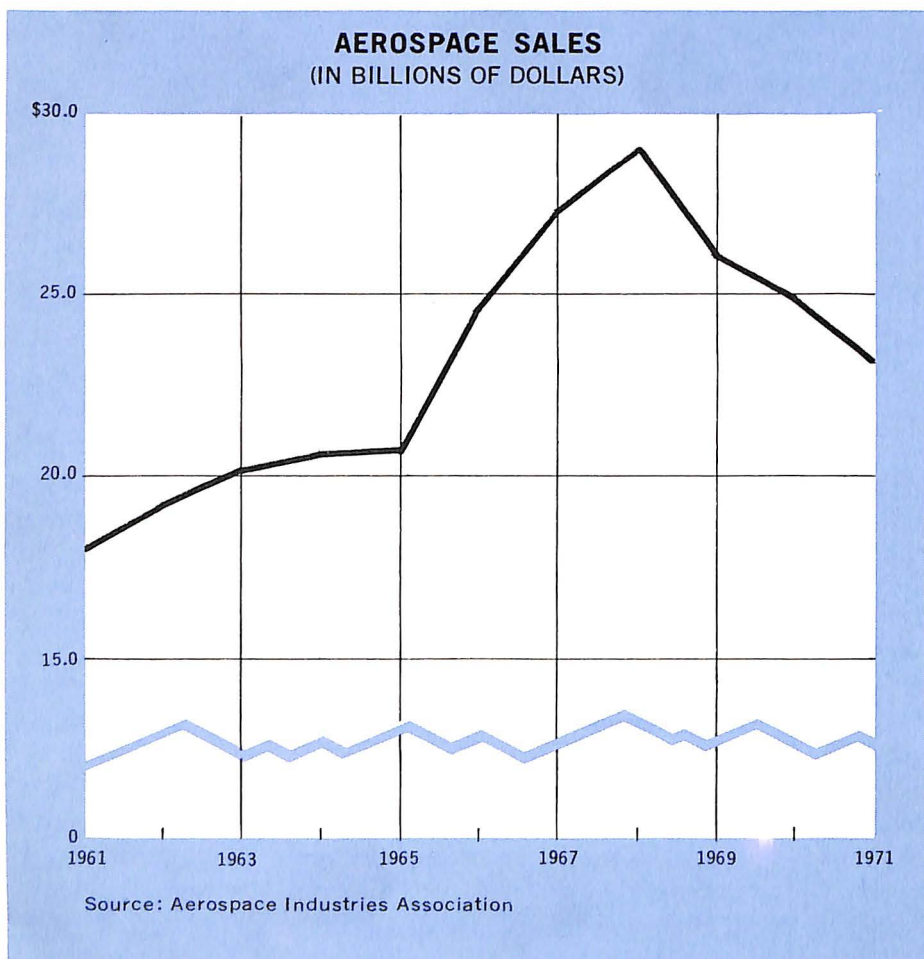
Net profits of the aerospace industry, as a percentage of sales, in 1971 dipped to the lowest point since 1961. Profits amounted to 1.8 percent of sales which compares to profits of all manufacturing corporations of 4.1 percent. The aerospace industry profit percentage in 1970 was 2.0 percent.

Backlog of the industry declined nearly \$3 billion in 1971 from 1970, the lowest total since 1965. Backlog at the end of 1971 was \$21.8 billion.

AEROSPACE FACTS AND FIGURES, 1972/73

All the decline was in the category of sales other than to the U.S. government. Government backlog increased almost \$500 million. The principal decline occurred in the backlog for aircraft and engines other than U.S. government.

In the same pattern as sales and backlog, employment declined for the third consecutive year, falling below one million workers for the first time in a decade. During 1971, employment was estimated at 969,000 employees (471,000 in production) which compares with an average 1,199,000 employees in 1970. This is about one-third less than the peak of 1,502,000 employees reported at the end of 1968. Aerospace during 1971 accounted for 5.2 percent of the employment for all manufacturing industries and 9.1



AEROSPACE SUMMARY

percent of all durable goods employment. Total aerospace payroll during 1971 amounted to \$10 billion compared with \$12 billion in 1970.

Despite emerging foreign competition, U.S. aerospace exports again were a positive factor in international trade and in total industry sales (more than 18 percent). Aerospace exports have exceeded \$1 billion since 1957, and in 1971 reached a record \$4.2 billion, accounting for nearly 10 percent of all exports of U.S. products. Civil transports accounted for the largest portion of total exports with \$1,567 million, other civil products amounted to \$1,472 million, and military exports reached \$1,157 million.

U.S.-built commercial transports continued to dominate the Free World's airline fleets. In 1969 there were 3,999 transports in operation of which

AEROSPACE SALES AND THE NATIONAL ECONOMY
Calendar Years 1960 to Date
(Dollar Figures in Billions)

Year Ending Decem- ber 31	Total Gross National Product	SALES OF			AEROSPACE SALES AS PERCENT OF		
		Manufac- turing Industries	Durable Goods Industry	Aero- space Industry	GNP	Manu- factur- ing In- dustries	Dur- able Goods
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	538.5	295.6	24.6	3.3	4.6	8.3
1967	793.5	548.5	299.7	27.3	3.4	5.0	9.1
1968 ^r	864.2	603.7	331.0	29.0	3.4	4.8	8.8
1969 ^r	929.1	643.5	354.5	26.1	2.8	4.1	7.4
1970 ^r	974.1	653.1	352.2	24.9	2.5	3.8	7.1
1971	1,046.8	695.0	378.6	23.2	2.2	3.3	6.1

^r Revised.

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 the Census.

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.

AEROSPACE FACTS AND FIGURES, 1972/73

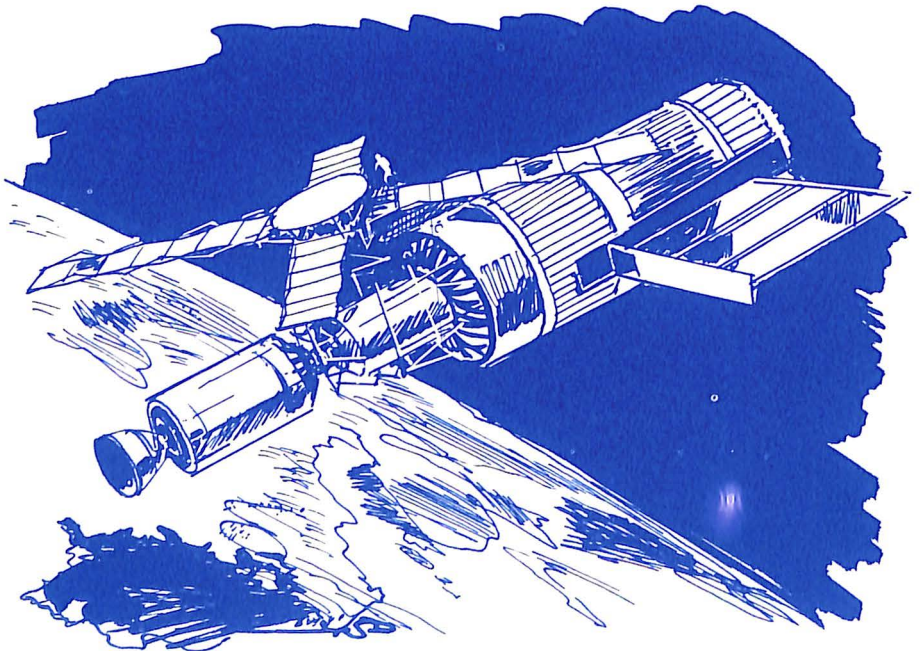
3,030 (75.8 percent) were made in the U.S. In 1970 total aircraft in airline operation amounted to 3,983 of which 3,042 (76.4 percent) were manufactured in the U.S.

Total Federal outlays for national defense reached a peak of \$81.2 billion in Fiscal Year 1969, dropping slightly to \$80.3 billion in FY 1970, and amounted to \$77.7 billion in FY 1971. Outlays for national defense are estimated at \$78.0 billion in FY 1972, rising to \$78.3 billion in FY 1973.

Total outlays for the National Aeronautics and Space Administration reached a high of \$5.9 billion in FY 1966. Outlays for NASA are estimated at \$3.2 billion in FY 1972 and approximately the same for FY 1973.

Viewed as a percentage of Federal dollar outlays between 1969 and 1973 (estimated), national defense spending has decreased from 43 percent to 31 percent and space research and technology (NASA) spending has decreased from 2 percent to 1 percent, while physical and human resources programs have increased from 43 percent to 54 percent in terms of dollar outlays.

Aerospace products and services as a percentage of total national defense and NASA outlays are estimated at 21.4 percent in FY 1972 and 19.5 percent in FY 1973.



AEROSPACE SUMMARY

ESTIMATED SALES OF THE AEROSPACE INDUSTRY, BY PRODUCT GROUP
Calendar Years 1948 to Date
(Millions of Dollars)

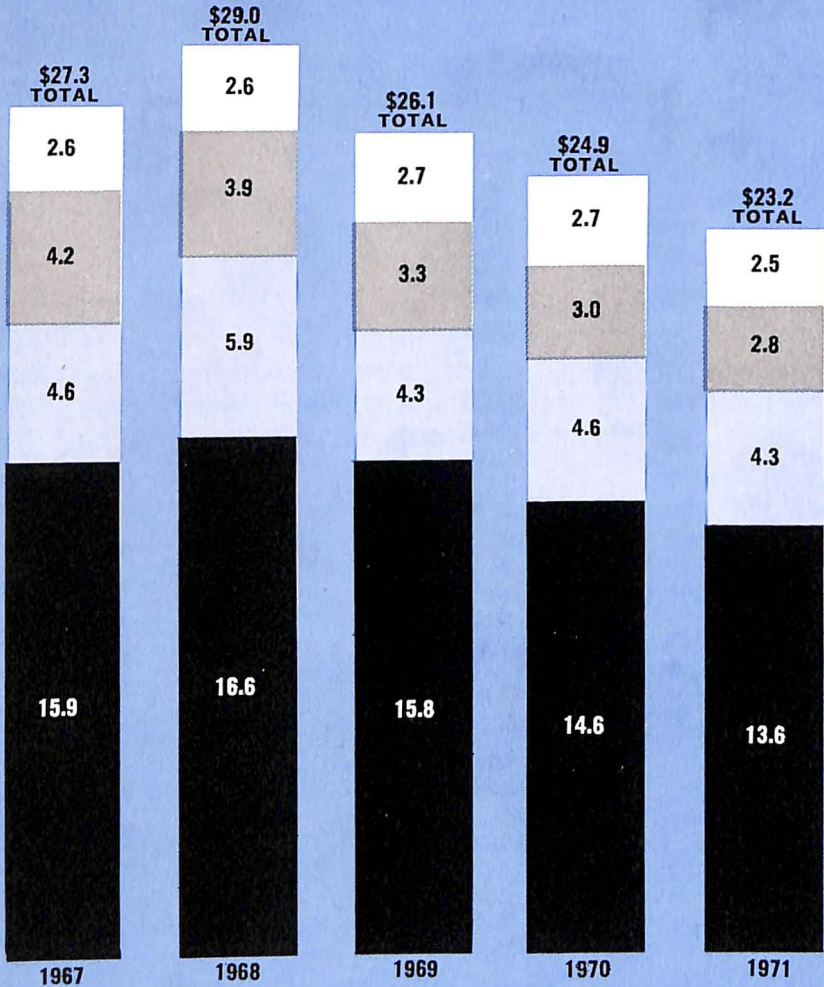
Year Ending December 31	TOTAL SALES	Product Group			
		Aircraft	Missiles	Space Vehicles	Non- aerospace
1948	\$ 1,493	\$ 1,359	—	—	\$ 134
1949	2,232	2,032	—	—	200
1950	3,116	2,731	\$ 105	—	280
1951	6,264	5,067	633	—	564
1952	10,130	8,442	776	—	912
1953	12,459	10,420	918	—	1,121
1954	12,807	10,460	1,194	—	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	9,126	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 ^r	24,930	13,293	5,379	3,614	2,644
1971	23,151	12,059	5,351	3,222	2,519

^r Revised.

NOTE: For explanation of "Aerospace Sales" see "Note" on page 7.

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

AEROSPACE SALES BY CUSTOMER
(IN BILLIONS OF DOLLARS)



- Non-Aerospace
- NASA & Other Government
- Civil
- Department of Defense

AEROSPACE SUMMARY

ESTIMATED SALES OF THE AEROSPACE INDUSTRY, BY CUSTOMER
(Millions of Dollars)
Calendar Years 1948 to Date

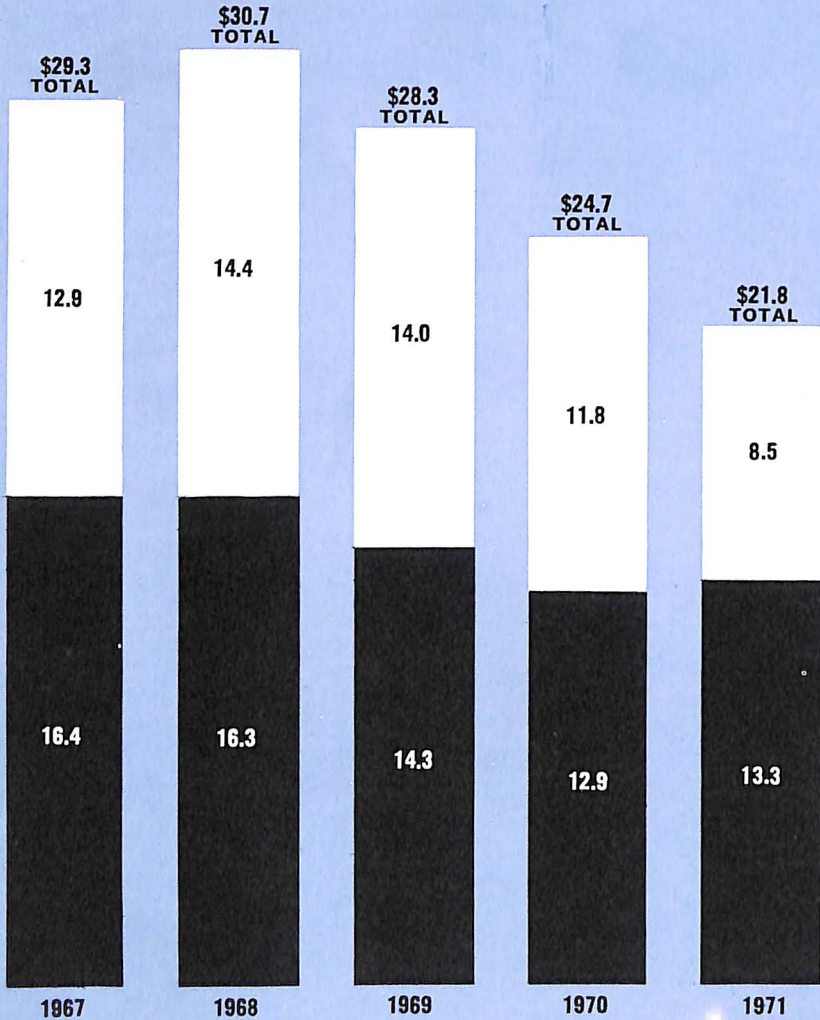
Year Ending December 31	TOTAL SALES	Aerospace Products and Services			Non- aerospace Products and Services
		Government		Non- govern- ment	
		Department of Defense	NASA and Other		
1948	\$ 1,493	\$ 1,182	—	\$ 177	\$ 134
1949	2,232	1,802	—	230	200
1950	3,116	2,598	—	238	280
1951	6,264	5,353	—	347	564
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 ^r	24,930	14,643	3,000	4,643	2,644
1971	23,151	13,553	2,777	4,302	2,519

^r Revised.

NOTE: For explanation of "Aerospace Sales" see "Notes" on page 7.

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

BACKLOG OF MAJOR AEROSPACE COMPANIES
(AS OF DECEMBER 31)
(IN BILLIONS OF DOLLARS)



Other Customers
U.S. Government

Source: Bureau of the Census

AEROSPACE SUMMARY

BACKLOG OF MAJOR AEROSPACE COMPANIES, By Product Group 1960 to Date (Millions of Dollars)

As of De- cember 31	GRAND TOTAL	TOTAL		Aircraft and Engines		Mis- siles & Space Incl. Propul- sion	Other Aerospace		Non- aero- space
		U.S. Govt.	Other	U.S. Govt.	Other		U.S. Govt.	Other	
1960	\$12,496	N.A.	N.A.	\$5,357	\$2,379	N.A.	N.A.	N.A.	\$4,760
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 ^r	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 ^r	28,297	14,298	13,999	7,089	12,099	4,338	2,001	880	1,890
1970 ^r	24,705	12,882	11,823	5,913	9,800	4,522	1,986	805	1,679
1971	21,808	13,330	8,478	5,821	6,012	4,664	1,936	1,043	2,332

^a Of this amount, sales of aircraft to the U. S. Government are \$7,071 million; to other customers are \$9,306 million. Total engine sales are \$4,251 million.

^r Revised.

NOTE: Based on reports from about 55 aerospace companies.

N.A.—Not available.

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).

SALES OF MAJOR AEROSPACE COMPANIES, By Product Group 1960 to Date (Millions of Dollars)

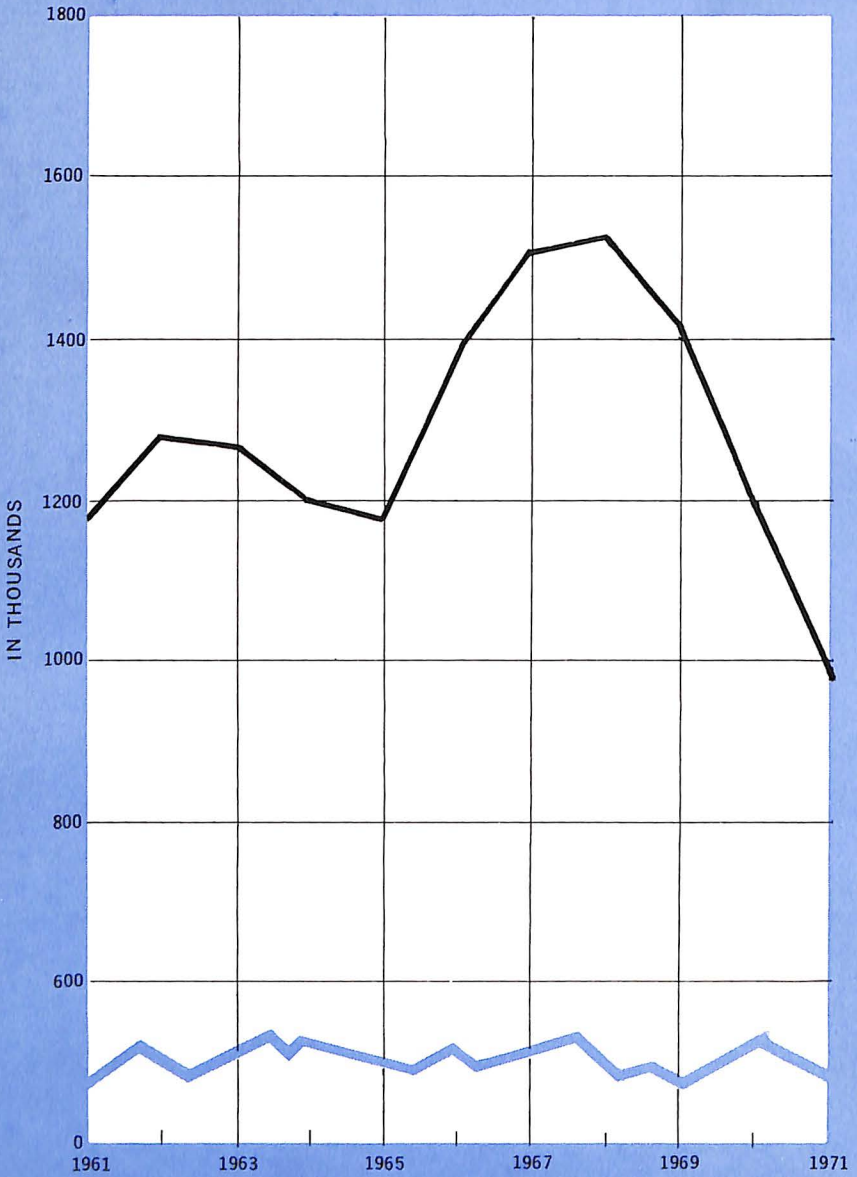
Year ending De- cember 31	GRAND TOTAL	TOTAL		Aircraft and Engines		Mis- siles & Space Incl. Propul- sion	Other Aerospace		Non- aero- space
		U.S. Govt.	Other	U.S. Govt.	Other		U.S. Govt.	Other	
1960	\$10,977	N.A.	N.A.	\$4,246	\$2,183	N.A.	N.A.	N.A.	\$4,568
1961	14,948	\$11,766	\$3,182	3,967	1,888	\$5,187	\$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 ^r	24,752	16,407	8,345	7,586	5,880	5,422	2,324	896	2,644
1971	21,625	14,066	7,559	6,212	5,075	5,003	1,937	879	2,519

^r Revised.

N.A.—Not available.

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly). Based on information from about 55 aerospace companies. Includes some duplication because of subcontracting between aerospace companies.

AEROSPACE EMPLOYMENT (ANNUAL AVERAGE)



Source: Aerospace Industries Association estimates

AEROSPACE SUMMARY

ANNUAL AVERAGE EMPLOYMENT IN ALL MANUFACTURING,
DURABLE GOODS AND AEROSPACE INDUSTRIES
Calendar Years 1961 to Date
(Thousands of Employees)

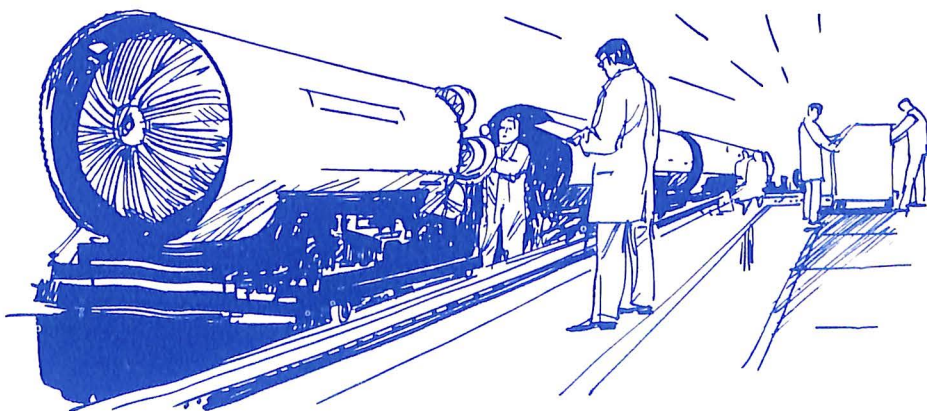
YEAR	ALL MANU- FACTURING INDUSTRIES	DURABLE GOODS INDUSTRIES	AEROSPACE INDUSTRY ^r		
			TOTAL	As Percent of	
				Manufac- turing	Durable Goods
1961	16,326	9,070	1,178	7.2	13.0
1962	16,853	9,480	1,270	7.5	13.4
1963	16,995	9,616	1,267	7.5	13.2
1964	17,274	9,816	1,209	7.0	12.3
1965	18,062 ^r	10,406 ^r	1,175	6.5	11.3
1966	19,214 ^r	11,284 ^r	1,375	7.2	12.2
1967	19,447 ^r	11,439 ^r	1,484	7.6	13.0
1968	19,781 ^r	11,626 ^r	1,502	7.6	12.9
1969	20,169	11,893	1,411	7.0	11.9
1970	19,393	11,203	1,199	6.2	10.7
1971 ^E	18,591	10,612	969	5.2	9.1

^r Revised.

^E Estimated.

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.).

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



AEROSPACE FACTS AND FIGURES, 1972/73

ESTIMATED EMPLOYMENT AND PAYROLL IN THE AEROSPACE INDUSTRY
Calendar Years 1961 to Date

YEAR	AEROSPACE EMPLOYMENT ^a (Thousands of Employees)			AEROSPACE PAYROLL (Millions of Dollars)			AEROSPACE as Percent of Total Manu- facturing	
	Total	Produc- tion Workers	Other ^b	Total	Produc- tion Workers	Other ^b	Em- ploy- ment	Pay- roll
1961	1,178	577	601	\$ 9,140	\$4,342	\$4,798	7.2	10.1
1962	1,270	596	674	10,232	4,871	5,361	7.5	10.5
1963	1,267	592	675	10,173	4,588	5,585	7.5	10.1
1964	1,209	572	637	10,067	4,563	5,504	7.0	9.4
1965	1,175	574	601	10,188	4,504	5,684	6.5	8.8
1966	1,375	706	669	12,139	5,641	6,498	7.2	9.4
1967	1,484	778	706	13,727	6,382	7,345	7.6	10.2
1968	1,502	779	723	14,397	6,582	7,815	7.6	9.9
1969	1,411	715	696	14,649	6,401	8,248	7.0	9.3
1970	1,199	603	596	12,079	5,252	6,827	6.2	7.6
1971	969	471	498	10,059	4,243	5,816	5.2	6.3

^a See "NOTE" page 15 for a description of Aerospace Employment.

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

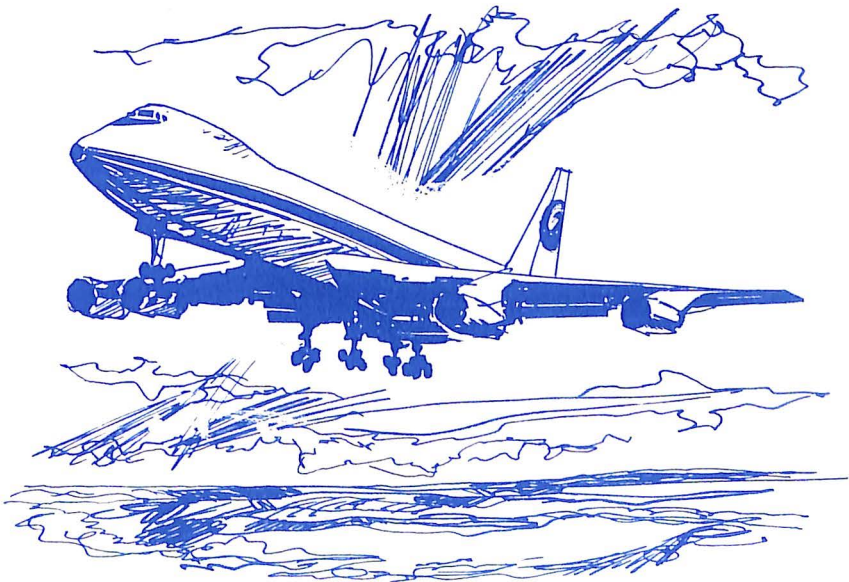
Sources: Aerospace Employment and Payroll: Aerospace Industries Association estimates, based on latest available information; Manufacturing Employment: Bureau of Labor Statistics, "Employment and Earnings" (Monthly); Manufacturing Payroll: Bureau of Economic Analysis.

AEROSPACE SUMMARY

AIRCRAFT IN OPERATION ON WORLD CIVIL AIRLINES, NUMBER AND PERCENTAGE MANUFACTURED IN THE UNITED STATES Calendar Years 1958 to Date

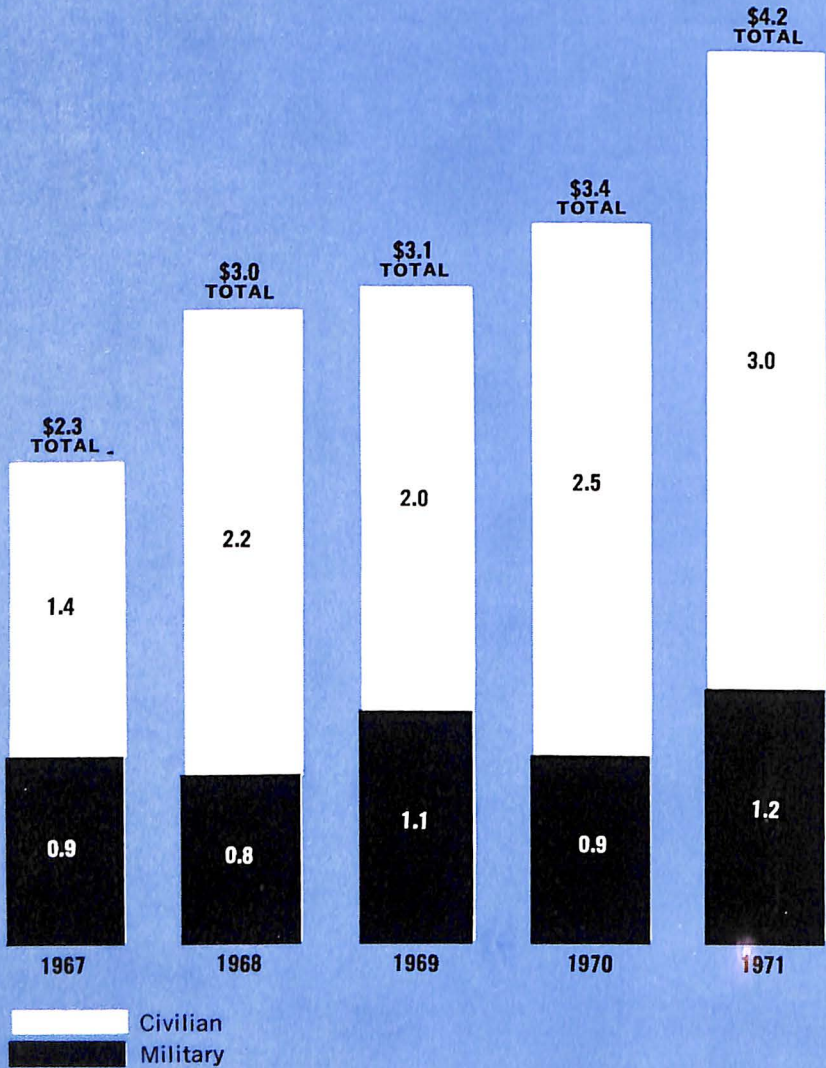
Year Ending December 31	TOTAL AIRCRAFT IN OPERATION	Number Manufactured in the United States	Percent Manufactured in the United States
1958	3,402	2,819	82.9%
1959	3,479	2,868	82.4
1960	3,376	2,766	81.9
1961	3,319	2,542	76.6
1962	3,162	2,345	74.2
1963	3,086	2,266	73.4
1964	3,137	2,317	73.9
1965	3,461	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

NOTE: Based on reports by members of the International Air Transport Association. Excludes U.S.S.R. and People's Republic of China.
Source: International Air Transport Association.



**CIVILIAN AND MILITARY EXPORTS
OF U.S. AEROSPACE PRODUCTS**

(IN BILLIONS OF DOLLARS)



Source: Bureau of the Census

AEROSPACE SUMMARY

U. S. EXPORTS AND EXPORTS OF AEROSPACE PRODUCTS Calendar Years 1912 to Date (Millions of Dollars)

Year Ending December 31	TOTAL Exports of U.S. Merchan- dise	Exports of Aerospace Products					Percent of Total U.S. Exports
		TOTAL	Civil		Military		
			Trans- ports	Other			
1912	\$ 2,170.3	\$ 0.1	N.A.	N.A.	N.A.	a	
1915-18	22,176.7	31.5	N.A.	N.A.	N.A.	0.14	
1922	3,765.1	0.5	N.A.	N.A.	N.A.	a	
1929	5,157.1	9.1	N.A.	N.A.	N.A.	0.18	
1931	2,378.0	4.9	N.A.	N.A.	N.A.	0.2	
1939	3,123.3	117.8	N.A.	N.A.	N.A.	3.8	
1944	14,161.5	2,818.2	N.A.	N.A.	N.A.	19.9	
1948	12,523	154	\$ 37		\$117	1.2	
1950	10,142	242	40		202	2.4	
1951	14,879	301	13		288	2.0	
1952	15,049	603	18		585	4.0	
1954	14,981	619	93		526	4.1	
1957	20,671	1,028	179		849	5.0	
1958	17,745	1,316	147	\$ 456	\$ 713	7.4	
1959	17,451	1,059	108	394	557	6.3	
1960	20,375	1,726	480	609	637	8.5	
1961	20,754	1,653	263	615	773	8.0	
1962	20,431	1,923	259	651	1,013	9.4	
1963	23,062	1,627	191	541	895	7.1	
1964	26,156	1,608	211	553	844	6.1	
1965	27,135	1,618	353	501	764	6.0	
1966	29,884	1,673	421	614	638	5.6	
1967	31,142	2,248	611	769	868	7.2	
1968	34,199	2,994	1,200	1,089	705	8.8	
1969	37,332	3,138	947	1,080	1,111	8.4	
1970	42,659	3,397	1,283	1,227	887	8.0	
1971	43,555	4,196	1,567	1,472	1,157	9.6	

^a Less than 0.005 percent.

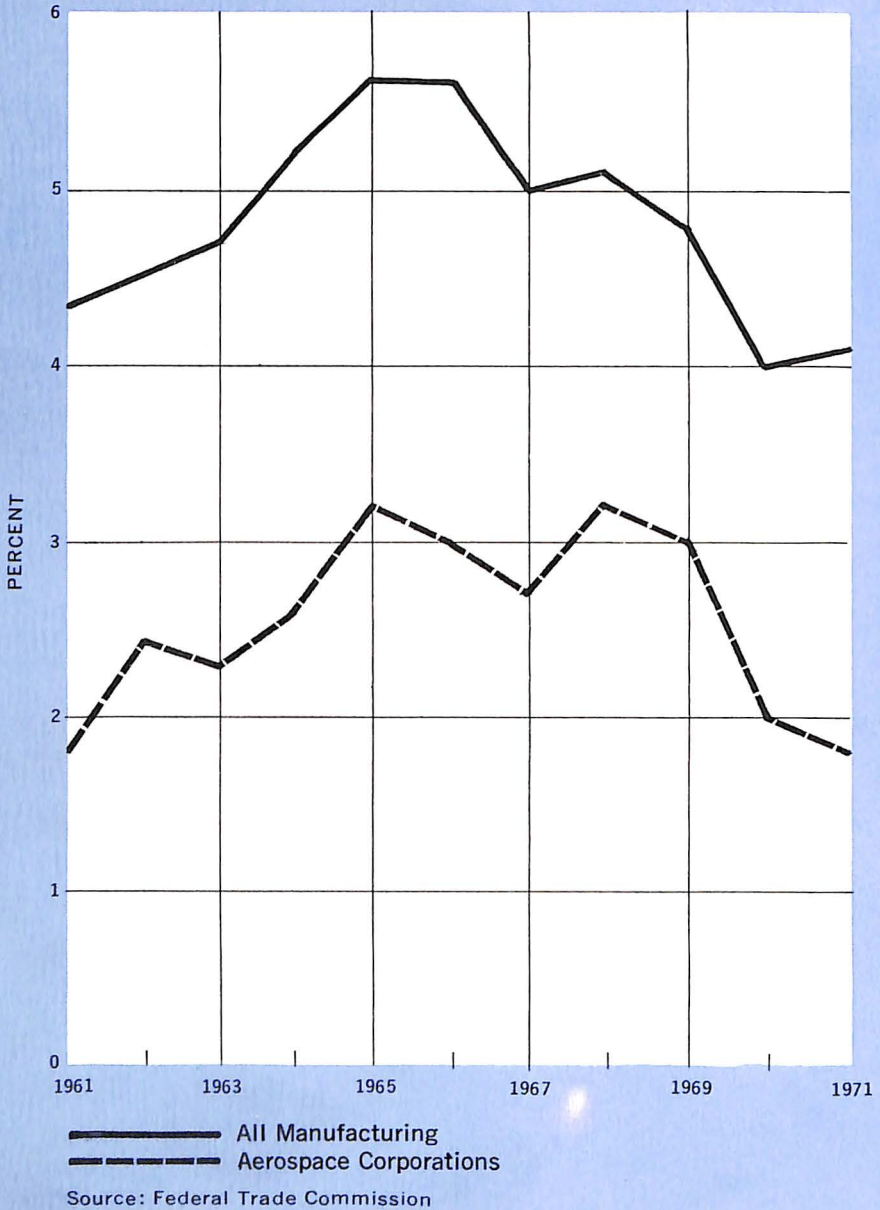
^r Revised.

N.A.—Not available.

NOTE: Several changes have been made in this series over the years so that data for years after 1957 are not strictly comparable with earlier years.

Sources: 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).

NET PROFITS
(AFTER TAXES AS A PERCENTAGE OF SALES)



AEROSPACE SUMMARY

NET PROFIT AFTER TAXES AS A PERCENT OF SALES FOR MANUFACTURING CORPORATIONS Calendar Years 1957 to Date

Year	All Manufacturing Corporations (except Newspapers)	Non- Durable Goods	Durable Goods	Aerospace
1957	4.8%	4.9%	4.8%	2.9%
1958	4.2	4.4	3.9	2.4
1959	4.8	4.9	4.8	1.6
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

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

AEROSPACE FACTS AND FIGURES, 1972/73

ACTIVE MILITARY FORCES OF THE UNITED STATES 1968 and 1971 to Date

Description	Actual		Estimated	
	June 30, 1968	June 30, 1971	June 30, 1972	June 30, 1973
Military personnel (in thousands):				
Army	1,570	1,123	861	841
Navy	765	623	602	602
Marine Corps	307	212	198	198
Air Force	905	755	730	717
TOTAL, Department of Defense . . .	3,547	2,713	2,391	2,358
Selected military forces:				
Strategic forces:				
Intercontinental ballistic missiles:				
Minuteman	20	1,000	1,000	1,000
Titan II	6	54	54	54
Polaris-Poseidon Missiles	656	656	656	656
Strategic bombers (AAI)	1,078	575	512	511
Manned fighter interceptor squadrons	24	11	9	7
Army air defense firing batteries ..	20¼	21	21	21
General purpose forces:				
Army divisions	18	13¾	13	13
Marine Corps divisions	4	3	3	3
Air Force wings	22	21	21	21
Navy attack wings	23	12	12	13
Marine Corps wings	3	3	3	3
Attack & antisubmarine carriers	23	18	17	16
Nuclear attack submarines	33	51	57	60
Escort ships	328	254	226	207
Amphibious assault ships	157	80	77	66
Airlift and Sealift forces:				
Aircraft squadrons:				
C-5A	—	2	4	4
C-133, C-141, C-118, C-124, C-130, C-135	61	15	13	13
Troopships, cargo ships, and tankers	130	93	68	66

Source: Department of Defense, OASD (Comptroller), January 22, 1972.

AEROSPACE SUMMARY

FEDERAL OUTLAYS FOR SELECTED FUNCTIONS AND FOR AEROSPACE PRODUCTS AND SERVICES Fiscal Years, 1948 to Date (Millions of Dollars)

Year Ending June 30	Total National Defense	Total NASA	Federal Outlays for AEROSPACE Products and Services	AEROSPACE as Percent of Total National Defense and NASA
1948	\$11,983	N.A.	\$ 891	7.4%
1949	13,988	N.A.	1,474	10.5
1950	13,009	N.A.	2,130	16.4
1951	22,444	N.A.	2,878	12.8
1952	45,963	N.A.	6,075	13.2
1953	50,442	\$ 79	9,204	18.2
1954	46,986	90	11,194	23.8
1955	40,695	74	10,470	25.7
1956	40,723	71	10,544	25.8
1957	43,368	76	12,506	28.8
1958	44,234	89	13,160	29.7
1959	46,483	145	13,330	28.6
1960	45,691	401	13,269	28.8
1961	47,494	744	13,866	28.7
1962	51,103	1,257	15,295	29.2
1963	52,755	2,552	16,214	29.3
1964	54,181	4,171	17,940	30.7
1965	50,163	5,093	15,697	28.4
1966	57,718	5,933	17,771	27.9
1967	70,095	5,426	20,193	26.7
1968	80,516	4,724	21,353	25.1
1969	81,240	4,251	20,472	23.9
1970	80,295	3,753	18,747	22.3
1971	77,661	3,382	17,335	21.4
1972 ^E	78,030	3,181	17,416	21.4
1973 ^E	78,310	3,192	15,901	19.5

NOTE: "National Defense" includes the military budget of the Department of Defense and Atomic Energy Commission. "Total NASA" includes research and development activities, administrative operations and construction of facilities of NASA. NASA construction is not included in "Total Aerospace Products and Services."

N.A.—Not available.

^E Estimate.

Source: "The Budget of the United States Government" (Annually).

AEROSPACE FACTS AND FIGURES, 1972/73

DEPARTMENT OF DEFENSE TOTAL OUTLAYS BY APPROPRIATION GROUP Fiscal Years, 1965 to Date (Millions of Dollars)

	Year Ending June 30	
	1965	1966
TOTAL	\$47,098	\$55,181
PROCUREMENT	11,839	14,339
AIRCRAFT	5,200	6,635
MISSILES	2,096	2,069
Ships	1,713	1,479
Combat Vehicles, Weapons & Torpedoes	a	a
Ordnance, Vehicles, & Related Equipment	1,041	1,642
Electronics and Communications	897	983
Other procurement	893	1,531
RESEARCH, DEVELOPMENT, TEST AND EVALUATION	6,236	6,259
AIRCRAFT	1,017	76
MISSILES	1,901	1,801
ASTRONAUTICS	921	930
Other	2,397	2,552
MILITARY ASSISTANCE	1,229	968
AIRCRAFT AND MISSILES	358	299
Other	871	669
Military Construction	1,007	1,334
Family Housing	619	647
Civil Defense	93	86
Military Personnel	14,771	16,753
Active Forces	12,662	14,407
Reserve Forces	725	755
Retired Pay	1,384	1,591
Operations and Maintenance	12,349	14,710
Other	(1,045)	85

^E Estimate.

N.A.—Not available.

^a Amount included in entry for "Ordnance, Vehicles & Related Equipment."

^b Aerospace Industries Association estimate based on deliveries of aircraft and missiles to the Air Force and Navy.

NOTE: Data in parentheses are minus figures. While the categories printed in capital letters are primarily "aerospace" categories, others such as "Operations and Maintenance" and "Electronics and Communications" contain substantial parts attributable to aerospace activities. The term "procurement" is used in the federal budget as applying primarily to "major hard goods." Contract procurement actions comprise other procurement programs, such as services, fuels and lubricants, etc.

Sources: Department of Defense.

AEROSPACE SUMMARY

DEPARTMENT OF DEFENSE
 TOTAL OUTLAYS BY APPROPRIATION GROUP—*Continued*
 Fiscal Years, 1965 to Date
 (Millions of Dollars)

Year Ending June 30						
1967	1968	1969	1970	1971	1972 ^e	1973 ^e
\$68,315	\$78,027	\$78,666	\$77,880	\$75,545	\$75,800	\$76,500
19,012	23,283	23,988	21,585	18,858	17,944	16,082
8,411	9,462	9,177	7,948	6,631	6,624	5,141
1,930	2,219	2,509	2,912	3,140	3,283	3,109
1,398	1,356	1,949	2,066	2,114	2,113	2,213
^a	738	^a	647	545	447	439
3,881	5,709	6,590	4,973	3,586	3,114	2,554
1,284	1,595	1,409	1,182	1,163	961	860
2,108	2,204	2,354	1,857	1,679	1,402	1,766
7,160	7,747	7,459	7,166	7,303	7,780	7,923
1,048	1,367	1,031	1,239	1,699	1,964	1,767
2,502	2,488	2,410	2,196	2,008	1,971	2,267
983	1,221	1,159	753	519	436	485
2,627	2,671	2,859	2,978	3,077	3,409	3,404
873	601	686	609	999	800	600
182 ^b	97 ^b	57 ^b	68	102	70	148
691	504	629	541	897	730	452
1,536	1,281	1,389	1,168	1,095	1,397	1,203
482	495	572	614	598	726	800
100	108	87	80	75	80	85
19,787	21,954	23,828	25,880	26,018	26,528	26,626
17,055	18,988	20,478	21,977	21,428	21,113	20,657
902	871	907	1,054	1,204	1,487	1,643
1,830	2,095	2,443	2,849	3,386	3,928	4,326
19,000	20,578	22,285	21,609	20,941	20,500	20,450
365	1,980	(1,628)	(831)	(342)	45	2,731

AEROSPACE FACTS AND FIGURES, 1972/73

DEPARTMENT OF DEFENSE
AEROSPACE EXPENDITURES
Fiscal Years 1960 to Date
(Millions of Dollars)

Year Ending June 30	DOD Aerospace Expenditures	Procurement		Research, Development, Test, and Evaluation
		Military Functions	Military Assistance ^a	
1960	\$13,013	\$ 9,299	\$511	\$3,203
1961	13,379	8,870	419	4,090
1962	14,359	9,842	367	4,150
1963	14,302	10,126	445	3,731
1964	14,423	9,630	218	4,575
1965	11,493	7,296	358	3,839
1966	12,710	8,704	299	3,707
1967	15,056	10,341	182	4,533
1968	16,854	11,681	97	5,076
1969	16,333	11,686	57	4,600
1970	15,116	10,860	68	4,188
1971	14,099	9,771	102	4,226
1972 ^E	14,348	9,907	70	4,371
1973 ^E	12,917	8,250	148	4,519

^E Estimate.

^a Data on Military Assistance are based on deliveries of aircraft and missiles to Air Force and Navy, or on Budget Plan data. These data are not included in most other tables on Department of Defense expenditures in this book.

Sources: Department of Defense, "FAD" Reports; Department of Defense, "Military Assistance Facts" (Annually); "The Budget of the United States Government" (Annually).

AEROSPACE SUMMARY



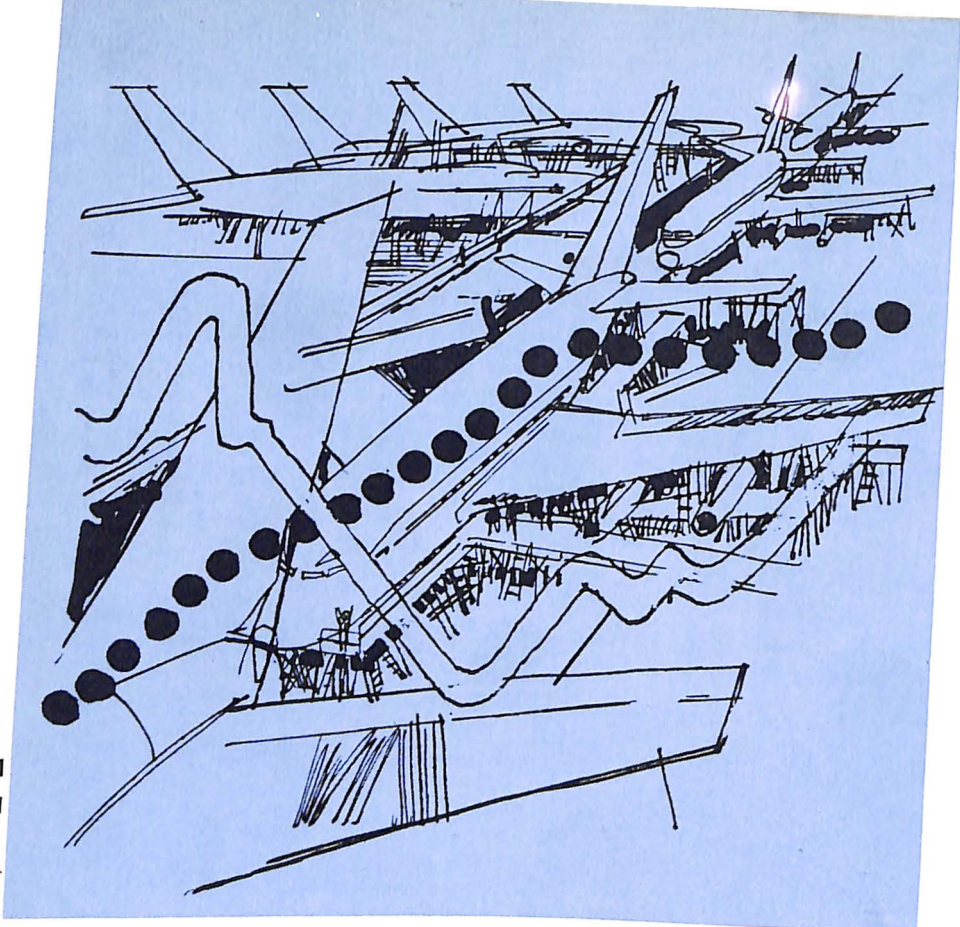
NEW OBLIGATIONAL AUTHORITY FOR AEROSPACE PRODUCTS AND SERVICES FISCAL YEARS 1962 TO DATE (Millions of Dollars)

Year Ending June 30	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 ^E	17,617	14,321	8,552	5,364	405	3,296
1973 ^E	17,730	14,351	7,797	6,100	454	3,379

^E Estimate.

NOTE: Excludes transfers from stock funds beginning with 1969.

Source: Department of Defense, Press Package, January 24, 1972, Reports FAD-647, 648, February 2, 1970 and earlier reports. NASA, "The Budget of the United States Government" (Annually).



Aircraft Production

In 1971, production of aircraft in the United States declined for the third year in succession. An estimated 9,548 airplanes were turned out, compared with 10,558 in 1970. The 9.6 percent dropoff was, however, substantially less than the more than 37 percent decline experienced between 1969 and 1970.

Commercial air transport output fell sharply—from 311 units in 1970 to 223 in 1971.

General aviation rose slightly, from 7,283 to 7,466 units produced.

Production of commercial helicopters, which had dropped 10 percent between 1969 and 1970, remained almost steady, slipping only 3 percent, from 482 in 1970 to 469 in 1971. As was the case in 1970, no figures were available on 1971 production of military helicopters.

Combined aircraft sales, which had climbed slightly in 1970 to \$13.5 billion, declined to \$11.3 billion in 1971. Aircraft sales to the U.S. govern-

ment dropped more than \$1.3 billion, and other sales (mostly civil) by over \$800 million.

Backlog of total aircraft orders continued to decline from a high of \$20.6 billion in 1967 to \$11.8 billion as of December 31, 1971.

U. S. AIRCRAFT PRODUCTION
Calendar Years 1909 to Date
(Number of Aircraft)

Year Ending December 31	TOTAL	Military	Civil
1909	N.A.	1	N.A.
1910	N.A.	—	N.A.
1911	N.A.	11	N.A.
1912	45	16	29
1913	43	14	29
1914	49	15	34
1915	178	26	152
1916	411	142	269
1917	2,148	2,013	135
1918	14,020	13,991	29
1919	780	682	98
1920	328	256	72
1921	437	389	48
1922	263	226	37
1923	743	687	56
1924	377	317	60
1925	789	447	342
1926	1,186	532	654
1927	1,995	621	1,374
1928	4,346	1,219	3,127
1929	6,193	677	5,516
1930	3,437	747	2,690
1931	2,800	812	1,988
1932	1,396	593	803
1933	1,324	466	858
1934	1,615	437	1,178
1935	1,710	459	1,251
1936	3,010	1,141	1,869
1937	3,773	949	2,824
1938	3,623	1,800	1,823
1939	5,856	2,195	3,661
1940	12,813	6,028	6,785
1941	26,289	19,445	6,844
1942	47,675	47,675	—
1943	85,433	85,433	—

(Continued on next page)

AEROSPACE FACTS AND FIGURES, 1972/73

AIRCRAFT PRODUCTION
1909 TO DATE (cont'd)
(Number of Aircraft)

Year Ending December 31	TOTAL	Military	Civil
1944	95,272	95,272	—
1945	48,912	46,865	2,047
1946	36,418	1,417	35,001
1947	17,739	2,122	15,617
1948	9,838	2,536	7,302
1949	6,137	2,592	3,545
1950	6,200	2,680	3,520
1951	7,532	5,055	2,477
1952	10,640	7,131	3,509
1953	13,112	8,978	4,134
1954	11,478	8,089	3,389
1955	11,484	6,664	4,820
1956	12,408	5,203	7,205
1957	11,943	5,198	6,745
1958	10,938	4,078	6,860
1959	11,076	2,834	8,242
1960	10,237	2,056	8,181
1961	9,054	1,582	7,472
1962	9,308	1,975	7,333
1963	10,125	1,970	8,155
1964	12,492	2,439	10,053
1965	15,349	2,806	12,543
1966	19,886	3,609	16,277
1967	19,141	4,481	14,660
1968	19,416	4,440	14,976
1969	16,841	3,644	13,197
1970 ^E	10,558 ^E	2,700 ^E	7,858
1971 ^E	9,548 ^E	1,900 ^E	7,648

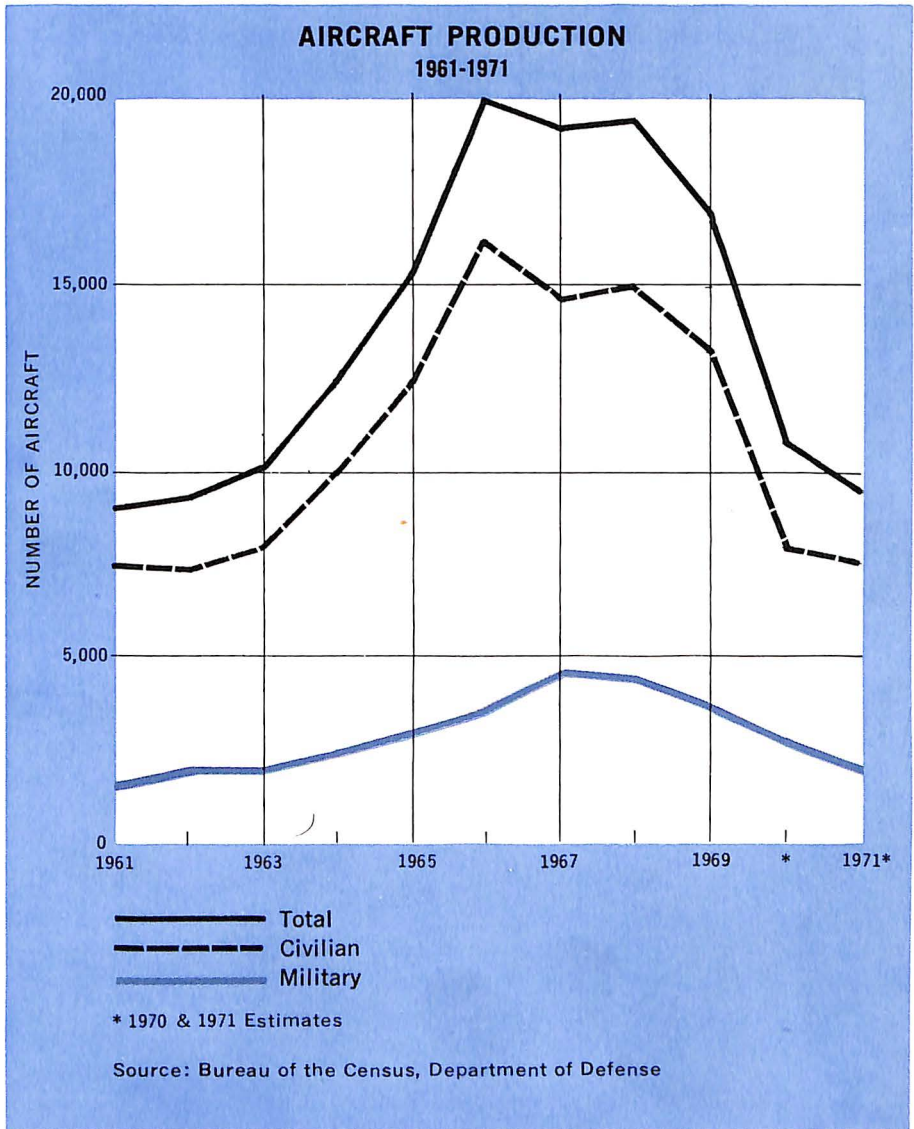
NOTE: 1950 to date excludes aircraft produced for the Military Assistance Program.

^E Estimate.

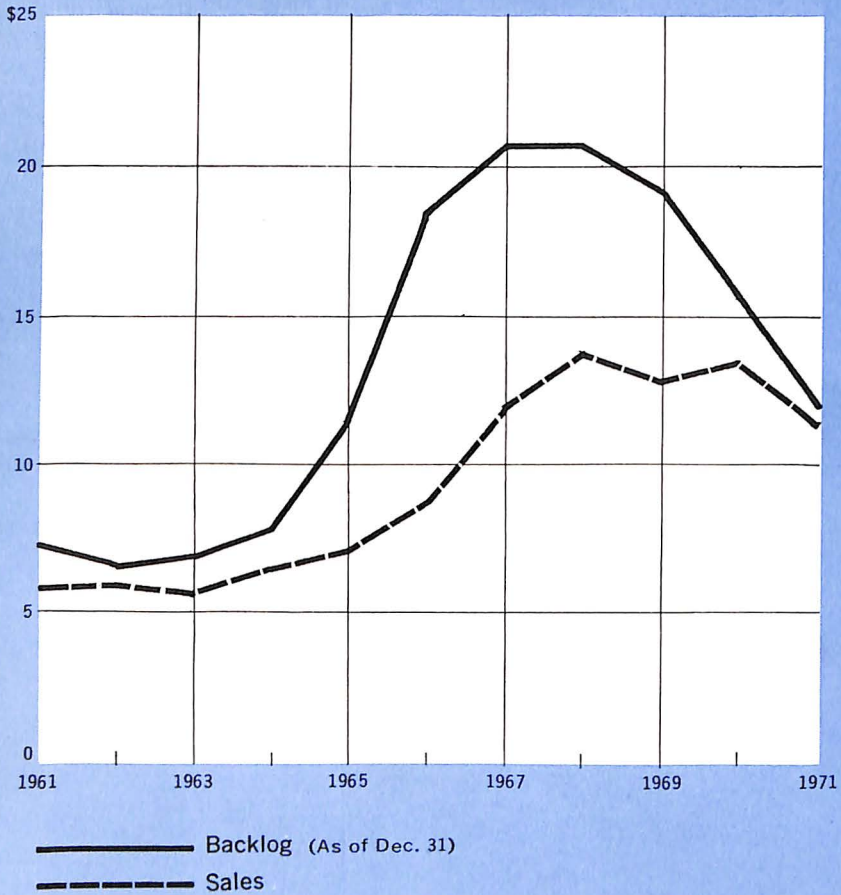
N.A.—Not available.

Sources: Department of Commerce, Bureau of the Census, "Current Industrial Reports, Series M37G" (Monthly). Department of Defense.

AIRCRAFT PRODUCTION



AIRCRAFT SALES AND BACKLOG (IN BILLIONS OF DOLLARS)



Source: Bureau of the Census

AIRCRAFT PRODUCTION

AIRCRAFT SALES AND BACKLOG, REPORTED BY MAJOR MANUFACTURERS OF
COMPLETE AIRCRAFT, AIRCRAFT ENGINES, PROPELLERS, AND PARTS
Calendar Years 1948 to Date
(Millions of Dollars)

Year Ending December 31	Aircraft, Aircraft Engines, Propellers, and Parts	
	Net Sales During Year	Backlog December 31
1948	\$ 1,061 ^a	\$ 2,983
1949	1,668	2,853
1950	2,116	4,717
1951	2,872	11,898
1952	5,654	16,692
1953	7,754	15,928
1954	7,471	13,755
1955	7,231	13,864
1956	7,689	16,000
1957	9,482	12,363
1958	8,661	10,182
1959	7,206	8,121
1960	6,527	7,736
1961	5,842	7,192
1962	5,898	6,572
1963	5,613	6,811
1964	6,428	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 ^r	13,466	15,713
1971	11,287	11,833

^r Revised.

^a Three quarters only.

NOTE: 1948 to 1960 based on reports from about 48 companies—all companies known to be engaged in the manufacture of complete aircraft, aircraft engines, and aircraft propellers. After 1960, based on reports from about 55 aerospace companies.

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).

AEROSPACE FACTS AND FIGURES, 1972/73

AIRCRAFT SALES BY MAJOR MANUFACTURERS OF COMPLETE AIRCRAFT, AIRCRAFT ENGINES, AND PARTS Calendar Years 1948 to Date (Millions of Dollars)

Year End- ing Dec. 31	Total			Aircraft & Parts ^a		Aircraft Engines & Parts	
	TOTAL	U.S. Gov't	Other	U.S. Gov't	Other	U.S. Gov't	Other
1948 ^b	\$ 1,061	\$ 884	\$ 177	\$ 662	\$ 134	\$ 222	\$ 43
1949	1,668	1,438	230	977	183	461	47
1950	2,116	1,878	238	1,317	174	561	64
1951	2,872	2,525	347	1,746	247	779	100
1952	5,654	5,004	650	3,564	481	1,440	169
1953	7,760	7,026	734	4,837	545	2,189	189
1954	7,471	6,649	822	4,777	632	1,872	190
1955	7,231	6,445	786	4,717	581	1,728	205
1956	7,689	6,523	1,166	4,805	849	1,718	317
1957	9,482	7,884	1,598	5,747	1,208	2,137	390
1958	8,661	7,289	1,372	5,431	1,051	1,858	321
1959	7,236	5,395	1,841	4,127	1,433	1,268	408
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 ^c	13,466	7,586	5,880	5,674	4,683	1,912	1,197
1971	11,287	6,212	5,075	4,868	4,091	1,344	984

^a Includes Aircraft Propellers and Parts.

^b Total for the last 3 quarters of 1948 only.

^c Revised.

NOTE: 1948 to 1960 based on reports from about 48 companies—all companies known to be engaged in the manufacture of complete aircraft, aircraft engines, and aircraft propellers. After 1960, based on reports from about 55 aerospace companies. Includes some duplication because of subcontracting between aerospace companies.

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).

AIRCRAFT PRODUCTION

AIRCRAFT BACKLOG OF ORDERS REPORTED BY MAJOR MANUFACTURERS OF COMPLETE
AIRCRAFT, AIRCRAFT ENGINES AND PARTS
1948 to Date
(Millions of Dollars)

Year Ending Dec. 31	Total			Aircraft & Parts ^a		Aircraft Engines & Parts	
	TOTAL	U.S. Government	Other	U.S. Government	Other	U.S. Government	Other
1948	\$ 2,983	\$ 2,817	\$ 166	\$ 2,058	\$ 139	\$ 759	\$ 27
1949	2,853	2,708	145	1,998	106	710	39
1950	4,717	4,287	430	2,888	359	1,399	71
1951	11,898	10,899	999	7,549	818	3,350	181
1952	16,692	15,626	1,066	10,634	886	4,992	180
1953	15,928	14,984	944	11,031	791	3,953	153
1954	13,755	12,835	920	10,029	797	2,806	123
1955	13,864	11,553	2,311	8,823	1,980	2,730	331
1956	16,000	12,299	3,701	8,983	2,952	3,316	749
1957	12,363	8,942	3,421	6,563	2,831	2,379	590
1958	10,182	6,933	3,249	5,454	2,710	1,479	539
1959	8,121	5,476	2,645	4,479	2,225	997	420
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		7,071	9,306	4,251	
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 ^r	15,713	5,913	9,800	4,663	8,601	1,250	1,199
1971	11,833	5,821	6,012	4,469	5,092	1,352	920

NOTE: 1948 to 1960 based on reports from about 48 companies—all companies known to be engaged in the manufacture of complete aircraft, aircraft engines, and aircraft propellers. After 1960, based on reports from about 55 aerospace companies.

^a Including "Aircraft Propellers and Parts."

^r Revised.

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).

AEROSPACE FACTS AND FIGURES, 1972/73

NUMBER OF MILITARY AIRCRAFT, MISSILES, AND OTHER ITEMS PROGRAMMED
1971, 1972, AND 1973 BY SERVICE

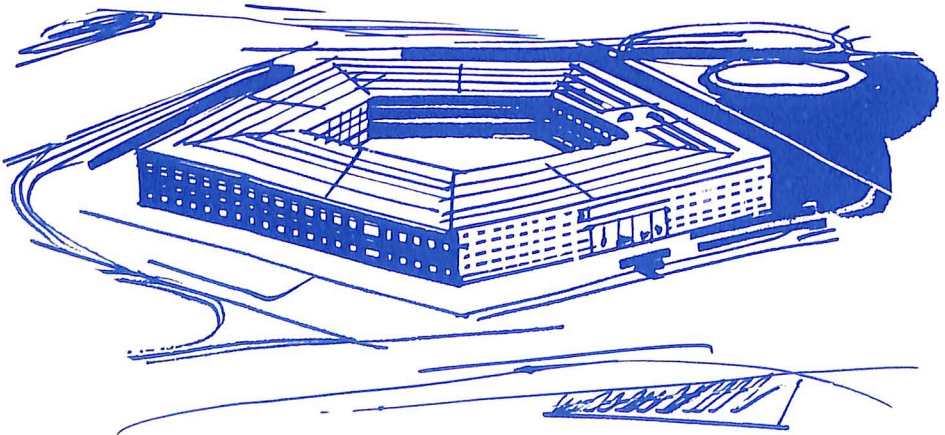
Major Item	Year Ending June 30		
	1971 ^r	1972 ^E	1973 ^E
AIRCRAFT—Total.....	1,694	876	559
Air Force.....	624	205 ^a	251
Navy and Marine Corps.....	268	271	282
Army.....	802	400	26
Helicopters.....	1,129	442	176
Fixed Wing Aircraft.....	565	434	383
MISSILES—Total.....	22,466	18,841	23,934
Air Force.....	521	2,885	4,108
Navy and Marine Corps.....	3,141	2,433	2,151
Army.....	18,804	13,523	17,675
SHIPS—Navy—Total.....	25	24	29
New Construction.....	15	16	20
Conversions.....	10	8	9
TRACKED COMBAT VEHICLES—TOTAL.....	2,098	618	552
Army.....	1,800	150	198
Marine Corps.....	298	468	354

^a Includes FY 1972 proposed supplemental procurement.

^r Revised.

^E Estimated.

Source: Department of Defense, OASD, Comptroller, January 26, 1972.



AIRCRAFT PRODUCTION

DEPARTMENT OF DEFENSE
 OUTLAYS FOR AIRCRAFT PROCUREMENT, BY AGENCY
 Fiscal Years 1951 to Date
 (Millions of Dollars)

Year Ending June 30	Total Defense Department	Air Force	Navy	Army
1951	\$2,412	\$1,812	\$ 594	\$ 7
1952	4,888	3,633	1,205	51
1953	8,189	N.A.	N.A.	N.A.
1954	9,080	N.A.	N.A.	N.A.
1955	8,804	N.A.	N.A.	N.A.
1956	7,835	N.A.	N.A.	N.A.
1957	8,647	N.A.	N.A.	N.A.
1958	8,793	N.A.	N.A.	N.A.
1959	7,730	N.A.	N.A.	N.A.
1960	6,272	4,414	1,765	93
1961	5,898	3,926	1,832	141
1962	6,659	4,387	2,102	170
1963	6,309	3,746	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 ^E	6,624	3,793	2,528	303
1973 ^E	5,141	2,325	2,646	170

N.A.—Not available.

^E Estimate.

Source: Department of Defense, OASD (Comptroller), FAD-719, February 3, 1972 and earlier reports.

AEROSPACE FACTS AND FIGURES, 1972/73

MILITARY AIRCRAFT PRODUCED: NUMBER, FLYAWAY VALUE,
AND AIRFRAME WEIGHT
Calendar Years 1955 to Date

Year Ending December 31	TYPE OF AIRCRAFT						
	TOTAL	Bomber	Fighter/ Attack	Trans- port	Trainer	Heli- copter	Other
<i>NUMBER</i>							
1955	6,664	1,353	3,128	513	1,111	410	149
1956	5,203	1,164	1,916	362	778	644	339
1957	5,198	873	2,073	224	819	659	550
1958	4,078	676	1,482	271	560	641	448
1959	2,834	511	922	215	564	451	171
1960	2,056	471	595	142	268	488	92
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 ^d	4,440	34	1,007	18	292	2,800	289
1969 ^d	3,644	31	792	44	295	2,165	317
<i>FLYAWAY VALUE^a (Millions of Dollars)</i>							
1955	\$4,927.9	\$2,013.8	\$1,907.4	\$652.7	\$166.4	\$169.2	\$18.4
1956	5,075.3	2,202.9	1,987.4	537.0	115.5	184.6	47.9
1957	5,284.9	2,163.4	2,086.5	676.2	169.5	156.6	32.7
1958	5,365.3	2,157.2	2,106.6	781.9	139.4	156.0	24.2
1959	5,101.0	2,066.1	1,829.5	759.4	216.1	163.1	66.8
1960	3,384.4	1,560.7	1,109.1	415.5	130.0	172.9	50.2
1961	4,497.4	2,570.0	1,054.6	385.2	199.7	228.2	54.7
1962	3,816.1	1,629.5	1,005.2	674.3	193.7	249.6	63.8
1963	2,876.1	798.3	931.0	587.2	181.5	337.3	40.8
1964	3,080.2	801.7	1,156.6	623.6	121.5	356.1	20.7
1965	2,875.1	638.8	960.2	655.2	108.0	490.1	22.8
1966	3,554.3	611.7	1,289.6	701.3	190.0	748.7	13.0
1967	4,476.1	822.2	1,720.9	758.9	143.9	961.8	68.4
1968 ^d	3,870.6	116.7	2,450.7	81.4	166.9	905.3	149.6
1969 ^d	3,693.4	248.4	2,204.1	100.6	164.1	845.3	130.9

(Continued on next page)

AIRCRAFT PRODUCTION

MILITARY AIRCRAFT PRODUCED: NUMBER, FLYAWAY VALUE, AND AIRFRAME WEIGHT—*Continued* Calendar Years 1955 to Date

Year Ending December 31	TYPE OF AIRCRAFT						
	TOTAL	Bomber	Fighter/ Attack	Trans- port	Trainer	Heli- copter	Other
<i>AIRFRAME WEIGHT^c (Millions of Pounds)</i>							
1955	114.3	39.9	43.2	20.9	7.4	b	2.9
1956	90.0	38.6	30.6	13.1	3.3	b	4.4
1957	79.4	32.7	28.7	9.3	4.2	b	4.5
1958	66.1	25.2	18.0	15.9	3.1	b	3.9
1959	51.8	18.6	12.9	14.6	3.5	b	2.2
1960	35.8	13.6	9.1	9.7	1.1	b	2.3
1961	29.6	11.9	6.1	8.3	0.9	b	2.4
1962	35.6	10.3	7.4	13.2	1.3	b	3.4
1963	32.1	4.1	8.2	14.5	1.3	b	4.0
1964	38.7	5.6	12.4	15.1	1.1	b	4.5
1965	33.9	4.7	10.7	10.8	1.4	b	6.3
1966	44.1	4.4	12.6	14.0	1.8	b	11.3
1967	41.3	4.2	11.7	13.0	1.9	b	10.5
1968 ^d	39.4	1.8	20.9	3.0	1.6	b	12.1
1969 ^d	29.2	1.3	12.7	3.5	1.5	b	10.2

NOTE: Data exclude gliders and targets.

^a Values up to 1961, are based on unit prices in latest production contracts and do not include values of spares, spare parts, and other support equipment. Since 1961, data include spares, spare parts, and support equipment that are procured with the basic aircraft.

^b Airframe weight of helicopter is included in the "other" category.

^c Airframe weight includes aircraft produced for Military Assistance and other federal agencies.

^d 1955-1967, Navy attack planes included with Bombers. 1968 & 1969, Navy attack planes included under Fighter/Attack.

Source: Department of Defense. Data released with a two-year lag for security reasons.

AEROSPACE FACTS AND FIGURES, 1972/73

FLYAWAY AND WEAPON SYSTEM COST OF MILITARY AIRCRAFT PRODUCED
(By Department, Type and Model)
Calendar Year 1969
(Dollar Figures in Millions)

Department, Type and Model	Number	Flyaway Cost ^a	Weapon System Cost ^b
DEPARTMENT OF DEFENSE ^c —Total . . .	3,644	\$3,693	\$4,052
AIR FORCE—Total	1,041	1,622	1,800
Bomber (FB-111)	7	56	88
Fighter/Attack	499	1,288	1,422
A-7	12	56	92
A-37	133	50	52
F-4	204	479	485
RF-4	63	151	161
F-111	87	552	632
Transports	44	101	101
C-5	5	N.A.	N.A.
C-9	5	18	18
C-130	34	82	83
Trainers	198	87	90
T-37	77	14	15
T-38	117	73	75
T-41	4	^d	^d
Helicopters	47	41	46
UH-1	36	11	12
HH-53	11	30	34
Utility & Observation	246	49	53
O-2	174	16	19
OV-10	63	33	34
U-17	9	^d	^d
ARMY—Total	1,975	623	627
Helicopters	1,918	548	552
AH-1	299	139	139
UH-1	1,006	258	258
OH-6	368	35	35
CH-47	54	77	80
CH-54	12	25	26
TH-55	84	3	3
OH-58	95	11	11
Utility & Observation	57	75	75
OV-1	42	70	70
U-21	15	5	5

(Continued on next page)

AIRCRAFT PRODUCTION

FLYAWAY AND WEAPON SYSTEM COST OF MILITARY AIRCRAFT PRODUCED—Continued
 (By Department, Type and Model)
 Calendar Year 1969
 (Dollar Figures in Millions)

Department, Type and Model	Number	Flyaway Cost ^a	Weapon System Cost ^b
Navy—Total.....	628	\$1,448	\$1,625
Patrol (P-3).....	24	192	208
Attack.....	217	691	791
A-6.....	70	235	271
EA-6.....	17	103	127
A-7.....	115	255	293
RA-5.....	15	98	100
Fighters.....	76	225	256
F-4.....	75	198	223
F-111.....	1	27	33
Trainers.....	97	77	82
T-2.....	48	30	32
T-38.....	2	2	2
TA-4.....	47	45	48
Utility (OV-10).....	14	7	9
Helicopters.....	200	256	279
AH-1.....	39	29	32
UH-1.....	8	3	4
TH-1.....	9	4	4
CH-46.....	90	132	139
CH-53.....	54	88	100

N.A.—Not available.

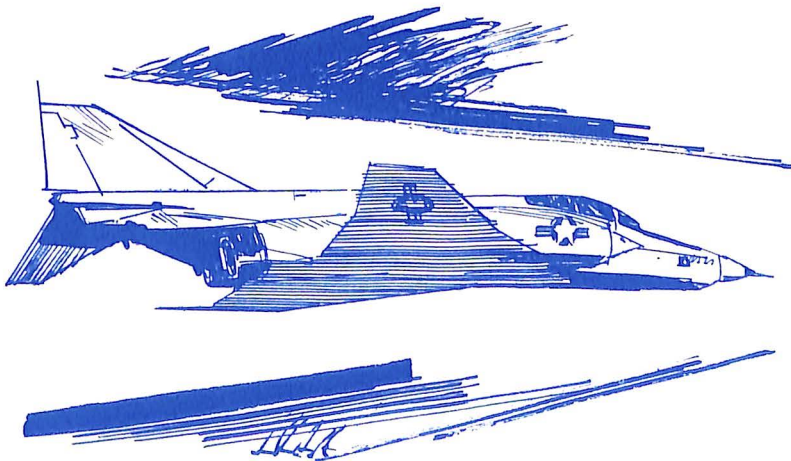
^a Flyaway Cost includes airframe, engines, electronics, communications, armament and other installed equipment.

^b Weapon System Cost includes flyaway items, initial spares, and ground equipment and training equipment.

^c Data exclude aircraft produced for Military Assistance and U.S. Coast Guard.

^d Less than \$500,000.

Source: Department of Defense. Data released with a two-year lag for security reasons.

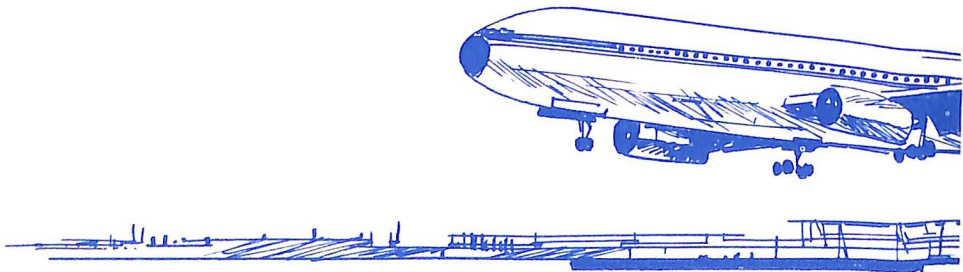


AEROSPACE FACTS AND FIGURES, 1972/73

PRODUCTION OF COMMERCIAL^a TRANSPORT AIRCRAFT 1965 to Date (Fixed Wing, Multiple Engine)

Company and Aircraft	1965	1966	1967	1968	1969	1970	1971
Total	233	344	480	702	514	311	223
Boeing							
707.....	54	77	113	111	59	19	10
720.....	9	6	5	—	—	—	—
727.....	112	135	115	160	115	54	33
737.....	—	—	4	105	114	37	29
747.....	—	—	—	—	4	92	69
Fairchild							
F-27.....	12	3	3	—	2	—	—
FH-227.....	—	27	35	6	—	—	—
Lockheed							
130.....	10	11	9	25	13	25	13
McDonnell Douglas							
DC-8.....	31	16	41	102	85	33	13
DC-9.....	5	69	155	193	122	51	43
DC-10.....	—	—	—	—	—	—	13

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



AIRCRAFT PRODUCTION

TOTAL ORDERS FOR JET TRANSPORTS
(Domestic and Foreign)
As of December 31, 1971

	TOTAL Aircraft for Delivery in 1972 or Later	Domestic Orders	Foreign Orders
<u>Transports</u>			
Number of aircraft	565	278	287
Value—million dollars ^a	\$7,773	\$4,219	\$3,554
<u>Number of Transport Aircraft</u>			
<u>Boeing</u>			
B-707	2	0	2
B-727	42	12	30
B-737	17	1	16
B-747	41	8	33
<u>Lockheed</u>			
L-1011	149	128	21
L-100-30	56	0	56
<u>McDonnell Douglas</u>			
DC-8	4	0	4
DC-9	25	0	25
DC-10	229	129	100

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



SHIPMENTS OF GENERAL AVIATION AIRCRAFT
BY SELECTED MANUFACTURERS

Calendar Years 1947 to Date

Year Ending Decem- ber 31	TOTAL	Beech	Cessna	Gates Learjet	Grum- man	North Amer- ican Rock- well ^a	Piper	Other
NUMBER OF AIRCRAFT SHIPPED								
1947	15,594	1,288	2,390	—	—	—	3,634	8,282
1948	7,037	746	1,631	—	—	—	1,479	3,181
1950	3,386	489	1,134	—	—	—	1,108	655
1952	3,058	414	1,373	—	—	39	1,161	71
1954	3,071	579	1,200	—	—	67	1,191	34
1956	6,738	724	3,235	—	—	154	2,329	296
1958	6,414	694	2,926	—	—	97	2,162	535
1960	7,588	962	3,720	—	—	155	2,313	438
1962	6,723	830	3,124	—	—	121	2,139	509
1964	9,371	1,103	4,188	3	—	109	3,196	772
1966	15,747	1,535	7,888	51	70	354	4,437	1,412
1968	13,698	1,347	6,578	41	N.A.	471	4,228	1,033
1970	7,283	793	3,780	35	15 ^c	211	1,675	774
1971	7,466	519	3,859	23	116	202	2,055	692
MANUFACTURER'S NET BILLING PRICE (Millions of Dollars)								
1947	\$ 57.9	\$ 13.4	\$ 6.0	\$ —	\$ —	\$ —	\$ 7.7	\$30.8
1948	32.5	10.1	6.7	—	—	—	3.1	12.6
1950	19.2	6.5	5.5	—	—	—	3.1	4.1
1952	26.2	9.9	9.2	—	—	2.0	4.9	0.2
1954	43.5	20.1	10.7	—	—	4.5	8.1	0.1
1956	103.8	28.8	38.6	—	—	11.2	23.5	1.7
1958	101.9	27.1	36.9	—	—	6.9	26.5	4.5
1960	151.2	43.0	56.7	—	—	11.9	35.1	4.5
1962	136.8	37.4	50.2	—	—	10.8	32.1	6.3
1964	198.9	54.9	66.8	N.A.	—	12.0	54.5	10.7
1966	444.2 ^r	97.3	128.2	28.6	N.A.	51.5	80.1	58.5
1968	421.5	115.7	138.8	28.7	N.A.	22.3	85.5	30.5
1970	336.9	80.6	97.4	26.8	40.6	20.0	48.5	23.0
1971	321.5	52.1	102.4	18.1	42.7	24.7	56.7	24.8

^r Revised.

N.A.—Not available.

^a Includes production of Aero Commanders and Sabreliners. Value figures are for Aero Commander only.

^b Aero Commander only.

^c Gulfstream only.

Source: 1947-1969: Aerospace Industries Association, company reports. 1970 & 1971: General Aviation Manufacturers Association, company reports.

AIRCRAFT PRODUCTION

PRODUCTION OF COMMERCIAL HELICOPTERS (Number of Helicopters) Calendar Years 1964 to Date

Company and Helicopter	1964	1965	1966	1967	1968	1969	1970	1971
TOTAL	579	598	583^a	455^{ab}	522^{ab}	534^{ab}	482^{ab}	469^b
Bell								
U.S. production								
47 series.....	118	134	183	171	151	134	124	110
204 series.....	8	16	20	20	—	—	—	1
205 series.....	—	—	—	12	29	49	23	13
206 series.....	—	—	—	113	184	156	138	129
212 series.....	—	—	—	—	—	—	3	21
Foreign licensees								
47 series.....	103	123	147	N.A.	N.A.	N.A.	N.A.	N.A.
204 series.....	48	48	46	N.A.	N.A.	N.A.	N.A.	N.A.
102 series.....	—	—	—	N.A.	N.A.	N.A.	N.A.	N.A.
Boeing-Vertol U.S.								
production								
CH-47C.....	—	—	—	—	—	—	—	5
BV-107.....	16	13	13	—	—	—	—	—
Foreign licensees								
BV-107.....	3	1	1	—	—	—	—	—
Enstrom								
F-28.....	—	—	4	7	—	—	—	—
F-28A.....	—	—	—	—	13	25	—	17
Fairchild Industries								
12 series.....	34	73	29	9	4	2	—	—
FH-1100.....	—	—	8	44	60	40	37	21
Hughes								
200's.....	46	23	—	—	—	—	—	—
300's.....	121	81	62	48	57	43	74	54
500's.....	—	—	—	—	15	65	75	83
Kaman								
HH-43B.....	11	10	1	—	—	—	—	—
HH-43F.....	—	—	5	—	—	—	—	—
Sikorsky U.S. and								
foreign production								
S-61.....	18	31	18	10	6	13	6	9
S-62.....	5	1	9	4	3	7	—	—
S-65.....	—	—	—	—	—	—	2	6

N.A.—Not available.

^a Excludes 3 Fairchild "Porters" in 1966; 9 in 1967; 5 in 1968; 13 in 1969; 1 in 1970.

^b Excludes foreign licensees of Bell.

Source: Aerospace Industries Association, company reports.

AEROSPACE FACTS AND FIGURES, 1972/73

PRODUCTION OF HELICOPTERS
TOTAL, COMMERCIAL AND MILITARY
Calendar Years 1954 to Date

Year	TOTAL	Commer- cial	Military ^a			
			Total	Air Force	Navy	Army
1954	562	131	431	172	46	155
1955	590	146	444	82	128	200
1956	915	268	647	62	152	430
1957	1,003	314	689	16	193	450
1958	908	240	668	2	204	435
1959	704	253	451	28	101	322
1960	760	266	494	57	147	284
1961	744	378	366	42	187	137
1962	1,031	407	624	33	208	313
1963	1,266	504	762	45	165	462
1964	1,678	579	1,099	34	145	828
1965	2,086	598	1,488	60	195	1,215
1966	2,825	583	2,242	80	253	1,831
1967	2,903	455 ^b	2,448	73	279	2,096
1968	3,322	522 ^b	2,800	37	198	2,565
1969	2,699	534 ^b	2,165	47	200	1,918
1970	N.A.	482 ^b	N.A.	N.A.	N.A.	N.A.
1971	N.A.	469 ^b	N.A.	N.A.	N.A.	N.A.

^a Prior to 1959 the total includes helicopters bought by the Department of Defense under the Military Assistance Program and for other federal agencies.

^b Excludes foreign licensees of Bell.

N.A.—Not available.

Sources: Aerospace Industries Association, company reports. Department of Defense.

AIRCRAFT ENGINE PRODUCTION, CALENDAR YEARS 1917 TO DATE
(Number of Engines)

Year Ending December 31	TOTAL	Military		Civil	
		Recipr.	Jet	Recipr.	Jet
1917-1919	N.A.		44,453		N.A.
1928	3,252		2,620		632
1929	7,378		1,861		5,517
1930	3,766		1,841		1,925
1935	2,965		991		1,974
1940	30,167 ^E		22,667		7,500 ^E
1941	64,681 ^E		58,181		6,500 ^E
1942	138,089		138,089		—
1943	227,116		227,116		—
		Recipr.	Jet	Recipr.	Jet
1944	256,911	256,789	122	—	—
1945	111,650 ^E	108,442	1,208	2,000 ^E	—
1946	43,407	1,680	905	40,822	—
1947	20,912	2,683	1,878	16,351	—
1948	14,027	2,495	2,493	9,039	—
1949	11,972	2,981	5,009	3,982	—
1950	13,675	3,122	6,239	4,314	—
1951	20,867	6,471	9,816	4,580	—
1952	31,041	8,731	16,928	5,382	—
1953	40,263	13,365	20,251	6,647	—
1954	26,959	7,868	13,572	5,519	—
1955	21,108	3,875	9,594	7,639	—
1956	21,348	2,663	7,186	11,499	—
1957	21,946	2,429	8,658	10,859	38
1958	18,354	1,452	6,669	10,233	515
1959	17,162	661	3,965	11,152	1,384
1960	16,199	756	2,917	10,891	1,625
1961	15,832	417	4,755	9,669	991
1962	15,919	241	5,200	9,921	557
1963	17,185	155	5,235	11,322	473
1964	19,585	175	5,205	13,346	859
1965	23,378	92	5,099	17,018	1,169
1966	30,810	45	7,503	21,324	1,938
1967	28,858 ^r	—	8,046	18,324 ^r	2,488 ^r
1968	29,761 ^r	—	8,542	17,806 ^r	3,413 ^r
1969	21,790 ^a	—	N.A.	18,758	3,032
1970	14,512 ^a	—	N.A.	12,279	2,233
1971	11,629 ^a	—	N.A.	9,928 ^E	1,701

NOTE: Jet includes turboprop and turbojet.

N.A.—Not available.

^a Civil Aircraft Engine Production only after 1969.

^r Revised.

^E Estimate.

Sources: Military: Department of Defense. Civil: 1917-1966: Bureau of the Census. "Current Industrial Reports, Series M37G" (Monthly); 1967-1971: Federal Aviation Administration, Office of Aviation Economics.

AEROSPACE FACTS AND FIGURES, 1972/73

CIVIL AIRCRAFT ENGINE PRODUCTION By Selected Manufacturers Calendar Years 1967 to Date (Number of Engines)

Manufacturer and Engine Designation	1967	1968	1969	1970	1971
TOTAL	20,812	21,219	21,790	14,512	11,629 ^E
Reciprocating	18,324	17,806	18,758	12,279	9,928
Jet	2,488	3,413	3,032	2,233	1,701
Continental	7,845	7,073	7,695	4,384	3,046
O-200/C-90	2,224	1,912	N.A.	N.A.	N.A.
O-300	620	1	N.A.	N.A.	N.A.
IO-346	58	—	N.A.	N.A.	N.A.
IO-360/TSIO-360	1,101	568	N.A.	N.A.	N.A.
O-470/IO-470/TSIO-470/ GIO-470	1,337	1,656	N.A.	N.A.	N.A.
GTSIO-520/TSIO-520/ IO-520	2,385	2,515	N.A.	N.A.	N.A.
PE-150	120	421	N.A.	N.A.	N.A.
General Electric	260	207	192	148	116
CT-58	28	27	16	21	2
CF-700	150	130	54	34	27
CJ-610	82	50	122	93	87
Lycoming	9,841	11,109	9,870	5,199	6,480
O-720/IO-720	27	17	6	36	10
O-541/TIO-541/TIGO-541 .	143	210	142	160	113
O-540/IO-540/TIO-540/ IGO-540/IGSO-540/ IVO-540/VO-540	2,507	2,885	3,580	1,355	1,876
O-480/GO-480/IGSO-480/ GSO-480	203	181	151	100	79
O-435/GO-435/VO-435/ TVO-435	344	307	164	114	133
O-360/IO-360/TIO-360/ HIO-360/AIO-360	2,733	3,077	1,925	1,442	1,828
O-320/IO-320/LIO-320/ AIO-320	3,673	4,055	3,437	1,684	2,007
O-290	6	8	9	6	3
O-235	205	369	456	302	430
Other	—	—	—	—	1
Pratt & Whitney	2,276	2,528	1,655	1,120	594
JT-3D	874	969	542	127	49
JT-12	157	156	129	79	—
JT-8D	1,244	1,401	821	448	176
JT-9D	—	—	163	466	369
Other	1	2	—	—	—

NOTE: Engine production by company does not add to the total of civil aircraft engine production because data for some companies are not available.

^E Estimated.

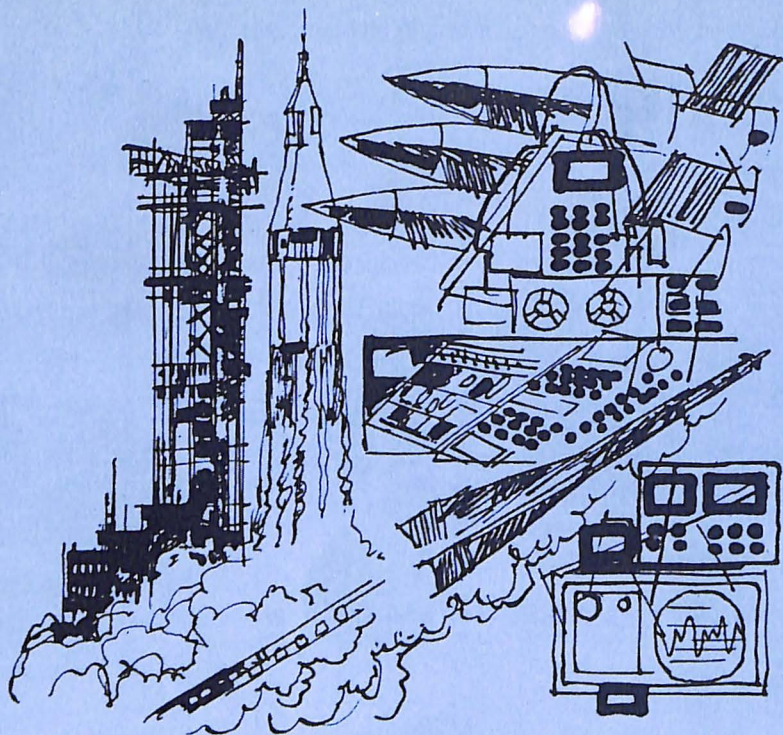
Sources: TOTAL: Federal Aviation Administration, Office of Aviation Economics. Production by Manufacturer: Aerospace Industries Association, company reports.

AIRCRAFT PRODUCTION

MILITARY AIRCRAFT ENGINE ACCEPTANCES Calendar Years 1959 to 1968 (Number of Engines)

ENGINE DESIGNATION	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
TOTAL	4,626	3,674	5,172	5,441	5,390	5,380	5,191	7,548	8,046	8,542
Jet	3,421	2,025	2,821	3,162	2,871	2,638	2,111	3,142	3,190	3,061
J-34.....	139	80	—	—	—	—	—	—	—	—
J-44.....	55	—	—	—	—	—	—	—	—	—
J-48.....	24	—	—	—	—	—	—	—	—	—
J-52.....	36	299	305	471	318	310	202	261	471	363
J-57.....	1,957	565	532	562	476	133	6	—	—	—
J-60.....	1	29	184	219	207	44	48	100	21	—
J-69.....	538	487	284	435	321	335	186	479	587	795
J-75.....	293	256	229	219	174	42	—	—	—	—
J-79.....	309	174	598	752	894	1,279	1,027	1,416	1,174	1,055
J-85.....	69	214	688	486	471	495	642	886	937	844
J-93.....	—	—	1	—	—	—	—	—	—	—
JT-3D.....	—	—	—	18	10	—	—	—	—	4
Turbo-Fan	—	168	683	298	76	195	392	631	831	402
TF-33.....	—	168	683	298	76	182	343	489	468	14
TF-30.....	—	—	—	—	—	13	49	142	355	312
TF-39.....	—	—	—	—	—	—	—	—	8	52
TF-41.....	—	—	—	—	—	—	—	—	—	24
Turbo-Prop	544	724	1,251	1,740	2,288	2,372	2,596	3,730	4,025	5,079
T-33.....	2	—	—	—	—	—	—	—	—	—
T-34.....	63	49	—	—	—	—	—	—	—	—
T-50.....	—	—	43	68	78	131	154	242	159	—
T-53.....	165	339	358	452	759	981	1,284	1,747	1,924	2,706
T-56.....	260	234	522	763	1,019	719	497	566	318	252
T-58.....	54	96	298	384	348	342	370	626	221	329
T-YT-55.....	—	—	30	73	68	138	228	394	462	249
T-64.....	—	—	—	1	16	61	63	155	32	49
T-63.....	—	—	—	—	—	—	—	—	656	1,303
T-73.....	—	—	—	—	—	—	—	—	53	77
T-74.....	—	—	—	—	—	—	—	—	102	114
T-76.....	—	—	—	—	—	—	—	—	98	—
Reciprocating	661	756	417	241	155	175	92	45	—	—
O-435.....	327	189	—	—	—	—	—	—	—	—
O-480.....	66	57	11	—	—	—	—	—	—	—
R-1820.....	155	418	282	241	155	175	92	45	—	—
R-3350.....	113	93	124	—	—	—	—	—	—	—

NOTE: Data from 1969 on not available.
Source: Department of Defense.



Missile Programs

Procurement of guided missiles by all three military services rose during Fiscal Year 1971, and the total Department of Defense outlay for missiles climbed for the fourth year in succession—from \$2.9 billion in FY 1970 to \$3.1 billion in FY 1971. It is expected that this DOD total will climb slightly again in the next year, then drop in FY 1973.

Air Force FY 1971 expenditures were \$1,497 million, compared with 1970's \$1,467 million; Navy, \$791 million, compared with \$702 million; and Army, \$852 million, compared with \$743 million. The Air Force outlay is expected to decline in FY 1972, then rise in the next year. Navy and Army figures are likely to rise and then decline. In all cases the changes will be relatively small.

During FY 1971, total DOD spending for missile research, development, test and evaluation (RDT&E) fell off slightly, for the third consecutive year. It is estimated that RDT&E will show a very small further decline in FY 1972, then increase fairly substantially.

MISSILE PROGRAMS

Net sales of missile systems and parts were down slightly, from \$2.8 billion in calendar year 1970 to \$2.6 billion in 1971. The backlog of orders increased—from \$2.7 billion as of December 31, 1970, to \$3.2 billion a year later. The new backlog total was the highest since 1960.

There were drops in both net sales and backlog of orders for engines and propulsion units for missiles and spacecraft. Sales fell from \$640 million in calendar year 1970 to \$605 million in 1971. Military propulsion sales slipped from \$618 million to \$597 million; non-military from \$22 million to \$8 million.

Total backlog dropped from \$617 million at the end of 1970 to \$511 million twelve months later—a decline closely approximating the gain enjoyed between 1969 and 1970.

A number of missile systems changed status during the year, including the submarine launched Poseidon, ICBM, which went from development into operation, and the Air Force air-to-surface Short-Range Attack Missile (SRAM), which went into production. Work continued on the Army's anti-ballistic missile (ABM) system.

SALES AND BACKLOG REPORTED BY MAJOR MANUFACTURERS OF MISSILE
SYSTEMS AND PARTS
Calendar Years 1961 to Date
(Millions of Dollars)

Year Ending December 31	Missile Systems and Parts	
	Net Sales During Year	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	2,645	3,232

Revised.

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 52.

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).

AEROSPACE FACTS AND FIGURES, 1972/73

SALES AND BACKLOG OF ENGINES AND PROPULSION UNITS FOR MISSILES AND SPACE VEHICLES Reported by Major Manufacturers 1961 to Date (Millions of Dollars)

Year Ending December 31	Net Sales During Year			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	1,135	\$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 ^r	640	618	22	617	610	7
1971	605	597	8	511	503	8

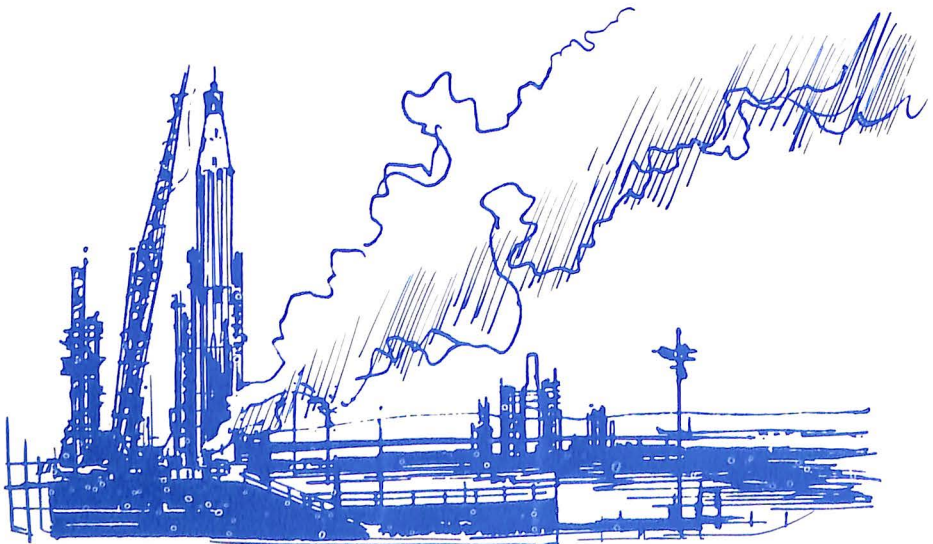
^a Data included in totals for space vehicle systems. See page 62.

^r Revised.

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.

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).



MISSILE PROGRAMS

DEPARTMENT OF DEFENSE OUTLAYS FOR GUIDED MISSILES Fiscal Year 1960 to Date (Millions of Dollars)

Year Ending June 30	TOTAL DEFENSE DEPARTMENT	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 ^E	5,254	3,283	1,971
1973 ^E	5,376	3,109	2,267

^E Estimate.

NOTE: Does not include military assistance.

Source: Department of Defense, OASD (Comptroller), FAD-720, February 3, 1972, and earlier reports.

INTERCONTINENTAL BALLISTICS MISSILES PRODUCED FOR THE AIR FORCE Calendar Year 1961 to Date

Year Ending December 31	Weapons Systems in Acquisition December 31	Intercontinental Ballistic Missiles Delivered
1961	4	111
1962	4	186
1963	2	486
1964	1	405
1965	1	172
1966	1	221
1967	1	216
1968	1	101
1969	1	104
1970	1	83
1971	1	116

Source: Department of Defense.

AEROSPACE FACTS AND FIGURES, 1972/73

DEPARTMENT OF DEFENSE
 OUTLAYS FOR GUIDED MISSILE PROCUREMENT, BY AGENCY
 Fiscal Years 1951 to Date
 (Millions of Dollars)

Year Ending June 30	TOTAL DEFENSE DEPARTMENT	Air Force	Navy	Army
1951	\$ 21	\$ 16	\$ 5	—
1952	169	66	56	\$ 46
1953	245	N.A.	N.A.	N.A.
1954	417	N.A.	N.A.	N.A.
1955	604	N.A.	N.A.	N.A.
1956	1,005	N.A.	N.A.	N.A.
1957	1,855	N.A.	N.A.	N.A.
1958	2,434	N.A.	N.A.	N.A.
1959	3,337	N.A.	N.A.	N.A.
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	2,101	981	496
1965	2,096	1,320	521	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 ^E	3,283	1,433	826	1,024
1973 ^E	3,109	1,510	721	878

NOTE: For data on research and development expenditures for missiles see pages 53 and 73.
 N.A.—Not available.

^E Estimate.

Source: Department of Defense, OASD (Comptroller), FAD-720, February 3, 1972, and earlier reports.

MISSILE PROGRAMS

MAJOR MISSILES IN DEVELOPMENT OR PRODUCTION

Project	Service	Systems Contractor	Propulsion		Guidance Manufacturer	Status
			Manufacturer	Type		
SURFACE-TO-AIR						
Bomarc B Chaparral	USAF Army	Boeing Philco-Ford	Marquardt NAR/Rocket- dyne	Ramjet Solid	Westinghouse GE/Raytheon	Operational Operational
Hawk Nike-Hercules	Army Army	Raytheon Western Electric	Aerojet Thiokol/ Hercules	Solid Solid	Raytheon Bell Tel. Lab./ Western Electric	Operational Operational
Redeye	Army	General Dynamics	Atlantic Research	Solid	Norden	Operational
SAM-D Sea Sparrow	Army USN	Raytheon Raytheon	Thiokol NAR/Rocket- dyne	Solid Solid	— Raytheon	Development Operational
Safeguard/ Spartan	Army	Bell Tel. Lab./ Western Electric	Thiokol	Solid	Bell Tel. Lab./ Western Electric	Development
Safeguard/ Sprint	Army	Bell Tel. Lab./ Western Electric	Hercules	Solid	Bell Tel. Lab./ Western Electric	Development
Standard (MR)	USN	General Dynamics	Hercules	Solid	General Dynamics	Operational
Standard (ER)	USN	General Dynamics	Atlantic Research	Solid	General Dynamics	Operational
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
Aegis/SM 2	USN	RCA	General Dynamics	Solid	General Dynamics	Development
AIR-TO-AIR						
Falcon Falcon	USAF USAF	Hughes Hughes	Thiokol Lockheed Propulsion	Solid Solid	Hughes Hughes	Operational Operational
Super Falcon Genie	USAF USAF	Hughes McDonnell Douglas	Thiokol Thiokol	Solid Solid	Hughes —	Operational Operational
Phoenix	USN	Hughes	Aerojet/ Rocketdyne	Solid	Hughes	Production
Sidewinder 1A	USN	Naval Weapons Center	Naval Ordnance Station	Solid	Philco/GE	Operational
Sidewinder 1C	USN	Naval Weapons Center	NAR/Rocket- dyne	Solid	Raytheon/GE	Operational
Sparrow III	USN	Raytheon	NAR/Rocket- dyne	Solid	Raytheon	Operational

(Continued on next page)

AEROSPACE FACTS AND FIGURES, 1972/73

MAJOR MISSILES IN DEVELOPMENT OR PRODUCTION—Continued

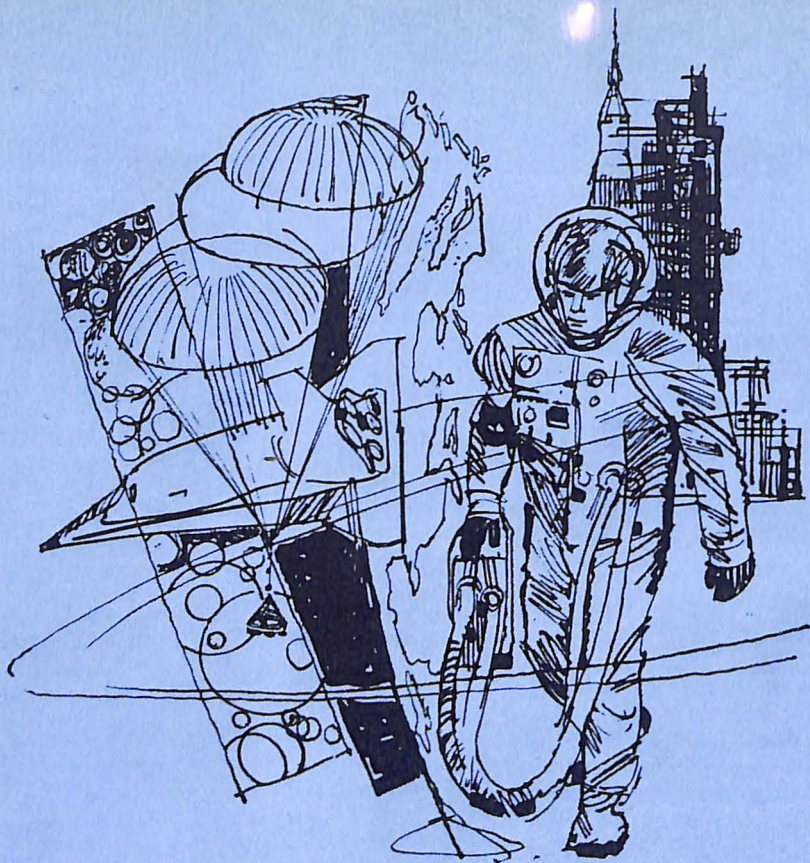
Project	Service	Systems Contractor	Propulsion		Guidance Manufacturer	Status
			Manufacturer	Type		
SURFACE-TO-SURFACE						
Minuteman 2	USAF	Boeing	Thiokol/ Aerojet/ Hercules	Solid	NAR/Auto- netics	Operational
Polaris A2	USN	Lockheed MSC	Aerojet/ Hercules	Solid	GE/MIT/ Hughes/ Raytheon	Operational
Polaris A3	USN	Lockheed MSC	Aerojet/ Hercules	Solid	GE/MIT/ Hughes/ Raytheon	Operational
Poseidon	USN	Lockheed MSC	Thiokol/ Hercules	Solid	GE/MIT/ Hughes/ Raytheon	Operational
Titan II	USAF	Martin Marietta	Aerojet	Liquid	GM/Delco Electronics	Operational
AIR-TO-SURFACE						
Bullpup A	USN	Maxson Electronics	Thiokol	Liquid	Maxson Electronics	Operational
Bullpup B	USN	Maxson Electronics	Thiokol	Liquid	Maxson Electronics	Operational
Condor	USN	Naval Air Systems Command/ NAR	NAR/Rocket- dyne	Solid	NAR/Colum- bus	Development
Harpoon	USN	McDonnell Douglas	Aerojet Garrett/ Teledyne CAE P & W	Solid Turbojet	Texas Instruments	Development
Hound Dog	USAF	NAR	—	Turbojet	NAR/Auto- netics	Operational
Maverick	USAF	Hughes	Thiokol	Solid	—	Production
Quail	USAF	McDonnell Douglas	General Electric	Turbojet	McDonnell Douglas	Operational
SCAD	USAF	—	—	—	—	Development
Shrike	USN	NASC/NWC	Aerojet	Solid	Texas Instruments	Operational
SRAM	USAF	Boeing	Lockheed Propulsion	Solid	Singer	Production
Standard ARM	USN	General Dynamics	Aerojet	Solid	General Dynamics	Operational
Walleye	USN	Martin Marietta/ Hughes	—	Glide Bomb	Martin Marietta/ Hughes	Operational

MISSILE PROGRAMS

MAJOR MISSILES IN DEVELOPMENT OR PRODUCTION—*Continued*

Project	Service	Systems Contractor	Propulsion		Guidance Manufacturer	Status
			Manufacturer	Type		
BATTLEFIELD SUPPORT GUIDED MISSILES						
Lance	Army	LTV Aerospace	NAR/Rocket-dyne	Liquid	LTV Systron-Donner/Arma	Production
Dragon	Army	McDonnell Douglas	McDonnell Douglas	Solid	McDonnell Douglas	Development
Pershing 1-A	Army	Martin Marietta	Thiokol	Solid	Bendix	Operational
Sergeant	Army	Sperry Rand/Univac	Thiokol	Solid	Sperry Rand/Univac	Operational
Shillelagh	Army	Philco-Ford	Amoco Chem.	Solid	Philco-Ford	Operational
SS-11B1	Army	Nord Aviation (France)	Nord Aviation	Solid	Nord Aviation	Operational
TOW	Army	Hughes	Hercules	Solid	—	Operational
UNGUIDED MISSILES						
Honest John	Army	Emerson Electric	Hercules	Solid	—	Operational
ANTI-SUBMARINE						
Asroc Subroc	USN USN	Navy Goodyear Aerospace	Navy Thiokol	Solid Solid	— Singer-Kearfott Div.	Operational Operational

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



Space Programs

As in the two previous years, the most notable progress in the U.S. space program occurred in the Apollo lunar landing and exploration effort. Two highly successful missions were conducted—Apollo 14, launched on January 31, and Apollo 15, which lifted off on July 26.

These were the third and fourth manned lunar landings, and demonstrated the continuing growth of sophistication and capability in the space program. Apollo 14 demonstrated that we can now land a module on the Moon's surface with virtually pinpoint accuracy. Apollo 15 was the first Moon lander to carry a Lunar Roving Vehicle, enabling two astronauts to explore far more territory than could their six predecessors.

Apollo 15 thus supplied more new information than the three previous missions combined, including an eight-foot core sample of soil believed to contain records of the Sun's activities dating back a billion years. Both crews left experiments which continue to transmit data back to Earth.

Planning proceeded during the year for the remaining two Apollo flights,

SPACE PROGRAMS

to be made in 1972, and for the next manned program—the Skylab scientific space station—to be launched in 1973.

Unmanned space flight activity was highlighted by Mariner 9's entry into Martian orbit during November. Mariner 9 had been launched in May. It transmitted many high-quality photographs of Mars, as well as a wealth of data from other sensors indicating, among other things, that the planet is warmer than expected at its south polar cap and colder elsewhere.

The space agency launched two Intelsat IV commercial communications satellites for the Communications Satellite Corporation. Applications Tech-

OUTLAYS FOR SPACE ACTIVITIES
Fiscal Years 1955 to Date
(Millions of Dollars)

Year Ending June 30	TOTAL	National Aeronautics and Space Adminis- tration ^a	Department of Defense ^b	Atomic Energy Commission	Other
1955	\$ 75	\$ 74	\$ 1	N.A.	—
1956	100	71	17	N.A.	\$12
1957	150	76	48	N.A.	26
1958	249	89	136	N.A.	24
1959	521	146	341	N.A.	34
1960	960	401	518	N.A.	41
1961	1,518	744	710	N.A.	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 ^E	4,544	2,954	1,487	64	39
1973 ^E	4,676	2,928	1,647	50	51

NOTE: See Chapter on Research and Development for additional tables.

^E Estimate.

^a Excludes amount for aircraft technology beginning with 1965.

^b This includes the aeronautics budget activity and other activities which contribute to the space effort.

Sources: 1955-1969: The Budget of the United States (Annually). 1970-Date: National Aeronautics and Space Council, Aeronautics and Space Report of the President, (Annually).

AEROSPACE FACTS AND FIGURES, 1972/73

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,
OUTLAYS BY BUDGET FUNCTION
Fiscal Years, 1959 to Date
(Millions of Dollars)

Year Ending June 30	TOTAL EXPENDITURES	Research and Development	Construction of Facilities	Research & Program Management
1959	\$ 145	\$ 34	\$ 25	\$ 87
1960	401	256	54	91
1961	744	487	98	159
1962	1,257	936	114	207
1963	2,552	1,912	225	417
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 ^E	3,181	2,411	43	727
1973 ^E	3,192	2,426	60	706

^E Estimate.

Source: "The Budget of the United States" (Annually).

nology Satellites (ATS) launched earlier continue to provide weather data and are used for a variety of experiments for several organizations. Explorer 42, also put into orbit earlier, found previously unknown X-ray sources. The Orbiting Astronomical Observatory (OAO)-2, launched three years previously, continued to observe and report on celestial bodies, and the Orbiting Solar Observatory (OSO)-7, sent up in September, discovered relatively low-temperature polar regions on the Sun.

A major development in military space activity was the successful launch from Cape Kennedy on November 2 of the first two satellites of Phase II of the Defense Satellite Communications System (DSCS). After test and evaluation, the two spacecraft will be moved to equatorial positions over the Atlantic and Pacific Oceans.

Also during 1971, the second NATA Phase II communications satellite was successfully launched by the United States. And in July the U.S. orbited SOLRAD 10, first in a series of high-altitude satellites for

SPACE PROGRAMS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
RESEARCH AND DEVELOPMENT PROGRAMS BUDGET PLAN
Fiscal Years, 1969 to Date
(Millions of Dollars)

	Fiscal Years Ending June 30				
	1969	1970	1971	1972 ^E	1973 ^E
TOTAL	\$3,193	\$3,110	\$2,542	\$2,508	\$2,601
MANNED SPACE FLIGHT—					
TOTAL	2,177	2,030	1,422	1,285	1,224
Apollo	2,025	1,684	914	601	129
Space flight operations	150	343	507	683	1,094
Advanced missions	2	3	1	1	1
SPACE SCIENCE AND APPLI-					
CATIONS—TOTAL	438	520	566	741	865
Physics and astronomy	125	113	116	110	157
Lunar and planetary explora-					
tion	82	151	145	292	321
Bioscience	33	20	13	—	—
Space applications	98	128	167	188	195
Launch vehicle procurement ...	100	108	125	151	192
AERONAUTICS AND SPACE					
TECHNOLOGY—TOTAL	285	271	260	213	249
Aeronautical research &					
technology	N.A.	96	100	110	163
Space research & technology ...	N.A.	120	105	75	65
Nuclear power & propulsion ...	N.A.	55	55	28	21
TRACKING AND DATA ACQUI-					
SITION—TOTAL	280	278	290	264	259
UNIVERSITY AFFAIRS—TOTAL					
Sustaining university program .	9	7	—	—	—
	9	7	—	—	—
TECHNOLOGY UTILIZATION—					
TOTAL	4	5	4	5	4

N.A.—Not available.

NOTE: Administrative operations costs for NASA are not included.

Source: National Aeronautics and Space Administration, Briefing on the Budget of the United States, January 24, 1972.

^E Estimated.

AEROSPACE FACTS AND FIGURES, 1972/73

enhancing the monitoring of electromagnetic and particle emissions from the Sun. Eventually, these systems will supply continuous real-time predictions of space environment disturbances in support of military communications and other systems affected by solar disturbances.

The Atomic Energy Commission continued to develop nuclear power systems for future use in space as propulsion and on-board electrical power sources. In this connection, an important event was the placing in operation of two more SNAP-27 radioisotope generators by the Apollo 14 and 15 astronauts.

Elsewhere in the Government, the Department of Commerce's Environmental Science Service Administration maintained its work with the ESSA weather satellite; the Departments of Agriculture and Interior moved ahead with plans for instruments in the forthcoming Earth Resources Testing Satellite (ERTS), and the National Science Foundation continued its support to space research.

SALES AND BACKLOG OF SPACE VEHICLE SYSTEMS
(Excluding Engines and Propulsion Units)
Reported by Major Manufacturers
1961 to Date
(Millions of Dollars)

Year Ending December 31	Net Sales During Year			Backlog, December 31		
	TOTAL	Military ^a	Non- military	TOTAL	Military ^a	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	1,967	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 ^r	1,956	1,025	931	1,184	786	398
1971	1,680	819	862	921	608	313

NOTE: Based on data from about 55 companies engaged in the manufacture of aerospace products.

^r Revised.

^a Includes engines and propulsion units.

Source: Bureau of the Census, "Current Industrial Reports," Series MQ37D (Quarterly).

SPACE PROGRAMS

SPACECRAFT LAUNCHINGS AS OF APRIL 2, 1972

Country	TOTAL	Payloads in Earth Orbit	Payloads Decayed	Space Probes
TOTAL	1,376	511	826	39
United States	726	328	377	21
U.S.S.R.	611	153	440	18
France	8	8	—	—
United Kingdom	7	5	2	—
Canada	4	4	—	—
European Space Research Organization	6	3	3	—
Italy	3	—	3	—
Australia	2	1	1	—
Japan	3	3	—	—
People's Republic of China	2	2	—	—
N.A.T.O.	2	2	—	—
West Germany	2	2	—	—

Source: National Aeronautics and Space Administration.

Estimated total space expenditures—civilian and military—fell from \$5.0 billion in Fiscal Year 1971 to \$4.5 billion in FY 1972. A slight increase is expected in the next fiscal year.

Of the estimated FY 1972 total outlays, \$2.9 billion is for NASA, \$1.5 billion for Defense, \$64 million is for AEC, and \$39 million for other departments and agencies.

Total sales of space vehicles (including engines and propulsion systems) by the entire aerospace industry continued their decline of several years, falling to \$3.2 billion in calendar year 1971 compared to \$3.6 billion in 1970. Sales of space vehicle systems alone (excluding engines and propulsion systems) by major manufacturers dropped from \$2.0 to \$1.7 billion during the same period.

The civilian space program in the future will change its emphasis from the Apollo program to the Space Shuttle, NASA's "keystone" system for the next two decades.

NASA funding, including research and development for the Space Shuttle, is expected to remain at the current level during the near future.

AEROSPACE FACTS AND FIGURES, 1972/73

CHRONOLOGY OF MAJOR UNITED STATES LAUNCHINGS, 1971

Date	Designation	Purpose
1971 Jan. 26	Intelsat IV (F-2)	To provide equivalent of 3,000 to 9,000 telephone circuits simultaneously or 12 color TV channels or a combination of telephone, TV, and other forms of communications traffic between North America, South America, and Western Europe.
Jan. 31	Apollo 14	To perform selenological inspection, survey and sampling of materials in a preselected region of the Fra Mauro Formation; to deploy and activate an Apollo Lunar Surface Experiments Package (ALSEP); to develop man's capability to work in the lunar environment; to obtain photographs of candidate exploration sites.
Feb. 3	NATOSAT-2 (NATO 2)	The NATOSAT-2 is a military communications satellite placed in a geostationary orbit over the Mid-Atlantic Ocean. It will be used for command and control of NATO military forces.
Mar. 13	Explorer 43 (IMP-1)	To investigate, during a period of decreasing solar activity, through several solar rotations, the nature of the interplanetary medium and the interplanetary-magnetospheric interaction including characteristic features of the solar wind, the interplanetary fields and the sector structure; and modulation effect of cosmic rays.
Apr. 1	ISIS 2	To inject the spacecraft into a near circular earth orbit which will permit the study of the topside of the ionosphere above the electron peak of the region; to continue and extend the cooperative Canadian/U.S. program of ionospheric studies initiated by <i>Alouette 1</i> by combining sounder data with correlative direct measurements for a time sufficient to cover latitudinal and diurnal variations during a period of declining solar activity.
May 30	Mariner 9	To select a Martian orbit which will permit, during the primary orbital operational life time of 90 days, the viewing of about 70 percent of the planet's surface with the wide angle imaging camera at a resolution of about 1 km. per TV line; to study the dynamic characteristics and time variable features of Mars from a Martian orbit selected to permit the viewing of selected areas periodically during the primary operational lifetime of 90 days.
July 8	Explorer 44 (Solrad 10)	To place the satellite into an orbit that will enable it to monitor the sun's X-ray and ultraviolet emissions in order to better understand the solar physical processes, and to improve the prediction techniques of solar activity and ionospheric disturbances.

(Continued on next page)

SPACE PROGRAMS

CHRONOLOGY OF MAJOR UNITED STATES LAUNCHINGS, 1971 (Continued)

Date	Designation	Purpose
July 26	Apollo 15	To perform selenological inspection, survey, and sampling of materials and surface features in a preselected area of the Hadley-Apennine region; to emplace and activate surface experiments; to evaluate the capability of the Apollo equipment to provide extended lunar surface stay time, increased EVA operations, and surface mobility; to conduct in-flight experiments and photographic tasks from lunar orbit.
Aug. 7	Cannonball 2 (OAR 901)	Accelerometers to model atmospheric densities.
Aug. 16	Eole (CAS-1)	To place the spacecraft into an appropriate earth orbit to analyze the meteorological data acquired from constant density surface balloons for the study of the characteristics and movements of air masses; second cooperative French/United States project.
Sept. 29	OSO 7	To obtain high resolution data from the solar corona in particular spectral bands in the XUV and in the visible regions during one solar rotation.
Nov. 3	DSCS 2-1	To provide communications channels for the automatic voice, automatic digital, and secure voice communications network of the Defense Department.
Nov. 15	Explorer 45	To measure the characteristics and formation of the Earth's ring current and development of main-phase magnetic storms; the relation between magnetic storms, aurora, and the acceleration of particles within the inner magnetosphere and relative importance of various diffusion mechanisms in populating the radiation zones at a 4-5 Earth radii elliptical equatorial orbit.
Dec. 11	Ariel 4 (UK-4)	U.K./U.S. cooperative program to investigate interactions among the plasma, charged particle streams and electromagnetic waves in the upper ionosphere.
Dec. 18	Intelsat IV (F-3)	To provide equivalent of 3,000 to 9,000 telephone circuits simultaneously or 12 color TV channels, or a combination of telephone, TV, and other forms of communication traffic.

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

AEROSPACE FACTS AND FIGURES, 1972/73

U.S. MAN-HOURS SPACE FLIGHT TIME LOG

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)	Jul 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)	Jun 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)	Jun 3, 1966	144	42	1,520	32
Gemini 10 (Young, Collins)	Jul 18, 1966	141	34	1,662	06
Gemini 11 (Conrad, Gordon)	Sep 12, 1966	142	34	1,804	40
Gemini 12 (Lovell, Aldrin)	Nov 11, 1966	189	10	1,993	50
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	9	4,514	32
Apollo 11 (Armstrong, Collins, Aldrin)	Jul 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, Stuart, Mitchell)	Jan 31, 1971	650	06	6,913	08
Apollo 15 (Scott, Worden, Irwin)	Jun 26, 1971	885	36	7,808	44

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

SPACE PROGRAMS

CHRONOLOGY OF MANNED SPACE FLIGHTS, 1969 TO DATE

Launch Date	Project	Pilot	Nation	Duration
Jan 14, 1969	Soyuz 4	Vladimir Shatalov	USSR	71 hr. 22 min.
Jan 15, 1969	Soyuz 5	Boris Volynov Alecksey Yeliseyev Yevgeniv Khrunov	USSR	72 hr. 40 min.
Mar 3, 1969	Apollo 9	James A. McDivitt David R. Scott Russell L. Schweickart	USA	241 hr. 53 min.
May 18, 1969	Apollo 10	Thomas P. Stafford John W. Young Eugene A. Cernan	USA	192 hr. 3 min.
Jul 16, 1969	Apollo 11	Neil A. Armstrong Michael Collins Edwin E. Aldrin, Jr.	USA	195 hr. 19 min.
Oct 11, 1969	Soyuz 6	Georgiv Shonin Valeriy Kubasov	USSR	118 hr. 21 min.
Oct 12, 1969	Soyuz 7	Anatoliy L. Stencko	USSR	118 hr. 43 min.
Oct 13, 1969	Soyuz 8	Vladislav Volkov Viktor Gorbatko	USSR	118 hr. 51 min.
Nov 14, 1969	Apollo 12	Vladimir Shatalov Alecksey Yeliseyev Charles Conrad, Jr. Richard F. Gordon, Jr.	USA	244 hr. 36 min.
Apr 11, 1970	Apollo 13	Alan L. Bean James A. Lovell, Jr. Fred W. Haise, Jr. John L. Swigert, Jr.	USA	142 hr. 55 min.
Jun 1, 1970	Soyuz 9	Andrian G. Nikolayev Vitaliy I. Sevastianov	USSR	424 hr. 59 min.
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 Alecksey Yeliseyev Nikolai Rukavishnikov	USSR	47 hr. 46 min.
Jun 6, 1971	Soyuz 11	Georgi Dobrovolsky Vladislav Volkov Viktor Patsayev	USSR	570 hr. 22 min.
Jun 26, 1971	Apollo 15	David R. Scott Alfred M. Worden James B. Irwin	USA	295 hr. 12 min.

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

AEROSPACE FACTS AND FIGURES, 1972/73

UNITED STATES SPACE LAUNCH VEHICLES

Vehicle	Stages	Thrust (in thousands of pounds)	Payload (pounds)	
			100 Nautical miles Orbit	Escape
Scout	1. Algol (IIB)*	100.9	410	50
	2. Castor II*	60.7		
	3. Antares II*	20.9		
	4. Altair III* or FW4*	5.9		
Thrust-augmented Thor-Delta	1. Thor (SLV-2J) plus nine TX354-5*	205 plus 57 each	4,300	1,050
	2. Delta (DSV-3)	9.3		
	3. TE 364*	15		
Thrust-augmented Thor-Agena	1. Thor (SLV-2H) plus 3 TX 354-5*	170 plus 52 each	2,900	—
	2. Agena	16		
Atlas-Burner II	1. Atlas Booster and Sustainer (SLV-3A)	400	6,000	700
	2. Burner II*	10		
Atlas-Agena	1. Atlas Booster and Sustainer (SLV-3A)	400	8,000	1,430
	2. Agena	16		
Titan IIIB-Agena	1. LR-87	464	9,200	1,700
	2. LR-91	102		
	3. Agena	16		
Titan IIIC	1. Two 5-segment 120" diameter*	2,400	28,000	6,000
	2. LR-87	523		
	3. LR-91	102		
	4. Transage	16		

(Continued on next page)

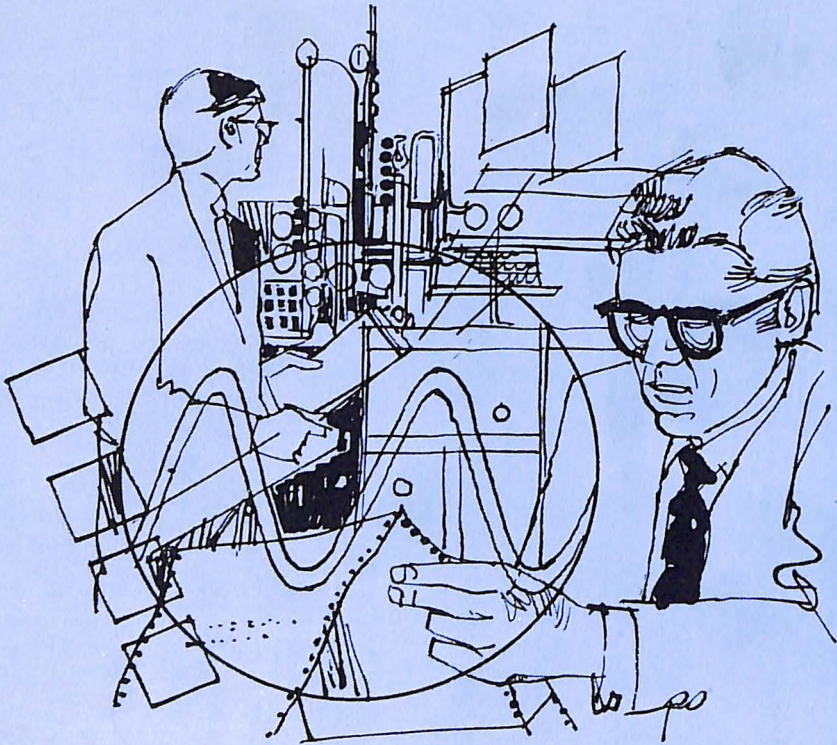
SPACE PROGRAMS

UNITED STATES SPACE LAUNCH VEHICLES—*Continued*

Vehicle	Stages	Thrust (in thousands of pounds)	Payload (pounds)	
			100 Nautical miles Orbit	Escape
Titan IIID	1. Two 5-Segment 120'' diameter*	2,400	20,000	—
	2. LR-87	523		
	3. LR-91	102		
Titan IIID-Centaur	1. Two 5-Segment 120'' diameter*	2,400	—	11,000
	2. LR-87	523		
	3. LR-91	102		
	4. Centaur (Two RL-10)	30		
Atlas-Centaur	1. Atlas Booster and Sustainer	400	11,300	2,700
	2. Centaur (Two RL-10)	30		
Saturn IB	1. S-IB (8H-1)	1,640	40,000	—
	2. S-IVB (1J-2)	230		
Saturn V	1. S-IC (5F-1)	7,570	285,000	103,000
	2. S-II (5J-2)	1,150		
	3. S-IVB (1J2)	230		

* Solid propellant, all other are liquid.

Source: Aeronautics and Space Report of the President (Annual'y).



Research and Development

The Federal Government's expenditures for research and development (R&D) during Fiscal Year 1971, measured in current dollars, declined from \$15.6 billion in FY 1970 to \$15 billion in FY 1971. However, in FY 1972 the overall Federal R&D expenditure is expected to increase to \$15.8 billion, with another rise—to \$16.5 billion—planned for FY 1973.

Allowing for inflation, however, the increase is much more apparent than real, and even the estimated total of \$16.5 billion in FY 1973 will be well below the peak \$16.9 billion Federal R&D investment in FY 1968.

Outlays for DOD R&D activity climbed slightly, from \$7.2 billion in FY 1970 to \$7.3 billion in FY 1971. DOD R&D outlays are expected to rise slightly again in FY 1972 to about \$7.8 billion, and to about \$7.9 billion in FY 1973.

NASA's R&D funding dollars actually declined, from \$3.8 billion in FY 1970 to an estimated \$3.4 billion, in FY 1971, a level that likely will drop to \$3.2 billion in FY 1972 and hold steady in the following year.

RESEARCH AND DEVELOPMENT

The Atomic Energy Commission's R&D cost for FY 1971 was an estimated \$1.3 billion, a figure which is expected to hold virtually steady in FY 1972, and to increase only slightly in FY 1973.

Meanwhile, the R&D expenditures elsewhere in the Government—for health services, social sciences, mass transit and other programs—held relatively steady in FY 1971 at \$2.8 billion, but are expected to jump to \$3.3 billion in FY 1972. The outlook for FY 1973 is for nearly a half-billion increase to about \$3.8 billion.

FEDERAL OUTLAYS FOR RESEARCH AND DEVELOPMENT
Fiscal Years, 1954 to Date
(Millions of Dollars)

Year Ending June 30	TOTAL	Department of Defense	National Aeronautics and Space Adminis- tration	Atomic Energy Commission	Other
1954	\$ 3,148	\$2,487	\$ 90	\$ 383	\$ 188
1955	3,308	2,630	74	385	219
1956	3,446	2,639	71	474	262
1957	4,462	3,371	76	657	358
1958	4,990	3,664	89	804	433
1959	5,803	4,183	145	877	598
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	16,208	7,858	4,252	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 ^E	15,823	8,031	3,181	1,308	3,303
1973 ^E	16,541	8,177	3,192	1,375	3,797

NOTE: Includes military personnel, procurement, civil functions, and some other items not included in other tables. Includes R & D facilities and administrative operating costs.

^E Estimate.

Source: "The Budget of the United States Government." (Annually).

AEROSPACE FACTS AND FIGURES, 1972/73

In the private sector, company spending on applied aerospace R&D during calendar year 1970 (the last year for which figures are available) dropped by some \$170 million to less than \$1.1 billion from its record level of nearly \$1.3 billion in 1969.

Comparing the aerospace industry with all industry from the standpoint

DEPARTMENT OF DEFENSE
OUTLAYS FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION
Fiscal Years 1951 to Date
(Millions of Dollars)

Year Ending June 30	Department of Defense	Air Force	Navy	Army	Other
1951	\$ 758	N.A.	N.A.	N.A.	N.A.
1952	1,165	N.A.	N.A.	N.A.	N.A.
1953	2,148	N.A.	N.A.	N.A.	N.A.
1954	2,187	N.A.	N.A.	N.A.	N.A.
1955	2,261	N.A.	N.A.	N.A.	N.A.
1956	2,101	N.A.	N.A.	N.A.	N.A.
1957	2,406	N.A.	N.A.	N.A.	N.A.
1958	2,504	N.A.	N.A.	N.A.	N.A.
1959	2,866	N.A.	N.A.	N.A.	N.A.
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	181
1963	6,376	3,301	1,429	1,355	291
1964	7,021	3,722	1,578	1,338	384
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 ^E	7,780	2,965	2,426	1,908	481
1973 ^E	7,923	3,031	2,443	1,924	525

^E Estimate.

N.A.—Not available.

NOTE: For RDT&E for aircraft, missiles and astronautics, see page 73.

Source: Department of Defense, OASD (Comptroller), PAD-720, February 3, 1972, and earlier reports.

RESEARCH AND DEVELOPMENT

DEPARTMENT OF DEFENSE
 OUTLAYS FOR RESEARCH, DEVELOPMENT, TEST AND
 EVALUATION, BY FUNCTIONS
 Fiscal Years, 1960 to Date
 (Millions of Dollars)

Year Ending June 30	TOTAL, ALL RDT&E FUNC- TIONS	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	989	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 ^E	7,780	4,371	1,964	1,971	436	3,409
1973 ^E	7,923	4,519	1,767	2,267	485	3,404

^E Estimate.

Source: Department of Defense, OASD (Comptroller), FAD-719, February 3, 1972, and earlier reports.

of industrial research and development, in 1969 the aerospace industry share of \$5.8 billion was 32 percent of the total of \$18.3 billion. In 1970, the last year for which figures are available, the aerospace industry segment of \$5.2 billion amounted to about 29 percent of a national total of \$17.9 billion.

Looking at the aerospace area alone, between 1965 and 1970 the total Federal and corporate funds for industrial research and development in the aerospace area fluctuated between a low of \$5.1 billion to a high of \$5.8 billion in 1969 (\$5.2 billion in 1970). The interesting fact, however, is that the corporate investment by the aerospace industry in research and development rose from \$622 million (12 percent of the total) in 1965 to \$1.1 billion (21 percent) in 1970.

AEROSPACE FACTS AND FIGURES, 1972/73

During this same period (1965 to 1970) the picture of total basic and applied research and development in the aerospace field shows interesting trends.

Overall there has been a 1.5 percent increase, from \$5.1 billion to \$5.2 billion. At the same time corporate investment in basic research has increased 40 percent (from \$30 million to \$42 million) while Federal support of basic research has dropped 50 percent (from \$40 million to \$20 million). In applied research, annual corporate investment increased by 81.1 percent in five years (\$588 million to \$1.1 billion), while Federal investment was decreasing 9 percent (from \$4.4 billion to \$4.0 billion).

In other words, increasing corporate investment in basic and applied

INDUSTRIAL RESEARCH AND DEVELOPMENT, ALL INDUSTRIES
AND THE AEROSPACE INDUSTRY
CALENDAR YEARS 1956 TO DATE
(Millions of Dollars)

Year Ending December 31	TOTAL, RESEARCH AND DEVELOPMENT	AEROSPACE ^a		
		Total	Federal Government Funds	Company Funds
1956	\$6,605	\$2,138	N.A.	N.A.
1957	7,731	2,574	\$2,275	\$299
1958	8,389	2,609	2,276	333
1959	9,618	3,090	2,754	336
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	451
1964	13,512	5,055	4,610	455
1965	14,185	5,098	4,476	622
1966	15,548	5,448	4,695	756
1967	16,415	5,570	4,499	1,070
1968	17,469	5,658	4,506	1,152
1969 ^r	18,318	5,792	4,516	1,276
1970	17,858	5,173	4,066	1,107

^r Revised.

N.A.—Not available.

^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.

Sources: National Science Foundation, Aerospace Industries Association.

RESEARCH AND DEVELOPMENT

INDUSTRIAL RESEARCH AND DEVELOPMENT IN AEROSPACE, BY TYPE OF RESEARCH AND FUND SOURCE Calendar Years 1957 to Date (Millions of Dollars)

Year Ending Decem- ber 31	TOTAL AERO- SPACE	Applied Research and Development Funds			Basic Research Funds		
		Total	Federal Govern- ment Contracts	Com- pany	Total	Federal Govern- ment Contracts	Com- pany
1957	\$2,574	\$2,549	N.A.	N.A.	\$25	N.A.	N.A.
1958	2,609	2,583	\$2,266	\$317	26	\$10	\$16
1959	3,090	3,058	2,733	325	32	18	15
1960	3,514	3,452	3,108	344	62	32	30
1961	3,829	3,789	N.A.	N.A.	40	N.A.	N.A.
1962	4,042	3,987	N.A.	N.A.	55	N.A.	N.A.
1963	4,712	4,653	4,219	434	59	31	28
1964	5,055	4,988	4,532	456	67	34	33
1965	5,098	5,028	4,440	588	70	40	30
1966	5,448	5,380	4,656	724	68	36	32
1967	5,570	5,500	4,479	1,022	70	33	38
1968	5,658	5,592	4,485	1,107	67	25	42
1969 ^E	5,792	5,728	4,492	1,236	64	24	40
1970	5,173	5,111	4,046	1,065	62	20	42

N.A.—Not available.

^E Estimated by the National Science Foundation.

Source: National Science Foundation, Aerospace Industries Association.

aerospace research and development is just about offsetting declining Federal support in this area.

DOD dollar outlays for missile research, development, test and evaluation (RDT&E) are passing aircraft funding. In FY 1971 outlays for aircraft amounted to \$1.7 billion and for missiles \$2.0 billion. In Fiscal 1972 they are expected to be approximately on the same level—\$2.0 billion for aircraft and \$2.0 billion for missiles. In FY 1973 missile RDT&E spending is expected to rise from \$2.0 billion to \$2.3 billion, while aircraft RDT&E funds will decline from \$2.0 billion to \$1.8 billion.

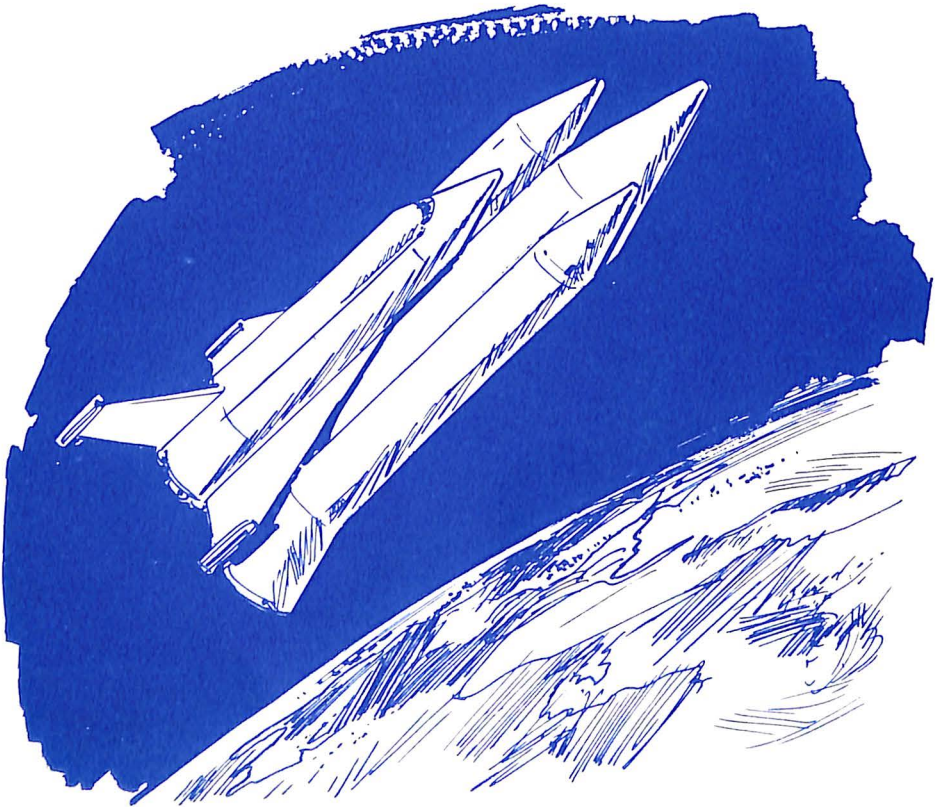
Defense RDT&E expenditures on astronautics, which dropped from \$753 million in FY 1970 to \$519 million in FY 1971, are expected to drop

to \$436 million in FY 1972 and then to increase slightly to \$485 million, in FY 1973.

In 1971 work proceeded on the Skylab, a manned space station based on Apollo technology and hardware and scheduled for launch in calendar 1973 as the last manned U.S. system prior to the Space Shuttle. The Skylab and the Space Shuttle will account for some \$740 million—more than half of NASA's 1973 R&D budget for Manned Space Flight, which is planned at a level of \$1.2 billion.

The Shuttle's orbital vehicle, which will return to Earth after performing a wide variety of satellite launching, repair and retrieval missions, is designed to be reusable, thereby reducing the costs of space exploration in the late 1970s and 1980s.

AEC continued work on a variety of power and propulsion systems for space. R&D work on the NERVA (Nuclear Engine for Rocket Vehicle Application) continued at a reduced level as a result of a decision announced early in 1971.





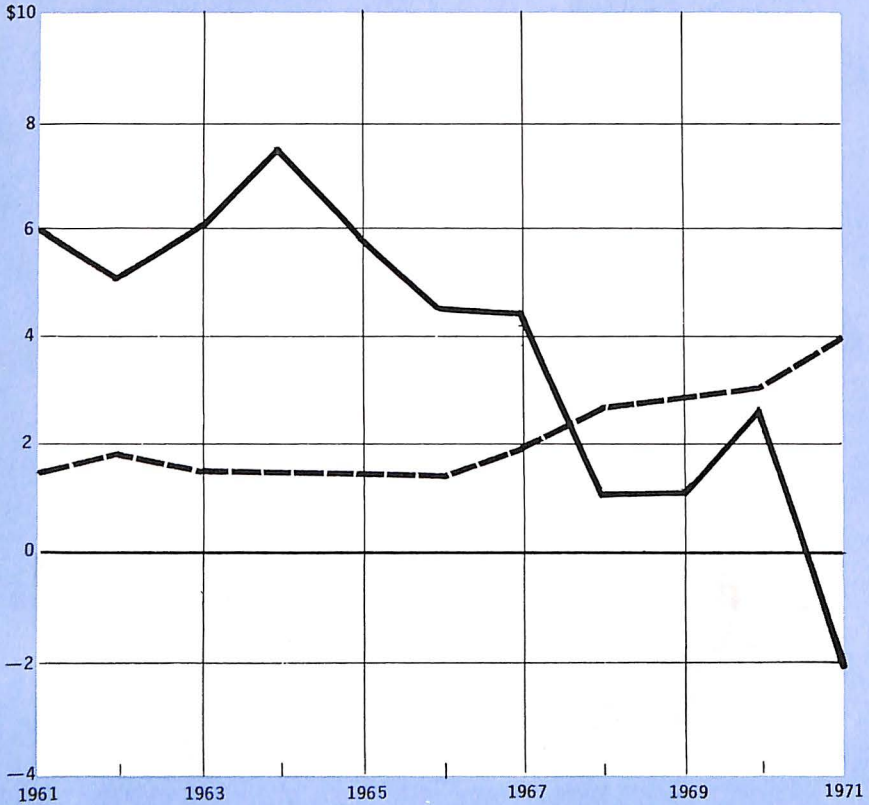
Foreign Trade

U.S. aerospace exports attained a new high of \$4.2 billion for calendar year 1971. This impressive record, including both civil and military aerospace products, exceeded the \$3.4 billion value of 1970 exports by 23 percent. In 1971 aerospace exports represented 18 percent of the industry's total sales, making 1971 the fifth year in which aerospace exports have exceeded \$2 billion.

The aerospace trade balance reached \$3.9 billion during 1971, a 25 percent increase over 1970. Aerospace imports for 1971 reached \$333 million, an 8 percent increase over 1970 and the second highest record year.

The aerospace industry continued to be a leader in the nation's overall export program in spite of increasing foreign competition in many trade areas, including aerospace, and in spite of major revisions in the United States international monetary position affecting the value of the dollar in foreign markets.

U.S. AND AEROSPACE BALANCE OF TRADE
(IN BILLIONS OF DOLLARS)



— U.S.
- - - Aerospace

Source: Bureau of the Census

The steady growth in the U.S. balance of aerospace trade from some \$1.6 billion in 1960 to \$3.9 billion in 1971 probably will tend to level off in 1972 as orders for the highly successful wide-bodied jets—the 747, DC-10, and L-1011—are filled and as foreign competition begins to be felt.

Increasing by 21 percent over 1970, civilian aerospace exports exceeded \$3 billion for the first time in 1971 with large transport aircraft, jet engines,

FOREIGN TRADE

helicopters, parts, spares and equipment all posting substantial advances.

Military aerospace exports made a significant increase in reaching \$1.2 billion in 1971, a 30 percent increase over 1970.

In 1971 foreign airlines continued to receive wide-bodied jet transports in their initial re-equipment programs for this type of equipment. The value of the large commercial jet transports exported in 1971 increased by 21 percent over 1970. The number of units delivered during 1971 decreased by 10 percent.

Europe, Canada and Asia were the principal foreign market areas for commercial helicopters in 1971. The value of the 244 commercial machines exported in 1971 was almost double that of the previous year, whereas the number of units exported decreased by 12 percent.

TOTAL AND AEROSPACE BALANCE OF TRADE
Calendar Years 1960 to Date
(Dollar Figures in Millions)

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	2,708	3,089	3,397	308	114.6
1971 ^b	-2,047	3,863	4,196	333	^c

^r Revised.

^a U. S. Balance of Trade is the difference between exports of domestic merchandise and imports for consumption.

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

^c Not applicable.

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).

AEROSPACE FACTS AND FIGURES, 1972/73

U. S. AEROSPACE IMPORTS
Calendar Years 1955 to Date
(Thousands of Dollars)

Year Ending Dec. 31	TOTAL	Aircraft ^a	Aircraft Engines	Aircraft Parts, N.E.C.
1955	\$ 32,096	\$ 14,415	\$ 1,265	\$ 16,416
1956	86,790	55,594	2,300	28,896
1957	52,671	15,476	1,639	35,556
1958	78,560	32,716	5,991	39,854
1959	68,066	16,273	7,510	44,283
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 ^r	308,334	48,297	33,686	226,351
1971	333,098	39,013	35,996	258,089

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

^r Revised.

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



FOREIGN TRADE

EXPORTS OF U. S. AEROSPACE PRODUCTS Calendar Years 1967 to Date (Millions of Dollars)

	Years Ending Dec. 31				
	1967	1968	1969	1970 ^r	1971
GRAND TOTAL	\$2,248.1	\$2,994.4	\$3,138.4	\$3,397.4	\$4,196.1
TOTAL MILITARY	867.6	765.6	1,111.4	887.3	1,156.7
COMPLETE AIRCRAFT, TOTAL	323.8	407.9	601.0	467.0	636.3
Transports	130.6	100.6	37.9	81.9	80.8
General Aviation	1.2	0.6	0.6	4.5	0.5
Rotary	30.0	9.8	32.5	22.7	43.8
Fighters & Bombers	115.2	278.6	483.6	330.8	477.2
Trainers	15.1	11.0	10.2	12.9	12.0
Other, including Used	31.7	7.3	36.2	14.2	22.0
ENGINES, TOTAL	26.4	31.1	50.0	45.1	48.1
Jet & Gas Turbine	18.8	24.1	38.1	28.1	29.7
Missile Turbine	2.4	3.0	8.0	10.0	11.7
Internal Combustion	5.2	4.0	3.9	7.0	6.7
PARTS, ACCESSORIES & EQUIPMENT INCLUDING SPARES, TOTAL	308.8	192.8	303.4	266.5	350.9
Engine Spares & Accessories	83.8	41.9	58.4	63.9	60.1
Other Spares & Equipment	225.0	150.9	245.0	202.6	290.8
ROCKETS, GUIDED MISSILES & PARTS, TOTAL	208.6	133.8	157.0	108.7	121.4
Complete Rockets & Guided Missiles	34.0	41.6	67.3	8.1	26.0
Parts & Accessories for Rockets & Guided Missiles	174.6	92.2	89.7	100.6	95.4
TOTAL, CIVILIAN	1,380.5	2,228.8	2,027.0	2,510.1	3,039.4
COMPLETE AIRCRAFT, TOTAL	789.3	1,405.4	1,241.0	1,528.2	1,910.4
Transports, New	611.4	1,200.2	946.9	1,283.1	1,566.5
General Aviation, New	91.2	101.3	125.6	112.5	89.6
Rotary Wing, New	25.3	33.0	29.1	26.9	45.7
Other, including Used	61.4	70.9	139.4	105.7	208.6
ENGINES, TOTAL, NEW & USED ..	101.2	115.7	102.4	117.6	148.1
Jet & Gas Turbine	69.6	92.4	82.0	98.4	128.0
Internal Combustion	31.6	23.3	20.4	19.2	20.1
PARTS, ACCESSORIES & EQUIPMENT FOR AIRCRAFT AND ENGINES, INCLUDING SPARES, TOTAL	490.0	707.7	683.6	864.3	980.9
Engine Spares & Accessories ..	132.1	191.0	177.0	201.1	225.5
Other Spares & Equipment	357.9	516.7	506.6	663.2	755.4

^r Revised.

NOTE: For earlier years, see previous editions of "Aerospace Facts and Figures."

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

AEROSPACE FACTS AND FIGURES, 1972/73

U. S. EXPORTS OF CIVIL TRANSPORTS
Calendar Years 1958 to Date
(Value in Millions of Dollars)

Year	TOTAL		Under 33,000 Pounds Airframe Weight		33,000 Pounds and Over Airframe Weight	
	Number	Value	Number	Value	Number	Value
1958	128	\$228.9	45	\$90.8	83	\$138.1
1959	65	107.6	26	4.0	39	103.6
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 ^r	184	1,283.1	19	6.8	165	1,276.3
1971	173	1,566.5	25	24.5	148	1,542.0

^r Revised.

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

EXPORTS OF COMMERCIAL HELICOPTERS,
BY SELECTED U. S. MANUFACTURERS, BY DESTINATION
Calendar Year 1971
(Thousands of Dollars)

Total and Destination	Number	Value ^a
Total	244	\$62,853.0
Canada and Greenland	75	9,783.8
Latin America	33	5,021.4
Europe	49	18,273.5
Asia	57	12,132.3
Oceania	11	1,757.5
Africa	14	6,223.7
Other Country	5	9,660.8

^a Manufacturers' Net Billing Price.

NOTE: Data based on exports for Bell, Fairchild, Hughes Tool Co., Sikorsky and Vertol.
Source: Aerospace Industries Association, company reports.

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EXPORTS OF GENERAL AVIATION AIRCRAFT Calendar Years 1948 to Date

Year Ending Dec. 31	TOTAL Under 3000 Lbs. Airframe Weight Only		3-Places or Less		4-Places and Over			
	Number	Value (Millions)	Number	Value (Millions)	Number	Value (Millions)		
1948....	935	\$4.2	552	\$1.5	383	\$ 2.7		
1950....	408	2.2	173	0.5	235	1.7		
1952....	815	5.6	551	3.1	264	2.5		
1954....	529	4.5	223	1.1	306	3.4		
1956....	966	11.0	340	2.5	626	8.5		
1958....	986	12.1	268	2.2	628	9.9		
1960....	1,528	23.6	374	3.0	1,154	20.6		
1961....	1,646	27.5	582	4.3	1,064	23.2		
1962....	1,458	23.1	431	3.8	1,027	19.3		
1963....	1,583	26.9	484	5.7	1,099	21.2		
1964....	1,834	33.3	640	7.4	1,194	25.9		
Year Ending Dec. 31	TOTAL All Airframe Weights		Single Engine		Multi-Engine			
	Num- ber	Value (Mil- lions)	Num- ber	Value (Mil- lions)	Under 3000 Lbs.		3000 Lbs. & Over	
					Num- ber	Value (Mil- lions)	Num- ber	Value (Mil- lions)
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 ^r	2,037	112.5	1,493	31.5	142	8.7	402	72.3
1971....	1,567	89.6	1,199	26.2	80	5.1	288	58.3

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

AEROSPACE FACTS AND FIGURES, 1972/73

EXPORTS OF COMMERCIAL HELICOPTERS BY SELECTED U. S. MANUFACTURERS Calendar Years 1960 to Date

Year Ending December 31	Number	Value ^a (Thousands of Dollars)
1960.....	89	\$11,445.9
1961.....	122	10,483.4
1962.....	78	11,124.1
1963.....	69	14,982.4
1964.....	102	20,080.0
1965.....	173	25,120.5
1966.....	121	12,100.1
1967.....	220	27,298.1
1968.....	219	26,545.9
1969.....	268	48,047.3
1970.....	276	32,825.6
1971.....	244	62,853.0

^a Manufacturers' Net Billing Price.

NOTE: Data based on exports for Bell, Fairchild, Hughes Tool Co., Sikorsky and Vertol.
Source: Aerospace Industries Association, company reports.

EXPORTS OF LIGHT TRANSPORTS AND GENERAL AVIATION AIRCRAFT, BY SELECTED U.S. MANUFACTURERS, BY DESTINATIONS, CALENDAR YEAR 1971

Total and Destination	Number	Value ^a (Thousands of Dollars)
TOTAL	1,845	\$78,506.7
Canada and Greenland	238	N.A.
Latin America	545	N.A.
Europe	709	N.A.
Asia	66	N.A.
Oceania	82	N.A.
Africa	205	N.A.

N.A.—Not available.

^a Manufacturers' Net Billing Price.

NOTE: Data are based on exports for Aerostar Aircraft, American Aviation, Beech, Bellanca, Cessna, Champion, Gates, Learjet, Lake, Maule, North American Rockwell, Piper and Swearingen of new civil aircraft under 20,000 pounds empty airframe weight.

Source: General Aviation Manufacturers Association.

FOREIGN TRADE



**EXPORTS OF LIGHT TRANSPORTS AND GENERAL AVIATION AIRCRAFT UNDER 20,000 POUNDS AIRFRAME WEIGHT, BY SELECTED U.S. MANUFACTURERS
Calendar Years, 1960 to Date**

Year Ending December 31	Number	Value ^a (Thousands of Dollars)
1960	1,481	\$27,312.6
1961	1,583	29,789.8
1962	1,458	30,938.7
1963	1,579	35,060.6
1964	1,775	44,118.4
1965	2,242	59,596.1
1966	2,903	75,373.3
1967	3,035	76,540.9
1968	2,803	91,448.1
1969	2,626	107,766.7
1970	2,169	99,298.2
1971	1,845	78,506.7

^a Manufacturers' Net Billing Price.

NOTE: 1971 Data based on exports for Aerostar Aircraft, American Aviation, Beech, Bellanca, Cessna, Champion, Gates Learjet, Lake, Maule, North American Rockwell, Piper and Swearingen of new civil aircraft under 20,000 pounds, empty airframe weight.

Sources: 1960-1969, Aerospace Industries Association, company reports. 1970-1971: General Aviation Manufacturers Association, company reports.

AEROSPACE FACTS AND FIGURES, 1972/73

U. S. EXPORTS OF USED AIRCRAFT
 Calendar Years 1958 to Date
 (Value in Millions of Dollars)

Year Ending Dec. 31	TOTAL		Military		Non-Military	
	Number	Value	Number	Value	Number	Value
1958	595	\$35.8	—	—	595	\$35.8
1959	632	22.9	171	\$ 3.1	461	19.8
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	589	31.7	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 ^r	361	106.1	3	2.1	358	104.0
1971	416	205.1	6	0.1	410	205.0

^r Revised.

^a Less than \$0.05 million.

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

FOREIGN TRADE

U. S. EXPORTS OF NEW AND USED CIVIL AIRCRAFT ENGINES Calendar Years 1958 to Date (Value in Millions of Dollars)

Year	TOTAL		Jet and Gas Turbine		Internal Combustion	
	Number	Value	Number	Value	Number	Value
1958	3,904	\$ 48.3	61	\$ 8.0	3,843	\$ 40.3
1959	2,900	43.7	313	18.6	2,587	25.1
1960	3,725	70.7	480	47.5	3,245	23.2
1961	3,630	75.3	364	53.6	3,276	21.7
1962	3,690	63.1	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 ^r	3,790	117.6	634	98.4	3,156	19.2
1971	3,527	148.1	700	128.0	2,827	20.1

^r Revised.

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

AEROSPACE FACTS AND FIGURES, 1972/73

U. S. EXPORTS OF NEW SMALL AIRCRAFT ENGINES^a FOR CIVILIAN AIRCRAFT
Calendar Years 1948 to Date

Year Ending December 31	Number	Value (Thousands of dollars)
1948	660	\$ 326
1949	107	112
1950	247	285
1951	304	509
1952	551	941
1953	347	708
1954	728	1,516
1955	897	2,016
1956	1,371	3,529
1957	1,516	3,860
1958	1,552	4,312
1959	948	2,448
1960	1,464	3,716
1961	1,575	4,399
1962	1,819	4,510
1963	1,292	3,635
1964	1,677	5,257
1965	1,491	4,815
1966	1,714	6,726
1967	1,748	6,816
1968	1,176	7,155
1969	2,321	8,712
1970 ^r	2,179	9,197
1971	1,799	9,421

^r Revised.

^a 1948 and 1949, under 250 h.p.; 1950 to date, under 500 h.p.

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

FOREIGN TRADE

VALUE OF U. S. EXPORTS OF MILITARY AND CIVIL ENGINES^a AND PARTS Calendar Years 1958 to Date (Millions of Dollars)

Year Ending Dec. 31	TOTAL	Internal Combustion			Jet and Gas Turbine			Missile Engines and Parts
		Total	Engines	Parts	Total	Engines	Parts	
1958	\$213.5	\$204.6	\$68.5	\$136.1	\$ 8.9	\$ 8.9	N.A.	N.A.
1959	208.0	186.9	43.1	143.8	21.1	21.1	N.A.	N.A.
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 ^r	427.7	126.4	26.2	100.2	290.8	126.5	164.3	10.5
1971	481.8	112.6	26.8	85.8	356.2	157.7	198.5	13.0

^r Revised.

N.A.—Not available.

^a Includes new and used.

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

AEROSPACE FACTS AND FIGURES, 1972/73

EXPORT-IMPORT BANK GROSS AUTHORIZATIONS OF CREDITS AND GUARANTEES IN SUPPORT OF COMMERCIAL AIRCRAFT EXPORTS Fiscal Years 1957 to Date (Millions of Dollars)

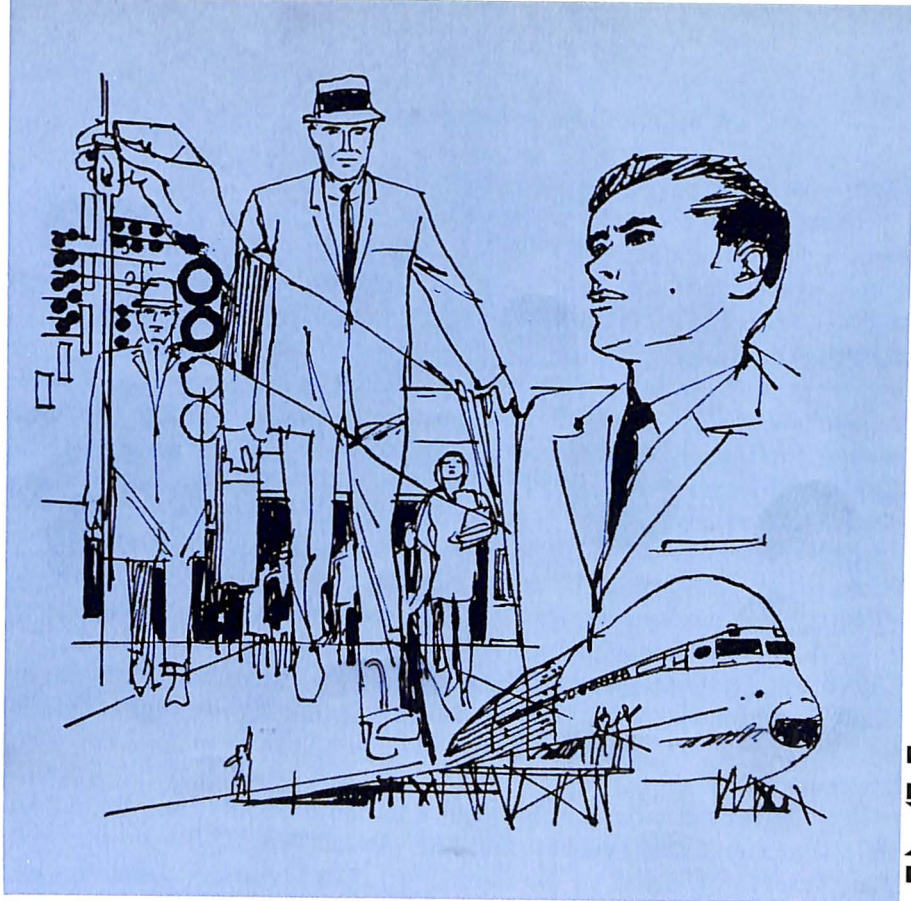
Year Ending June 30	Credits and Guarantees			Credits ^a			Guarantees ^b		
	TOTAL	Jets	Other	TOTAL	Jets	Other	TOTAL	Jets	Other
1957	\$ 46.8	\$ 17.2	\$29.6	\$ 46.8	\$ 17.2	\$29.6	—	—	—
1958	53.4	46.0	7.4	53.4	46.0	7.4	—	—	—
1959	21.8	13.7	8.1	21.8	13.7	8.1	—	—	—
1960	93.8	93.1	0.7	93.8	93.1	0.7	—	—	—
1961	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

^a "Credit" is a commitment of direct financing by the Export-Import Bank.

^b "Guarantee" by the Export-Import Bank of principal and interest on a loan made by another institution such as a commercial bank.

Source: Export-Import Bank of the United States, Office of the Treasurer-Controller.





Manpower

In 1971, continuing reductions in Defense and NASA expenditures and retrenchment in commercial airline operations (meaning reduced orders for aircraft) resulted in a further reduction by 230,000 workers in the U.S. aerospace industry. The 1971 total of 969,000 workers in all categories is down from 1,199,000 in 1970, and down 533,000 from the high point of 1,502,000 in 1968—a drop of 35.5%

The aircraft industry lost 152,000 employees between 1970 and 1971. Other reductions were 12,000 in missiles and space programs, 21,000 in communications equipment manufacturing, and 45,000 in other aerospace industries.

Production workers accounted for 60% of the decrease in aerospace employment, dropping from 603,000 in 1970 to a low of 471,000 in 1971, with a 24% decrease in employment.

The number of scientists and engineers employed in research and development dropped by 24,800 in 1971, and 14,100 of those were

scientists and engineers in the aerospace industry.

Employment of Government and contractor employees on NASA programs declined some 17,300 jobs in 1971, and by 1973 the number of jobs in this segment of the industry is expected to be down by another 13,100—or about 280,000 jobs fewer than those filled during the high year of 1965—a decrease of 68%, mostly in contractor employment.

Average hourly earnings for workers in the aircraft industry rose by 20¢ an hour between 1970 and 1971—from \$4.12 to \$4.32. Average earnings for these production workers moved up from about \$169 per week in 1970 to nearly \$176 per week in 1971—or some \$121 more than the average weekly salary in 1947.

One indicator of a trend toward levelling off the recent steady decline in the aerospace industry, however, is the fact that employment separations fell by 5.7 per hundred workers in 1971, and new hirings increased by a rate of 4.3 per hundred employees throughout the industry.

With this issue AIA presents new estimates of aerospace employment based on special studies by the Department of Labor. (Prior year estimates were based primarily on Department of Labor studies which have been discontinued.)

The employment estimates in this chapter are based on Standard Industrial Classification (SIC) codes—SIC 372-Aircraft, SIC 1925—Missiles and Space (both as published by the Bureau of Labor Statistics). Added to this are estimated for employment on aerospace work in the communications equipment (SIC 3662) and instrument (SIC 3811 and 3821) industries, based on estimated value of aerospace products. Finally, there is added an estimate of aerospace employment in other industries, such as chemicals and machinery. Because a substantial number of employees engaged in missile and space work is still classified as being in the aircraft industry (SIC 372), aircraft employment is overstated while missile and space employment is understated in the tables in this chapter. Total aerospace employment, however, is not affected by this.

MANPOWER

ESTIMATED AEROSPACE EMPLOYMENT Calendar Years 1961 to Date (Thousands of Employees)

YEAR	TOTAL	AIRCRAFT	MISSILES & SPACE	COMMUNI- CATIONS EQUIPMENT	OTHER
<i>Total Employment</i>					
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	1,411	812	126	178	295
1970	1,199	690	102	155	252
1971	969	538	90	134	207
<i>Production Workers</i>					
1961	577	348	56	47	126
1962	596	349	58	59	130
1963	592	351	55	55	131
1964	572	339	54	51	128
1965	574	356	51	43	124
1966	706	446	55	52	153
1967	778	502	55	56	165
1968	779	506	55	58	163
1969	715	468	41	56	150
1970	603	380	32	64	127
1971	471	288	27	56	100

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.

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

AEROSPACE FACTS AND FIGURES, 1972/73

EMPLOYMENT IN THE AIRCRAFT AND PARTS INDUSTRY
Calendar Years 1914 to Date
(Thousands of Employees)

Monthly Average for the Year	TOTAL	Aircraft (Airframes)	Aircraft Engines and Parts	Other Aircraft Parts and Equipment
1914	0.2	N.A.	N.A.	N.A.
1919	4.2	N.A.	N.A.	N.A.
1923	3.5	N.A.	N.A.	N.A.
1929	18.6	N.A.	N.A.	N.A.
1935	14.9	N.A.	N.A.	N.A.
1939	63.2	45.1	11.3	6.8
1940	148.6	101.8	31.4	15.4
1941	347.1	234.6	75.3	37.2
1942	831.7	549.6	192.0	90.1
1943	1,345.6	882.1	314.9	148.6
1944	1,296.6	815.5	339.7	141.4
1945	788.1	489.9	210.9	87.3
1946	237.3	159.0	49.9	28.4
1951	467.8	313.3	95.0	59.5
1953	795.5	472.4	191.2	131.9
1955	761.3	466.6	168.0	126.7
1957	895.8	519.0	213.2	163.6
1959 ^r	720.6	399.3	182.8	138.5
1960 ^r	627.9	337.4	173.6	116.9
1961 ^r	609.7	317.1	186.6	106.0
1962 ^r	638.5	334.7	198.9	104.9
1963 ^r	639.2	335.9	200.7	102.6
1964 ^r	605.4	319.2	189.1	97.1
1965 ^r	624.3	333.3	187.9	103.1
1966 ^r	753.2	417.3	208.1	127.8
1967 ^r	833.6	468.2	221.0	144.4
1968 ^r	852.0	487.8	216.4	147.8
1969 ^r	811.9	463.3	205.0	143.6
1970	689.9	387.8	180.0	122.1
1971	538.1	290.7	153.4	93.9

^r Revised.

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.

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

MANPOWER

PRODUCTION WORKERS IN THE AIRCRAFT AND PARTS INDUSTRY Calendar Years 1914 to Date (Thousands of Production Workers)

Monthly Average for the Year	TOTAL	Aircraft (Airframes)	Aircraft Engines and Parts	Other Aircraft Parts and Equipment
1914	0.2	N.A.	N.A.	N.A.
1919	3.5	N.A.	N.A.	N.A.
1923	2.9	N.A.	N.A.	N.A.
1929	14.7	N.A.	N.A.	N.A.
1935	11.4	N.A.	N.A.	N.A.
1939	49.6	34.8	9.5	5.3
1940	118.0	79.2	26.5	12.3
1941	278.3	183.8	65.0	29.5
1942	674.8	433.9	168.3	72.6
1943	1,090.5	692.1	278.8	119.6
1944	1,016.0	616.3	290.3	109.4
1945	591.0	360.5	164.9	65.6
1946	167.5	113.1	34.0	20.4
1951	348.4	234.8	66.5	47.1
1953	586.2	346.8	136.1	103.3
1955	525.5	322.5	108.5	94.5
1957	591.4	342.4	132.1	116.9
1959 ^r	445.7	248.2	104.1	93.4
1960 ^r	369.6	198.4	96.6	74.6
1961 ^r	347.7	175.9	103.9	67.9
1962 ^r	349.2	175.1	108.5	65.6
1963 ^r	350.8	176.9	107.2	66.7
1964 ^r	338.6	175.7	99.2	63.7
1965 ^r	356.4	184.7	102.7	69.0
1966 ^r	446.4	239.8	119.4	87.2
1967 ^r	501.5	272.9	129.4	99.2
1968 ^r	505.5	280.9	123.9	100.7
1969 ^r	468.1	258.7	114.1	95.3
1970	380.4	206.7	95.0	78.7
1971	287.8	148.7	80.5	58.6

^r Revised.

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.

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

AEROSPACE FACTS AND FIGURES, 1972/73

AVERAGE HOURLY EARNINGS IN AIRCRAFT AND PARTS PLANTS
1947 to Date
PRODUCTION WORKERS ONLY
(Includes Overtime Premiums)

Monthly Average for the Year	TOTAL	Aircraft (Airframes)	Aircraft Engines and Parts	Other Aircraft Parts and Equipment
1947	\$1.37	\$1.36	\$1.38	N.A.
1952	1.89	1.87	1.94	N.A.
1957	2.35	2.35	2.35	N.A.
1958	2.50	2.51	2.51	\$2.44
1959	2.62	2.64	2.64	2.55
1960	2.70	2.71	2.73	2.64
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	2.90
1964	3.05	3.05	3.09	2.99
1965	3.14	3.15	3.17	3.06
1966	3.30	3.34	3.32	3.19
1967	3.44	3.49	3.42	3.33
1968	3.62	3.64	3.65	3.53
1969	3.87	3.90	3.87	3.77
1970	4.12	4.17	4.10	4.01
1971	4.32	4.36	4.36	4.17

NOTE: The production workers surveyed include substantial missile and spacecraft employment.
See NOTE page 95.
N.A.—Not available.
Source: Bureau of Labor Statistics, "Employment and Earnings" (Monthly).

MANPOWER

AVERAGE WEEKLY EARNINGS IN AIRCRAFT AND PARTS PLANTS PRODUCTION WORKERS ONLY 1947 to Date (Includes Overtime Premiums)

Monthly Average for the Year	TOTAL	Aircraft (Airframes)	Aircraft Engines and Parts	Other Aircraft Parts and Equipment
1947	\$ 54.74	\$ 54.13	\$ 54.67	N.A.
1952	81.27	79.85	84.20	N.A.
1957	96.35	95.88	95.65	N.A.
1958	101.25	101.66	99.65	\$100.53
1959	106.63	105.86	108.50	106.34
1960	110.43	110.03	112.20	109.30
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	122.67
1964	125.36	123.53	127.31	126.78
1965	131.88	131.26	133.46	131.27
1966	143.89	143.95	144.09	141.96
1967	146.54	147.28	145.35	146.19
1968	152.04	152.88	151.11	151.44
1969	161.77	163.41	158.28	159.47
1970	168.92	170.97	166.05	167.62
1971	175.82	178.76	173.53	171.80

NOTE: The production workers surveyed include substantial missile and spacecraft employment.
See NOTE page 95.

N.A.—Not available.

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

AEROSPACE FACTS AND FIGURES, 1972/73

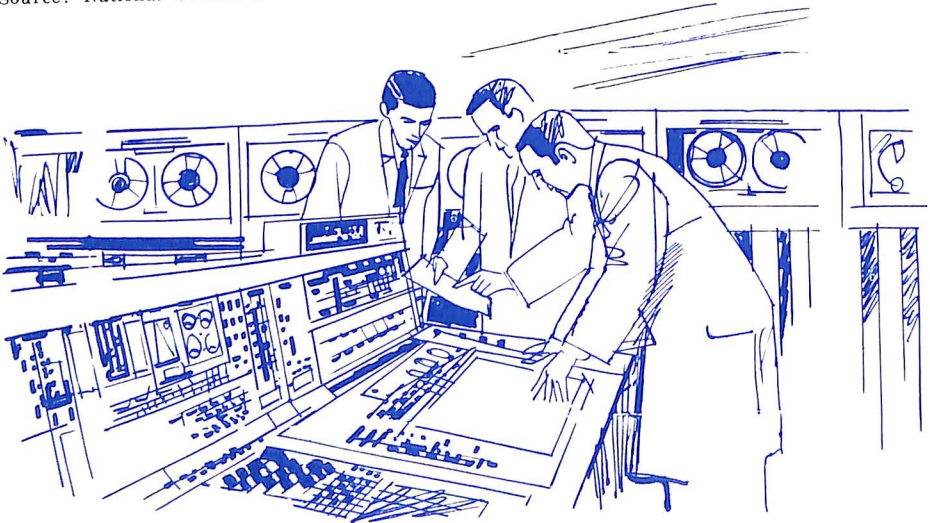
RESEARCH AND DEVELOPMENT—SCIENTISTS AND ENGINEERS— TOTAL AND AEROSPACE 1957 to Date

As of January	TOTAL Scientists and Engineers	Aircraft and Missiles Scientists and Engineers	Aerospace as a Percent of Total
1957	229,400	58,700	25.6
1958	243,800	58,600	24.0
1959	268,400	65,900	24.6
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	99,400	29.2
1965	343,600	97,400	28.3
1966	353,200	97,200	27.5
1967	367,200	98,300	26.8
1968 ^r	376,700	98,700	26.2
1969 ^r	387,100	97,600	25.2
1970 ^r	384,100	90,600	23.6
1971	359,300	76,500	21.3

NOTE: Scientists and engineers working less than full time have been included in terms of their full time equivalent number.

^r Revised.

Source: National Science Foundation.



MANPOWER

EMPLOYMENT ON NATIONAL AERONAUTICS AND SPACE ADMINISTRATION PROGRAMS 1960 to Date

June	NASA Employees	Contractor Employees ^E	TOTAL EMPLOYMENT
1960	10,268	36,500	46,786
1961	17,077	57,500	74,577
1962	22,156	115,500	137,656
1963	27,904	218,400	246,304
1964	31,984	347,100	379,084
1965	33,200	376,700	409,900
1966	33,924	360,000	393,924
1967	33,726	273,200	306,926
1968	32,471	235,400	267,871
1969	31,745	186,600	218,345
1970	31,350	129,500	160,850
1971	29,478	114,100	143,579
1972 ^E	27,500	111,300	138,800
1973 ^E	26,850	103,600	130,450

^E Estimate.

Source: NASA, Fiscal Year 1973 Budget Briefing, January 24, 1972.

INJURY FREQUENCY RATES^a FOR ALL MANUFACTURING AND AIRCRAFT AND PARTS 1958 to Date

Year	All Manufacturing	Aircraft and Parts
1958	11.4	3.5
1959	12.4	3.4
1960	12.0	3.5
1961	11.8	3.5
1962	11.9	3.3
1963	11.9	3.3
1964	12.3	3.4
1965	12.8	3.3
1966	13.6	4.7
1967	14.0	4.3
1968	14.0	3.9
1969	14.8	4.3
1970	15.2	N. A.

^a Defined as the number of disabling injuries per million employee-hours worked.

N.A.—Not available.

Source: Department of Labor, Bureau of Labor Statistics.

AEROSPACE FACTS AND FIGURES, 1972/73

LABOR TURNOVER RATES IN THE AEROSPACE INDUSTRY Calendar Years 1958 to Date (Rates per 100 Employees per Year)

Year Ending Dec. 31	Complete Missiles and Spacecraft		Aircraft							
			TOTAL		Airframes		Engines and Parts		Other Parts and Equipment	
	Acces- sions	Sepa- ra- tions	Acces- sions	Sepa- ra- tions	Acces- sions	Sepa- ra- tions	Acces- sions	Sepa- ra- tions	Acces- sions	Sepa- ra- tions
1958	58.1	26.0	28.3	33.3	26.9	29.8	27.8	35.0	33.8	42.0
1959	48.9	29.2	27.4	37.9	22.4	36.5	29.1	35.0	39.4	45.0
1960	32.3	30.9	28.6	39.2	23.4	33.8	35.1	39.5	34.3	53.9
1961	37.0	27.2	32.6	30.9	31.3	29.3	28.9	24.8	43.2	44.9
1962	37.2	31.6	35.2	31.3	32.9	29.0	30.5	23.9	49.3	47.9
1963	29.9	31.5	28.9	29.4	28.6	27.9	24.3	25.0	39.5	42.9
1964	23.5	39.1	24.7	31.0	23.0	28.9	20.2	28.0	38.6	42.9
1965	32.6	28.7	38.7	26.9	38.5	22.8	32.2	28.4	51.9	20.5
1966	44.1	30.8	48.6	31.5	47.3	28.1	43.2	31.0	61.0	46.9
1967	43.5	34.0	37.4	32.2	36.6	27.9	32.5	34.1	46.6	43.9
1968	40.7	45.4	28.1	32.3	27.1	30.2	22.9	31.3	39.8	41.1
1969	27.4	46.6	23.4	33.2	20.8	30.8	24.6	32.2	31.5	42.4
1970	19.3	48.7	16.1	41.7	13.9	43.8	15.1	32.1	26.2	47.4
1971	21.6	37.2	20.4	36.0	21.6	32.4	13.2	34.8	27.6	50.4

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

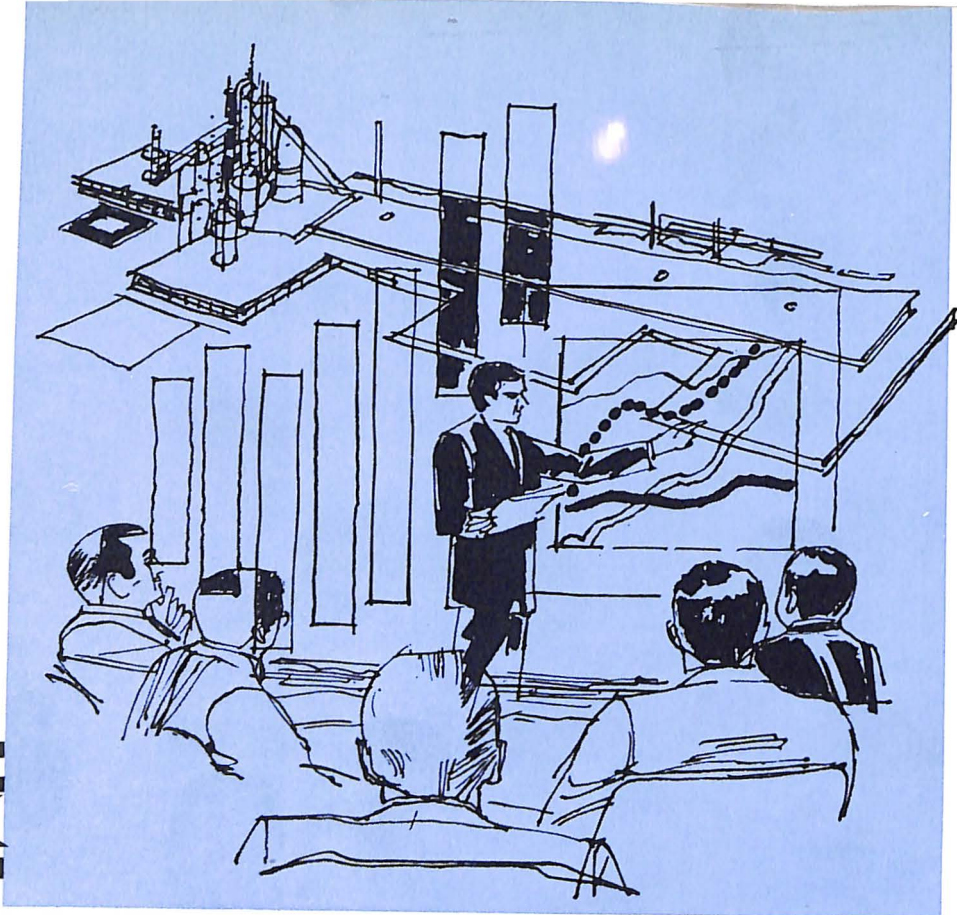
WORK STOPPAGES IN THE AIRCRAFT AND PARTS INDUSTRY
Calendar Years 1927 to Date

Year Ending December 31	Number of Strikes	Number of Workers Involved	Man-Days Idle in Year
1927-1933	4	1,153	18,965
1934	4	3,207	111,048
1935	1	1,700	6,800
1936	—	—	—
1937	6	9,390	90,964
1938	N.A.	N.A.	N.A.
1939	2	1,263	85,319
1940	3	6,270	36,402
1941	29	28,422	112,549
1942	15	6,584	12,416
1943	60	52,481	130,112
1944	103	189,801	386,371
1945	85	150,200	581,000
1946	15	21,300	557,000
1947	10	3,520	67,900
1948	8	21,400	1,100,000
1949	10	10,300	451,000
1950	18	23,900	145,000
1951	29	48,800	765,000
1952	44	81,000	927,000
1953	31	57,800	1,350,000
1954	11	6,350	171,000
1955	38	48,500	403,000
1956	21	23,100	1,040,000
1957	18	23,200	88,200
1958	20	36,700	308,000
1959	26	21,700	312,000
1960	28	82,400	1,190,000
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

N.A.—Not available.

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.

Source: Department of Labor, Bureau of Labor Statistics, Division of Wages and Industrial Relations.



Finance

The general downward trend in the aerospace industry from a high in 1968 continued through 1971.

The profit picture for the industry was not bright in 1971. Net profit (after taxes as a percent of sales) was only 1.8 percent. This figure, the lowest in 10 years, was .2 percentage points down from 1970 and 1.2 percentage points down from 1969. Net profits (after taxes) continued the downward trend from 1968's high of \$857 million to \$423 million in 1971.

Net sales were off nearly \$2 billion in 1971, a fact which was reflected in a decrease from \$501 million to \$423 million in net profit, as noted earlier, and a drop from \$237 million in 1970 to \$181 million in net profit retained in business in 1971.

The net sales figure of \$23.6 billion in 1971, as compared to \$25.5 billion in 1970, was reported by the Securities and Exchange Commission, based on reports by 72 aerospace companies. (These figures differ from

FINANCE

sales reported on preceding pages because of differences in sources and reporting procedures.)

The \$338 million paid by the industry in Federal income taxes amounted to 44.4 percent of total income, 1.3 percentage points higher than in 1970.

During 1971 the total assets of the aerospace industry declined by some \$1.5 billion.

New plant and equipment expenditures of \$380 million by aerospace companies in 1971 continued the downward trend of the preceding three years. However, surveys indicate that the aerospace industry will spend some \$430 million in 1972, an increase that is consistent with the expected general economic improvement for all industries.

Stockholders' equity in the aerospace industry, which had decreased in 1970, climbed back to \$7,317 million, or close to the 1969 level.

Net working capital increased slightly, from \$4,711 million in 1970 to \$4,787 million in 1971.

TAXES AND PROFITS, AEROSPACE COMPANIES 1957 to Date

Year	Net Federal Taxes as a Percent of Total Income	Net Profit After Taxes as a Percent of Sales
1957	52.3%	2.9%
1958	51.7	2.4
1959	52.3	1.6
1960	44.4	1.4
1961	50.7	1.8
1962	47.2	2.4
1963	47.5	2.3
1964	46.9	2.6
1965	46.7	3.2
1966	45.2	3.0
1967	44.5	2.7
1968	46.6	3.2
1969	43.9	3.0
1970	43.1	2.0
1971	44.4	1.8

NOTE: Does not include data for companies which produce aerospace products but are classified in industries other than group 372.

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

AEROSPACE FACTS AND FIGURES, 1972/73

Short term loans increased slightly from \$1,146 million to \$1,152 million in 1971, and long term debt declined from \$4.1 billion to \$4.0 billion, excluding the part due currently.

In FY 1971 the geographic spread of military prime contract awards of \$10,000 or more in the aerospace field was unchanged. The Pacific region including Alaska and Hawaii, lost some ground to the Middle Atlantic region, but still received about 27 percent of the prime contracts for aircraft, missile and space systems, and electronics and communications equipment. The other regions, in descending order, were South Central, New England, South Atlantic, East North Central, West North Central and Mountain.

The Pacific and Middle Atlantic regions also led in dollar value of prime contract awards for research, development, test and evaluation (RDT&E) work.

The Lockheed Aircraft Corporation retained its position as first among Department of Defense contractors from a dollar standpoint, with General Dynamics Corporation second, as it was in FY 1970.

McDonnell Douglas Corporation moved up from third to first place among major NASA contractors, displacing North American Rockwell which was first in FY 1970 and second in FY 1971.

INCOME ACCOUNTS, AEROSPACE COMPANIES
1967 to Date
(Millions of Dollars)

	1967	1968	1969	1970	1971
Net Sales	\$22,739	\$26,852	\$26,392	\$25,505	\$23,606
Net Profit from Operations	1,152	1,661	1,493	980	893
Total Income before Federal Income Taxes	1,099	1,606	1,433	881	761
Provision for Federal Income Taxes	489	749	629	380	338
Net Profit after Taxes	610	857	804	501	423
Net Profit Retained in Business .	382	552	467	237	181

NOTE: Does not include data for companies which produce aerospace products but are classified in other than industry group 372. Includes 72 companies.
Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations."

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BALANCE SHEET COMPARISONS, AEROSPACE COMPANIES 1967 to Date (Millions of Dollars)

	1967	1968	1969	1970	1971
Assets:					
Current Assets					
Cash	\$ 460	\$ 576	\$ 763	\$ 758	\$ 844
U. S. Government Securities ..	16	37	170	9	4
Total Cash and U. S. Government Securities ..	\$ 476	\$ 613	\$ 933	\$ 767	\$ 848
Receivables (total)	2,387	2,840	3,318	3,254	3,400
Inventories (gross)	7,550	9,267	11,179	10,763	9,089
Other current assets	314	396	435	467	458
Total Current Assets	\$10,727	\$13,116	\$15,865	\$15,251	\$13,795
Total Net Plant	2,849	3,542	4,496	4,527	4,296
Other Non-Current Assets	1,128	1,674	2,317	2,639	2,789
Total Assets	\$14,704	\$18,332	\$22,678	\$22,417	\$20,880
Liabilities:					
Current Liabilities					
Short term loans	\$ 1,055	\$ 789	\$ 1,132	\$ 1,146	\$ 1,152
Advances by U.S. Govt.	3,578	4,317	5,135	4,241	1,449
Trade accounts and notes payable	1,391	1,922	2,303	2,212	1,860
Federal income taxes accrued	229	304	365	455	463
Installments due on long term debts	88	110	186	338	325
Other current liabilities	1,558	1,906	2,213	2,148	3,759
Total Current Liabilities ..	\$ 7,899	\$ 9,348	\$11,334	\$10,540	\$ 9,008
Long Term Debt	1,897	2,668	3,618	4,113	4,004
Other Non-Current Liabilities .	186	279	412	514	551
Total Liabilities	\$ 9,982	\$12,295	\$15,364	\$15,167	\$13,563
Stockholders' Equity:					
Capital Stock	\$ 1,785	\$ 2,254	\$ 2,505	\$ 2,491	\$ 2,541
Earned Surplus and Reserves ..	2,937	3,783	4,807	4,757	4,776
Total Net Worth	\$ 4,722	\$ 6,037	\$ 7,312	\$ 7,248	\$ 7,317
Total Liabilities and Stockholders' Equity	\$14,704	\$18,332	\$22,678	\$22,417	\$20,880
Net Working Capital	\$ 2,828	\$ 3,766	\$ 4,531	\$ 4,711	\$ 4,787

NOTE: Includes 72 companies classified in industry group 372 which filed reports with the Securities and Exchange Commission.

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

AEROSPACE FACTS AND FIGURES, 1972/73

NEW PLANT AND EQUIPMENT EXPENDITURES
Calendar Years 1947 to Date
(Billions of Dollars)

Year Ending December 31	All Industries	All Manufacturing Industries	Durable Goods	Aircraft, Including Guided Missiles and Space Vehicles
1947	\$19.33	\$ 8.44	\$ 3.25	\$0.04
1948	21.30	9.01	3.30	0.05
1949	18.98	7.12	2.45	0.05
1950	20.21	7.39	2.94	0.06
1951	25.46	10.71	4.82	0.18
1952	26.43	11.45	5.21	0.18
1953	28.20	11.86	5.31	0.15
1954	27.19	11.24	4.91	0.15
1955	29.53	11.89	5.41	0.23
1956	35.73	15.40	7.45	0.37
1957	37.94	16.51	7.84	0.48
1958	31.89	12.38	5.61	0.30
1959	33.55	12.77	5.81	0.30
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	0.84
1970	79.71	31.95	15.80	0.55
1971	81.47	30.21	14.29	0.38
1972 ^a	88.90	31.42	15.02	0.43

^a Plans according to a survey conducted in January & February 1972.
Sources: 1947-1967: U.S. Department of Commerce, Survey of Current Business, January 1970, p. 25; 1968-1971: U.S. Department of Commerce, U.S. Securities and Exchange Commission, Joint Statistical Report; 1972: U.S. Department of Commerce, Bureau of Economic Analysis, BEA 72-13, March 6, 1972.

FINANCE

MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR SELECTED MAJOR MILITARY HARD GOODS, BY GEOGRAPHIC REGION Fiscal Years 1969-1971

Program and Region	Million Dollars			Percent of Program Total		
	1969	1970	1971	1969	1970	1971
AIRCRAFT	\$8,335	\$6,993	\$7,126	100.0	100.0	100.0
New England	1,308	955	779	15.7	13.7	10.9
Middle Atlantic	927	988	1,277	11.1	14.1	17.9
East North Central	1,154	682	670	13.8	9.7	9.4
West North Central	746	742	748	9.0	10.6	10.5
South Atlantic	1,070	1,060	814	12.8	15.2	11.4
South Central	2,083	1,727	1,813	25.0	24.7	25.5
Mountain	58	69	53	0.7	1.0	0.8
Pacific ^a	989	769	972	11.9	11.0	13.6
MISSILE AND SPACE SYSTEMS	\$5,474	\$5,021	\$4,634	100.0	100.0	100.0
New England	702	605	616	12.8	12.0	13.3
Middle Atlantic	754	640	716	13.8	12.8	15.4
East North Central	128	128	144	2.3	2.6	3.1
West North Central	121	131	96	2.2	2.6	2.1
South Atlantic	499	508	537	9.1	10.1	11.6
South Central	125	100	133	2.3	2.0	2.9
Mountain	317	305	206	5.9	6.1	4.4
Pacific ^a	2,828	2,604	2,186	51.6	51.8	47.2
ELECTRONICS AND COMMUNICATION EQUIPMENT	\$4,036	\$3,519	\$3,398	100.0	100.0	100.0
New England	486	444	390	12.0	12.6	11.5
Middle Atlantic	1,026	797	832	25.4	22.7	24.5
East North Central	447	290	296	11.1	8.2	8.7
West North Central	221	154	127	5.5	4.4	3.7
South Atlantic	596	622	516	14.8	17.7	15.2
South Central	262	265	232	6.5	7.5	6.8
Mountain	96	88	78	2.4	2.5	2.3
Pacific ^a	902	859	927	22.3	24.4	27.3

^a Includes Alaska & Hawaii.

Source: Department of Defense, Office of the Secretary of Defense, Directorate For Information Operations, "Military Prime Contract Awards by Region and State, Fiscal Years 1969, 1970, 1971."

AEROSPACE FACTS AND FIGURES, 1972/73

MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION WORK, BY REGION AND BY TYPE OF CONTRACTOR Fiscal Year 1971 (Dollar Figures in Millions)

Region	TOTAL		Type of Contractor					
			Educational Institutions		Other Non-Profit Institutions ^a		Business Firms	
	Million Dollars	Per- cent	Million Dollars	Per- cent	Million Dollars	Per- cent	Million Dollars	Per- cent
TOTAL	\$5,452	100.0	\$336	100.0	\$281	100.0	\$4,835	100.0
New England . . .	543	10.0	101	30.2	38	13.4	404	8.4
Middle Atlantic .	1,292	23.7	31	9.3	30	10.9	1,230	25.4
East North Central	286	5.2	31	9.3	20	7.1	234	4.8
West North Central	404	7.4	5	1.6	1	0.4	397	8.2
South Atlantic . .	709	13.0	97	28.8	57	20.4	555	11.5
South Central . . .	232	4.2	13	3.9	13	4.6	206	4.2
Mountain	120	2.2	16	4.9	8	2.7	96	2.0
Pacific ^b	1,866	34.2	40	11.9	114	40.5	1,713	35.4

^a Includes contracts with other government agencies.

^b Includes Alaska and Hawaii.

Source: Department of Defense, Office of the Secretary of Defense, Directorate For Information Operations, "Military Prime Contract Awards by Region and State, Fiscal Years 1969, 1970, 1971."

MAJOR DEFENSE CONTRACTORS
 (Listed by rank according to net value of military prime contracts
 awarded July 1, 1970-June 30, 1971)
 (Millions of Dollars)

Company	Fiscal Years Ending				
	June 30, 1967	June 30, 1968	June 30, 1969	June 30, 1970	June 30, 1971
U. S. TOTAL ALL CONTRACTS	\$39,219	\$38,827	\$25,175	\$31,315	\$29,752
Lockheed Aircraft Corp. .	1,807	1,870	2,040	1,848	1,510
General Dynamics Corp. .	1,832	2,239	1,243	1,183	1,489
American Telephone & Telegraph Co.	673	776	915	931	1,200
Grumman Corp.	488	629	417	661	1,098
General Electric Co.	1,290	1,489	1,621	1,001	1,041
Tenneco Inc.	^a	^a	237	249	917
McDonnell Douglas Corp.	2,125	1,101	1,070	883	897
United Aircraft Corp. . . .	1,097	1,329	997	874	733
Boeing	912	762	654	475	732
Ling Temco Vought Inc. . .	535	754	914	479	725
Litton Industries, Inc. . . .	180	466	317	543	516
Hughes Aircraft Co.	420	286	439	497	516
North American Rockwell Corp. ^b	689	669	674	707	478
Raytheon	403	452	547	380	454
Westinghouse Electric Corp. ^b	453	251	430	418	437
Sperry Rand Corp.	484	447	468	399	359
General Motors Corp. . . .	625	630	584	386	344
Textron Inc.	497	501	428	431	325
International Business Machines Corp.	195	224	257	256	316
American Motors Corp. . . .	^a	^a	^a	266	251
R.C.A. Corp.	268	255	299	263	251
Honeywell Inc.	314	352	436	398	237
International Telephone & Telegraph Corp.	255	242	238	217	233
Ford Motor Co.	404	381	396	346	218
Teledyne Inc.	88	93	309	238	216
Martin Marietta Corp. . . .	290	394	264	251	187
Standard Oil Co. (N.J.) . . .	235	274	291	229	187
TRW Inc.	121	128	170	179	177
Avco Corp.	449	584	456	270	171
Olin Corp.	154	329	354	248	163

^a Not in list of major contractors for indicated year.

^b North American only before FY 1968.

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

MAJOR NATIONAL AERONAUTICS AND SPACE ADMINISTRATION CONTRACTORS
(Listed by rank according to net value of NASA prime contracts
awarded July 1, 1970 to June 30, 1971)
(Millions of Dollars)

Company	Fiscal Years Ending				
	June 30, 1967	June 30, 1968	June 30, 1969	June 30, 1970	June 30, 1971
U. S. TOTAL ALL CONTRACTS	\$3,864.1	\$3,446.7	\$3,022.3	\$2,759.2	\$2,279.5
McDonnell Douglas Corp. North American	243.9	209.0	207.5	236.3	302.9
Rockwell Corp. ^a	983.8	838.7	680.9	531.5	172.5
General Electric Co.	179.3	190.7	150.1	131.7	161.4
Bendix Corp.	120.0	123.8	127.6	109.8	121.4
Boeing Co.	273.5	296.7	228.7	158.6	114.4
Grumman Corp.	481.1	394.1	369.2	284.4	113.7
Martin Marietta Corp.	12.8	26.8	56.0	108.0	107.6
R.C.A. Corp.	57.5	63.2	51.6	54.5	93.9
International Business Machines Corp.	186.4	147.7	112.5	133.4	72.4
TRW Inc.	52.6	52.4	50.0	58.3	62.3
Aerojet-General Corp.	95.7	67.1	64.9	71.6	54.6
General Dynamics Corp.	61.0	54.4	34.0	38.0	50.8
Sperry Rand Corp.	38.7	31.8	34.1	48.1	31.7
United Aircraft Corp.	40.0	18.1	26.2	27.1	28.4
Lockheed Electronics ^b	—	—	—	—	26.5
Lockheed Aircraft Corp.	42.0	40.5	39.8	41.0	24.8
Philco-Ford Corp.	32.1	31.8	22.4	24.0	23.1
Service Technology Corp.	^d	^d	26.2	27.5	22.4
Trans World Airlines	25.1	25.3	35.4	36.0	22.3
Federal Electric Corp.	12.3	22.0	27.0	26.3	21.8
Hughes Aircraft Co.	19.9	9.7	7.5	9.0	20.9
General Motors Corp.	65.2	46.8	30.9	20.4	19.6
Computer Sciences Corp.	11.8	11.8	8.3	11.0	17.4
Fairchild Industries	9.8	6.7	6.9	1.9	16.4
LTV Aerospace Corp.	46.3	42.7	18.3	17.9	15.4
Chrysler Corp.	76.6	62.6	42.5	16.7	15.3
Singer Company ^c	25.0	12.4	9.7	12.3	13.9
Northrop Corp.	8.8	15.4	12.4	9.4	12.3
Honeywell Inc.	22.6	15.7	8.1	11.5	11.9
Radiation, Inc.	2.7	5.5	1.9	^d	11.4

^a North American only before FY 1968.

^b Formerly a Division of Lockheed Aircraft Corp.

^c General Precision only before FY 1969.

^d Not in list of major contractors for indicated year.

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



Air Transportation

According to the Air Transport Association, the scheduled airlines of the United States managed a turnaround in earnings during 1971 for a net profit of some \$30 million, compared with 1970's net loss of \$200 million, the worst in airline history.

The shift from loss in 1970 to profit in 1971 must be viewed in light of the fact that U.S. airlines shared in the \$58.5 million Government refund to U.S. and foreign airlines after Congress cancelled the U.S. supersonic transport development program.

During 1971 U.S. carriers flew 135,652 million revenue passenger miles (RPM), compared to 1970's 131,710 million revenue passenger miles.

U.S. cargo ton-miles also were up in 1971 to 4,637 million, an increase of 20 percent over the 3,862 million air cargo ton-miles flown in 1970.

In world airline operations, excluding mainland China, the carriers flew 403 million passengers, compared with 385 million in 1970.

During 1970, the last year reported to date, free world commercial

AEROSPACE FACTS AND FIGURES, 1972/73

airlines operated 3,983 aircraft, of which 3,042 (76.4 percent) were manufactured in the United States.

In speaking of “. . . the industry’s plant—its multi-billion dollar fleet of new jet aircraft—as new as tomorrow,” Stuart G. Tipton, president of the Air Transport Association, said: “No other major industry re-equips itself at the rate of the airlines, and this re-equipment will continue with billions of dollars worth of new advanced technology aircraft to be delivered over the next three years.”

For example, in January 1972 U.S. airlines operated a total of 2,642 aircraft, of which 2,493 (94 percent) were turbine-powered.

UNITED STATES SCHEDULED AIRLINES
Selected Calendar Years, 1949 to Date

Year Ending Dec 31	Revenue Miles Flown (Millions)	Passengers Carried (Millions)	Revenue Passenger- Miles (Millions)	Cargo Ton-Miles ^a (Millions)	Mail Ton-Miles ^b (Millions)
1949	463	17	8,827	196	66
1951	527	25	13,204	324	92
1953	657	32	18,245	359	106
1955	780	42	24,351	503	150
1956	869	46	27,625	634	160
1957	976	49	31,261	721	169
1958	973	49	31,499	726	185
1959	1,030	56	36,372	853	209
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 ^r	2,418	170	131,710	3,862	1,484
1971	2,379	174	135,652	4,637	1,327

^r Revised.

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.

Source: Civil Aeronautics Board.

WORLD CIVIL AIRLINES
 Selected Calendar Years, 1919 to Date
 (Revenue Traffic, Scheduled Services, International and Domestic)
 (Data in Millions)

Year Ending December 31	Miles Flown	Passengers Carried	Passenger- Miles	Freight Ton-Miles ^r	Mail Ton-Miles
Excludes USSR					
1919	1	N.A.	N.A.	N.A.	N.A.
1929	55	N.A.	105	N.A.	N.A.
1934	100	N.A.	405	N.A.	N.A.
1939	185	N.A.	1,260	N.A.	N.A.
1944	260	N.A.	3,410	N.A.	N.A.
1949	840	27	15,000	370	130
1951	1,005	42	22,000	595	160
1953 ^r	1,210	53	29,000	680	190
1955	1,425	68	38,000	850	255
1956	1,580	77	44,000	960	275
1957	1,765	86	51,000	1,050	295
1958	1,820	88	53,000	1,075	320
1959 ^r	1,920	98	61,000	1,255	355
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 ^r	2,780	200	142,000	3,905	1,050
1967 ^r	3,280	233	169,500	4,470	1,295
1968	3,730	262	192,500	5,425	1,610
1969 ^r	4,170	290	218,000	6,685	1,720
1970 ^r	4,370	307	239,500	7,165	1,880
1971	4,340	320	245,000	7,405	1,760
Includes USSR					
1970	N.A.	385	287,000	8,180	2,160
1971	N.A.	403	302,000	8,540	1,990

N.A.—Not available.

^r Revised.

NOTE: Excludes the People's Republic of China, and States which were not members of ICAO at 31 December 1971.

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

AEROSPACE FACTS AND FIGURES, 1972/73

COMPOSITION OF U.S. AIR LINE FLEET, BY TYPE OF AIRCRAFT, NUMBER OF ENGINES, AND MODEL, JANUARY 1, 1970, 1971 & 1972
(Number of Aircraft)

Type of Aircraft, Number of Engines, and Model	1970	1971	1972
TOTAL AIRCRAFT	2,690	2,679	2,642
Total fixed-wing	2,672	2,663	2,628
Turbine-powered—total	2,448	2,510	2,482
Four-engine—total	997	1,041	978
Turbojet—total	886	931	890
Boeing 707	428	406	365
Boeing 720	127	115	106
Boeing 747	1	79	104
Convair 880	41	41	41
Convair 990	6	5	8
McDonnell Douglas DC-8	283	285	265
Lockheed L-1329	—	—	1
Turboprop—total	111	110	88
Armstrong Whitworth Argosy AW-650	8	8	6
Canadair CL-44	9	8	1
Lockheed 188	73	69	60
Lockheed 382	18	22	21
Vickers Viscount 745	3	3	—
Three-engine—total	628	659	678
Turbojet—total	628	659	678
Boeing 727	628	659	665
McDonnell Douglas DC-10	—	—	13
Twin-engine—total	818	805	823
Turbojet—total	554	546	564
Boeing 737	147	149	155
British Aircraft Corp. BAC-111	60	59	62
Sud Aviation Caravelle SE-210	20	—	—
Dassault MD-20	—	—	5
McDonnell Douglas DC-9	327	337	341
Hamburger Flugzeugbau HF-320	—	1	1
Turboprop-total	264	259	259
Beech 99	—	3	5
Boeing 377S	—	—	1
Convair 580	119	108	106
Convair 600	24	24	24
Convair 640	—	10	9
DeHavilland DHC-6	9	6	8
Fairchild F-27	38	37	34
Fairchild FH-227	53	47	48
Grumman G-159	1	1	1
Grumman G21T	1	—	—
Nihon YS-11	17	21	21
Short SC-7	2	2	2

(Continued on next page)

AIR TRANSPORTATION

COMPOSITION OF U.S. AIR LINE FLEET, BY TYPE OF AIRCRAFT, NUMBER OF ENGINES AND MODEL, JANUARY 1, 1970, 1971 & 1972—*Continued*
(Number of Aircraft)

Type of Aircraft, Number of Engines, and Model	1970	1971	1972
Single-engine turboprop—total	5	5	3
Pilatus PC-6A	2	2	1
Pilatus PC-6B	3	3	2
Piston-powered—total	224	153	146
Four-engine—total	64	34	31
Boeing 377	1	2	1
Douglas DC-4	11	8	4
Douglas DC-6	33	17	17
Douglas DC-7	14	6	7
Lockheed 749	1	1	1
Lockheed 1049/1649	4	—	1
Twin-engine—total	153	110	104
Aero Commander 500	—	—	1
Aero Commander 680E	1	1	2
Convair 28-5-ACF	2	—	—
Convair 240	1	—	—
Convair 340/440	7	6	5
Curtiss CW-46	43	42	31
Douglas DC-3	37	22	23
Fairchild FC-82	2	2	2
Grumman G-21	11	12	12
Grumman G-44	3	2	2
Grumman G-73	1	1	1
Grumman SA-16	2	—	—
Martin 202	1	1	1
Martin 404	38	19	22
Other	4	2	2
Single-engine—total	7	9	11
Rotary Wing—total	18	16	14
Turbine-powered—total	15	13	11
Sikorsky S-61	8	6	8
Vertol V-107-II	4	4	—
Bell BL-206	3	3	3
Piston-powered—total	3	3	3
Sikorsky S-58C	3	3	3

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

AEROSPACE FACTS AND FIGURES, 1972/73

U. S. MANUFACTURED AIRCRAFT IN OPERATION ON WORLD AIRLINES

Calendar Years 1965 to Date

	1965	1966	1967	1968	1969	1970
TOTAL, MANUFACTURED IN U. S. . . .	2,548	2,556	2,735	2,890	3,030	3,042
4 Engine	1,493	1,410	1,424	1,374	1,428	1,493
Turbojets	738	825	941	1,102	1,221	1,318
Boeing 707	291	365	467	547	600	604
Boeing 720/720B	119	118	121	119	113	101
Boeing 747	—	—	—	—	4	89
McDonnell Douglas DC-8	236	254	276	372	437	465
Convair 880	52	53	58	48	47	45
Convair 990	40	35	19	16	20	14
Turboprops	136	136	127	85	62	55
Lockheed Electra	136	133	124	82	59	51
Lockheed L-100 Hercules	—	3	3	3	3	4
Piston Engine	619	449	356	187	145	120
Lockheed Constellation	136	83	31	10	3	1
Douglas DC-7	85	47	23	5	3	1
Douglas DC-6	265	210	193	76	72	58
Douglas DC-4	132	109	109	96	67	60
Boeing Stratocruiser	1	—	—	—	—	—
3 Engine	193	309	441	561	671	713
Boeing 727 (turbojet)	193	309	441	561	671	713
2 Engine	803	791	836	925	902	815
Turbojets	4	59	176	392	498	547
Boeing 737	—	—	—	70	124	143
Lear Jet 24	—	—	—	1	1	—
McDonnell Douglas DC-9	4	59	176	324	373	404
Turboprops	7	18	28	34	26	24
Fairchild F-27/F-227	7	18	22	23	21	17
Convair 640/580	—	—	6	10	5	4
Other	—	—	—	1	—	3
Piston Engine	792	714	632	499	378	244
Convair 240, 340, 440	190	177	161	120	100	53
Martin 202, 404	4	—	—	—	—	—
Curtiss Commando C-46	57	56	44	23	18	7
Douglas DC-3/C-47	481	441	391	320	237	164
Other	60	40	36	36	23	20
1 Engine	21	13	10	12	14	4
Helicopters	38	33	24	18	15	17
ALL MANUFACTURERS						
GRAND TOTAL	3,461	3,541	3,725	3,903	3,999	3,983
Percent of Grand Total						
Manufactured in U. S.	73.6	72.2	73.4	74.0	75.8	76.4

NOTE: Excludes U.S.S.R. and People's Republic of China.

Source: International Air Transport Association, "World Air Transport Statistics" (Annually).
Based on reports by IATA members.

AIR TRANSPORTATION

U. S. DOMESTIC AND INTERNATIONAL AIRLINE PASSENGER SERVICE Selected Calendar Years, 1926 to Date

Year Ending Dec 31	Domestic		International	
	Passengers Carried (Thousands)	Revenue Passenger- Miles Flown (Millions)	Passengers Carried (Thousands)	Revenue Passenger- Miles Flown (Millions)
1926	6	1.3	N.A.	N.A.
1930	385	85.1	33	7.8
1935	679	281.2	111	46.7
1940	2,803	1,052.2	163	99.8
1945	6,541	3,360.3	511	450.1
1950	17,468	8,029.1	1,752	2,214.0
1951	22,711	10,589.7	2,140	2,613.8
1952	25,176	12,559.3	2,391	3,065.0
1953	28,901	14,793.9	2,745	3,450.8
1954	32,529	16,802.4	2,919	3,810.4
1955	38,221	19,852.1	3,488	3,398.9
1956	41,937	22,398.6	4,068	5,226.2
1957	45,162	25,378.8	4,259	5,882.0
1958	44,741	25,375.5	4,428	6,123.9
1959	51,000	29,307.6	4,999	7,064.2
1960	52,377	30,556.6	5,499	8,306.2
1961	52,712	31,062.3	5,699	8,768.5
1962	55,950	33,623.0	6,598	10,138.0
1963	63,925	38,456.6	7,513	11,905.4
1964	72,988	44,141.3	8,775	14,352.4
1965	84,460	51,887.4	10,195	16,789.0
1966	97,746	60,590.8	11,646	19,298.4
1967	118,669	75,487.3	13,424	23,259.3
1968	134,423	87,507.6	15,728	26,450.6
1969	142,340	95,945.8	16,848	29,468.3
1970*	153,662	104,146.8	16,260	27,563.2
1971	156,098	106,293.9	17,569	29,357.9

* Revised.

NOTE: Figures represent total scheduled services excluding nonrevenue operations of certificated route air carriers. Passenger originations only.

N.A.—Not available.

Source: Civil Aeronautics Board.

AEROSPACE FACTS AND FIGURES, 1972/73

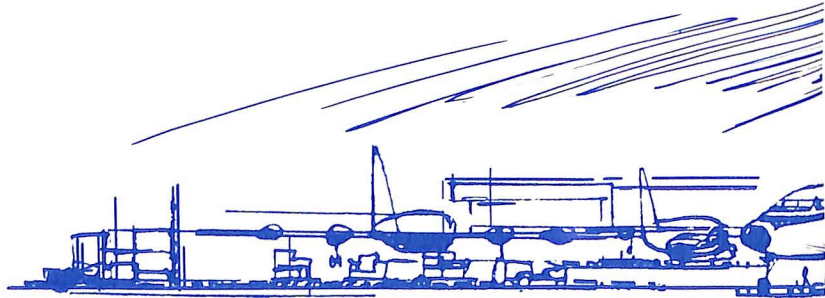
U. S. DOMESTIC AIRLINES
 TOTAL ASSETS AND NET INVESTMENT IN FLIGHT EQUIPMENT
 (Dollar Figures in Millions)
 1958 to Date

As of June 30	Total Assets ^a	Flight Equip- ment (Net-after depreciation)	Percent of Total Assets in Flight Equipment
1958	\$1,182	\$ 852	72.1%
1959	1,494	1,048	70.1
1960	1,760	1,374	78.1
1961	2,099	1,734	82.6
1962	2,273	1,874	82.4
1963	2,211	1,818	82.2
1964	2,415	2,030	84.0
1965	2,816	2,391	84.9
1966	3,747	2,981	79.6
1967	5,003	3,833	76.6
1968	6,294	5,096	76.6
1969	7,107	5,864	82.5
1970	7,417	6,030	81.3
1971	7,664	6,347	82.8

^a Comprises net investment in buildings and ground equipment, flight equipment, working capital, etc.

NOTE: Includes data for system trunk and local service carriers only.

Sources: Civil Aeronautics Board 1964 "Annual Report." Civil Aeronautics Board, Accounting Costs and Statistics Division.

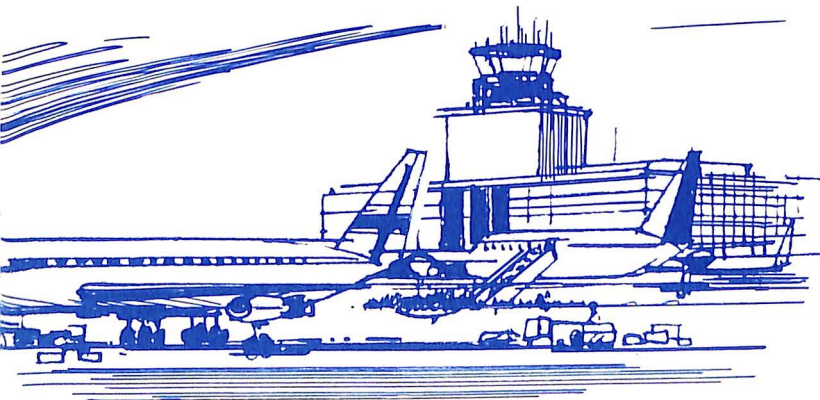


AIR TRANSPORTATION

U. S. DOMESTIC AIRLINES, VALUE OF FLIGHT EQUIPMENT^a 1958 to Date (Millions of Dollars)

As of June 30	Total Gross Value of Flight Equipment	Less: Depreciation	Plus: Construction Work in Process	Equals: Net Value of Flight Equipment
1958	\$1,498.5	\$ 709.8	\$ 63.4	\$ 852.1
1959	1,752.8	816.8	112.3	1,048.3
1960	2,174.3	889.6	89.5	1,374.2
1961	2,719.2	1,062.0	76.7	1,733.9
1962	3,006.0	1,183.3	51.7	1,874.4
1963	3,132.4	1,341.4	27.1	1,818.1
1964	3,382.7	1,401.6	48.4	2,029.5
1965	3,843.5	1,504.7	51.7	2,390.5
1966	4,519.7	1,645.5	106.9	2,981.1
1967	5,485.0	1,805.6	153.2	3,832.6
1968	6,936.2	2,043.7	203.7	5,096.2
1969	8,003.5	2,334.2	194.6	5,863.8
1970	8,546.3	2,813.9	297.9	6,030.3
1971	9,375.2	3,231.0	203.0	6,347.2

^a Includes data for system trunk and local service carriers only.
Source: Civil Aeronautics Board, Accounting Costs and Statistics Division.



AEROSPACE FACTS AND FIGURES, 1972/73

OPERATING REVENUES OF SCHEDULED DOMESTIC PASSENGER/CARGO OPERATORS CERTIFICATED ROUTE AIR CARRIERS^a Calendar Years 1957 to Date (Millions of Dollars)

Calendar Years	Total Operating Revenues	Passenger	Mail (in- cluding subsidy)	Express and Freight	Excess Baggage	Other
1957	\$1,530	\$1,347	\$ 75	\$ 68	\$ 19	\$ 21
1958	1,636	1,432	82	78	19	25
1959	1,955	1,723	95	91	21	25
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

^a Includes Intra-Alaska, Intra-Hawaii, Helicopter and other carriers.
Source: Civil Aeronautics Board, Bureau of Accounts and Statistics.

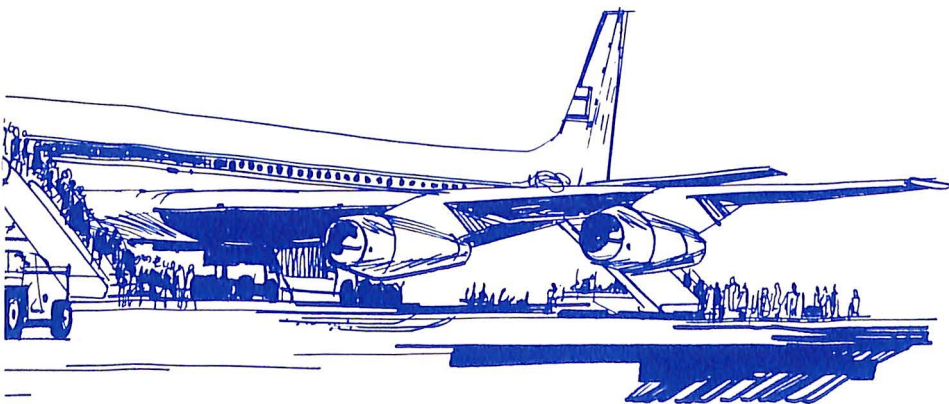


AIR TRANSPORTATION

OPERATING REVENUES, EXPENSES AND NET OPERATING INCOME OF SCHEDULED DOMESTIC PASSENGER/CARGO OPERATORS AND CERTIFICATED AIR CARRIERS^a Calendar Years 1957 to Date (Millions of Dollars)

Calendar Years	Total Operating Revenues	Total Operating Expense	Net Operating Income
1957	\$1,530	\$1,489	\$ 41
1958	1,636	1,539	97
1959	1,955	1,848	107
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

^a Includes Intra-Alaska, Intra-Hawaii, Helicopter and other carriers.
NOTE: Figures before 1961 do not include items of ground and indirect expense.
Source: Civil Aeronautics Board, Bureau of Accounts and Statistics.



AEROSPACE FACTS AND FIGURES, 1972/73

U. S. CIVIL AND JOINT-USE AIRPORTS
By Length of Runway and Region^a
January 1, 1971

FAA Region	TOTAL	Airports by Length of Runway (in feet)		
		Under 5,000	5,000- 9,999	10,000 & over
TOTAL	11,261	9,807	1,208	246
New England	445	366	57	22
Eastern	1,418	1,285	107	26
Great Lakes	2,048	1,870	144	34
Central	1,051	983	59	9
Southern ^b	1,297	1,107	177	13
Southwest	1,704	1,490	184	30
Rocky Mountain	846	707	134	5
Western	1,047	880	149	18
Northwestern	627	539	76	12
Alaskan	708	526	107	75
Pacific	59	52	6	1
Outside U.S. ^c	11	2	8	1

^a Includes seaplane bases, heliports and military fields having joint-civil use.

^b Includes Puerto Rico (20 airports) and the Virgin Islands (4 airports.)

^c American Samoa, Canton, Guam and Wake.

Source: Department of Transportation, Federal Aviation Administration.

AIR TRANSPORTATION

ACTIVE AIRMAN CERTIFICATES HELD 1955 to Date

Year as of Jan. 1	Pilots						Non- pilots	Other
	TOTAL	Stu- dents	Private	Com- mercial	Airline	Other		
1955	349,729	71,969	184,595	80,346	12,129	690	140,199	64,263
1956	298,076	80,494	132,525	72,957	11,774	326	148,335	71,307
1957	259,567	96,124	96,864	54,545	11,173	861	155,121	62,927
1958	309,212	98,498	124,799	70,813	13,964	1,138	149,274	74,682
1959	354,365	103,456	140,573	93,126	15,840	1,370	157,424	88,079
1960	359,875	107,815	139,804	93,815	16,950	1,491	167,074	91,259
1961	348,062	99,182	138,869	89,904	18,279	1,828	169,598	94,723
1962	352,860 ^E	93,973	144,312 ^E	92,976 ^E	19,155 ^E	2,444 ^E	175,287 ^E	98,257 ^E
1963	365,971	95,870	149,755	96,047	20,032	4,267	181,982	101,793
1964	378,700	105,298	152,209	96,341	20,269	4,583	186,304	83,800
1965	431,041	120,743	175,574	108,428	21,572	4,724	195,396	116,600
1966	479,770	139,172	196,393	116,665	22,440	5,100	204,463	128,541
1967	548,757	165,177	222,427	131,539	23,917	5,697	217,132	146,068
1968	617,931	181,287	254,069	150,135	25,817	6,623	231,801	166,994
1969	691,695	209,406	281,728 ^a	164,458	28,607	7,496	250,151	169,707
1970	720,028	203,520	299,491	176,585	31,442	8,990	269,775	189,871
1971	732,729	195,861	298,627	186,821	34,430	16,990	289,681	207,670
1972	741,009	186,428	312,656	192,409	35,949	13,567	307,057	217,021

^E Estimate.

^a Includes special certificates issued to foreign nationals.

Source: Federal Aviation Administration, Office of Management Systems.

AEROSPACE FACTS AND FIGURES, 1972/73

GENERAL AVIATION, HOURS, AND MILES FLOWN, BY TYPE OF FLYING
Calendar Years 1931 to Date

Year Ending Decem- ber 31	Total	Business		Commercial		Instructional		Personal		Other	
		Units	Per Cent	Units	Per Cent	Units	Per Cent	Units	Per Cent	Units	Per Cent
ESTIMATED HOURS FLOWN, Thousands											
1931	1,083	152	14	281	26	307	28	343	32	—	—
1936	1,059	122	12	245	23	380	36	312	29	—	—
1941	4,460	250	6	511	11	2,816	63	883	20	—	—
1946	9,788	1,068	11	943	10	5,996	61	1,686	17	95	1
1951	8,451	2,950	35	1,584	19	1,902	23	1,880	22	135	1
1953	8,527	3,626	42	1,649	19	1,248	15	1,846	22	158	2
1955	9,500	4,300	45	1,950	21	1,275	13	1,975	21	—	—
1957	10,938	4,864	45	2,013	18	1,864	17	2,109	19	88	1
1959	12,903	5,699	44	2,365	18	2,043	16	2,796	22	—	—
1960	13,121	5,699	44	2,365	18	1,828	14	3,172	24	57	a
1961	13,602	5,699	42	2,634	19	1,796	13	3,398	25	75	1
1962	14,500	5,431	38	3,051	21	2,385	16	3,489	24	144	1
1963	15,106	5,740	38	3,172	21	2,417	16	3,626	24	151	1
1964	15,738	5,823	37	3,305	21	2,675	17	3,777	24	156	1
1965	16,733	5,857	35	3,348	20	3,346	20	4,016	24	166	1
1966	21,023	7,057	33	3,555	17	5,674	27	4,540	22	197	1
1967	22,153	6,578	30	3,918	18	6,262	28	5,173	23	222	1
1968	24,053	6,976	29	4,810	20	6,494	27	5,532	23	241	1
1969	25,351	7,064	28	4,928	19	7,023	28	5,999	24	337	1
1970	26,030	7,182	28	6,657	25	4,722	18	6,936	27	533	2
ESTIMATED MILES FLOWN, Millions											
1931	94	13	14	26	28	25	27	29	31	—	—
1936	93	12	13	25	26	30	33	27	28	—	—
1941	346	27	8	51	15	197	57	71	20	—	—
1946	875	122	14	108	12	479	55	157	18	10	1
1951	975	380	39	190	20	190	19	200	21	15	1
1953	1,045	499	48	210	20	121	11	196	19	19	2
1955	1,216	628	52	246	20	121	10	222	18	—	—
1957	1,426	721	51	249	17	202	14	241	17	13	1
1959	1,716	858	50	292	17	223	13	243	20	—	—
1960	1,769	881	50	299	17	194	11	387	22	8	a
1961	1,858	888	48	333	18	203	11	425	23	9	a
1962	1,965	935	48	367	18	256	13	388	20	20	1
1963	2,049	983	48	369	18	266	13	410	20	20	1
1964	2,181	1,047	48	393	18	284	13	436	20	22	1
1965	2,562	1,204	47	461	18	359	14	512	20	26	1
1966	3,336	1,546	46	516	16	646	19	606	18	32	1
1967	3,440	1,431	42	569	16	713	21	691	20	36	1
1968	3,701	1,406	38	666	18	814	22	777	21	37	1
1969	3,926	1,426	36	723	19	910	23	829	21	38	1
1970	3,207	1,136	35	773	24	467	15	755	24	76	2

^a Less than 0.5 percent.

Source: Federal Aviation Administration, "General Aviation Statistics."

AIR TRANSPORTATION

ACTIVE CIVIL AIRCRAFT BY TYPE Calendar Years 1954 to Date

Year Jan. 1	Active Civil Aircraft								
	TOTAL	Total Air Carrier ^a	General Aviation Aircraft					Rotor- craft ^b	Other ^c
			TOTAL	Fixed-Wing Aircraft		Rotor- craft ^b	Other ^c		
				Multi- engine	Single-Engine				
					4-place & over	3-place & less			
1954	55,505	1,615	53,890	N.A.	N.A.	N.A.	N.A.	N.A.	
1955	58,994	1,606	57,388	2,600	17,078	37,278	235	197	
1956	60,432	1,642	58,790	3,342	19,240	35,654	283	271	
1957	64,638	1,802	62,886	4,183	22,805	35,291	350	257	
1958	67,153	1,864	65,289	5,036	23,751	35,809	433	260	
1959	69,718	1,879	67,839	5,416	26,170	35,440	521	292	
1960 ^d	70,747	2,020	68,727	6,034	27,301	34,543	525	324	
1961	78,760	2,211	76,549	7,243	34,829	33,472	634	361	
1962	82,853	2,221	80,632	8,401	38,206	32,800	798	427	
1963	86,287	2,166	84,121	9,186	41,120	32,341	967	507	
1964	87,267	2,179	85,088	9,695	42,657	30,977	1,171	588	
1965	90,935	2,193	88,742	10,644	45,777	30,367	1,306	648	
1966	97,741	2,299	95,442	11,977	49,789	31,364	1,503	809	
1967	107,085	2,379	104,706	13,548	52,972	35,687	1,622	877	
1968	116,781	2,595	114,186	14,651	56,865	39,675	1,899	1,096	
1969	127,164	2,927	124,237	16,760	60,977	42,830	2,350	1,320	
1970	133,814	3,008	130,806	18,111	63,703	45,001	2,557	1,434	
1971	134,086	2,679	131,407	18,276	109,333		2,247	1,551	

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.

N.A.—Not available.

^a Registered, not necessarily in operation. Includes helicopters.

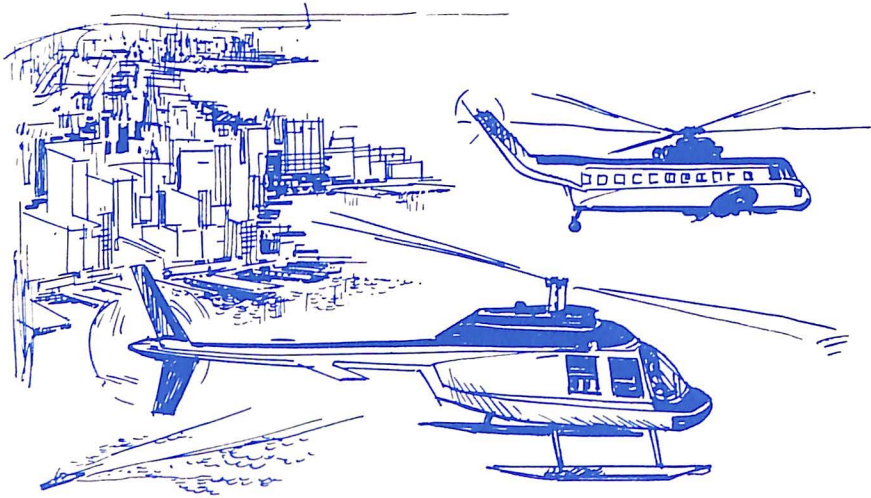
^b Includes autogiros; excludes air carrier helicopters.

^c Includes gliders, dirigibles, and balloons.

^d Excludes approximately 4,000 unclassified active aircraft.

Source: Federal Aviation Administration, "U.S. Active Civil Aircraft by State and County."

VERTICAL LIFT AIRCRAFT



Helicopters are big business as shown in the continued growth in the civil use of rotary wing aircraft. There are 1,520 operators using 4,233 helicopters.

The 1972 directory survey showed an increase of 5 percent in the number of helicopter operators and 8 percent in the number of helicopters operated, compared with the 1971 totals.

The largest increase in operators—13 percent—was in the number of commercial helicopter operators. These companies also showed the largest increase in the number of helicopters operated—an increase of 15 percent over the 1971 total.

Based on available information today law enforcement agencies in more than 65 U.S. cities and 20 states operate helicopters for traffic patrol, crime control, search and rescue.

As a public service, for the first time, *The 1972 Directory of Helicopter Operators—Commercial—Executive—Civil Government and Helicopter Flight Schools* was compiled jointly by AIA and *Rotor & Wing* magazine. The Directory will be published simultaneously in the annual AIA book format and in the June/July issue of the magazine.

The 1972 AIA Directory of Heliports/Helistops in the U.S., Canada and Puerto Rico lists 2,310 facilities. Of these only 602 are for public use. Establishment of needed city-center and suburban public heliports would not only permit convenient short-haul commuter transportation, but serve to lessen airport and highway congestion.

AIR TRANSPORTATION

In addition to the listed facilities, there are more than 1,000 oil rig heliports in the Gulf of Mexico, and the U.S. Forest Service maintains 300 heliports and more than 5,000 unimproved heliports around the country.

In 1965, there were 34 hospital heliports in the country. Today, 330 hospitals provide landing facilities for the helicopter ambulance—the medicopter—to transport medical emergency cases and highway accident victims to a hospital as well as to transfer patients from community hospitals to medical centers for specialized care.

HELICOPTER SCHEDULED AIRLINES Available Service and Utilization Calendar Years 1952 to Date (In Thousands)

Year Ending Dec. 31	Passengers Carried	Revenue Ton-Miles Flown	Revenue Passenger- Miles Flown	Revenue Plane-Miles Flown
1952	—	75	—	632
1953	1	127	26	1,007
1954	8	151	183	1,074
1955	29	193	628	1,152
1956	64	281	1,585	1,318
1957	153	449	3,275	1,604
1958	230	594	4,885	1,675
1959	366	856	7,477	1,899
1960	430	1,054	9,475	2,219
1961	490	963	8,604	2,157
1962	359	897	8,192	1,518
1963	458	1,317	12,510	1,462
1964	608	1,668	16,003	1,976
1965	718	1,948	18,811	1,984
1966	1,067	2,562	25,420	2,241
1967	1,220	2,960	29,670	2,660
1968	1,042	2,482	24,856	2,547
1969	737	1,703	17,074	1,909
1970	573	1,167	11,341	1,427
1971	551	917	8,973	1,048

Source: Civil Aeronautics Board.

AEROSPACE FACTS AND FIGURES, 1972/73

HELICOPTER SCHEDULED AIRLINES
Revenue Ton-Mile Traffic Carried
Calendar Years 1952 to Date
(In Thousands)

Year Ending Dec. 31	TOTAL TON-MILES	Passenger	U. S. Mail	Express	Freight	Excess Baggage
1952	75	—	75	—	—	—
1953	127	2	125	—	2	—
1954	151	18	116	13	4	—
1955	193	59	97	32	5	—
1956	281	146	91	36	7	1
1957	449	314	91	34	7	3
1958	594	468	84	33	6	3
1959	856	717	87	41	7	4
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

^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.

Source: Civil Aeronautics Board.

AIR TRANSPORTATION

HELIPORTS AND HELISTOPS IN THE UNITED STATES, CANADA, AND PUERTO RICO 1965 to Date

Region	1965	1966	1968	1970	1972
TOTAL	1,118	1,225	1,892	2,310	2,310
(elevated)	(95)	(125)	(158)	(216)	(197)
New England	88	93	138	93	91
Middle Atlantic	179	203	346	514	585
East North Central	122	139	258	293	272
West North Central	47	43	81	107	124
South Atlantic	97	105	157	192	196
East South Central	25	28	41	47	64
West South Central	116	118	195	205	212
Mountain	78	92	126	157	164
Pacific	320	358	470	593	503
Other	46	46	80	109	99

NOTE: Data for 1967, 1969 and 1971 are not available. Totals include proposed facilities.
Source: Aerospace Industries Association.

HOSPITAL HELIPORTS IN THE UNITED STATES, BY REGION 1967 to Date

Region	1967	1968	1969	1970	1972
TOTAL	88	147	161	285	330
New England	2	2	2	5	5
Middle Atlantic	10	19	22	29	32
East North Central	14	50	52	74	66
West North Central	2	4	4	18	22
South Atlantic	16	19	24	33	39
East South Central	1	1	1	5	19
West South Central	16	16	17	20	27
Mountain	8	9	11	24	30
Pacific	19	27	28	73	86
Other	—	—	—	4	4

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

AEROSPACE FACTS AND FIGURES, 1972/73

CIVIL HELICOPTER OPERATORS AND HELICOPTERS OPERATED
1960 to Date

Year as of February 1	TOTAL Number	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
HELICOPTERS OPERATED				
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

NOTE: Includes United States and Canada.

^a Federal, state and local governments.

Source: Aerospace Industries Association, manufacturers' and owner/operators' reports.

Glossary

- Accessions:** new hires and rehires by industrial employer. Cumulated for a calendar month or year and expressed as a rate per 100 employees on the payroll.
- 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., an association of major aerospace industry contractors and subcontractors.
- Air Carriers:** see Airlines.
- 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, guided missiles and lighter-than-air craft.
- 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. Part 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:** the commercial system of air transportation. Consists of scheduled domestic and (U.S.) international air carriers, supplemental and other carriers.
- Airplane:** see Aircraft.
- Appropriation (Federal Budget):** an act of Congress authorizing an agency to incur obligations and make payments out of funds held by the Treasury.
- Astronautics:** the art and science of designing, building and operating manned or unmanned objects through space.
- Backlog:** the sales value of orders accepted (supported by legal documents) that have not yet passed through the sales account.
- Budget Authority (Federal Budget):** authority provided by the Congress, mainly in the form of appropriations, which allows Federal agencies to incur obligations to spend or lend money; composed of “New Obligational Authority” plus “Loan Authority.”
- Development:** the process or activity of working out a basic design, idea or piece of equipment (see also Research).

DOD: Department of Defense.

Earnings: see Net Income.

Evaluation: determination of technical suitability of material, equipment, or a system.

Expenditures (Federal Budget): the portion of the budget consisting of budget receipts and budget authority and outlays for all non-lending programs, lending programs not classified in the loan account and the administrative and other net expenses of programs in the loan account.

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): from July 1 to June 30, and designated by the calendar year in which it ends.

Funding: setting aside funds for a particular purpose.

FY: see Fiscal Year.

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

Helicopter: a heavier-than-air aircraft supported in the air by power driven rotors about one or more substantially vertical axes.

Heliport: an area either at ground level or elevated on a structure, that is used for the landing and takeoff of helicopters.

ICBM: Intercontinental Ballistic Missile, range more than 5,000 miles.

Labor Turnover: the gross movement of wage and salary workers into and out of employment in individual manufacturing establishments, cumulated for a calendar month or year and expressed as a rate per 100 employees on the payroll.

Loan Authority (Federal Budget): authority to incur obligations for loans made under programs classified in the loan account.

Military Assistance: see Mutual Security Program.

Mutual Security Program: a program of the U. S. Government designed to maintain the 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.

Net Income: profit after depreciation, taxes and reserves for taxes, chargeoffs, other reserves, etc., but before dividends; also identified as earnings or net earnings.

Net Lending (Federal Budget): gross loan disbursements minus repayments in the loan account.

GLOSSARY

- New Obligational Authority (Federal Budget):** authority provided by the congress to obligate the Federal government to pay out money. While usually voted each year, it may become available annually under a permanent law, as with interest on the public debt. "Appropriations" are the most common form of obligational authority.
- 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 the budget authority.
- Outlays (Federal Budget):** checks issued, interest accrued on the public debt, or other payments made, net of refunds and reimbursements. Budget outlays are composed of "expenditures" plus "net lending."
- Passenger Mile:** one passenger moved one mile.
- Procurement:** the process whereby Federal government agencies acquire material, services and property from industry.
- Profit:** see Net Income.
- QUESTOL:** quiet experimental short takeoff landing aircraft.
- R & D:** research and development.
- RDT&E:** research, development, test and evaluation.
- Research:** "basic research" provides new knowledge and understanding; "applied research" puts the knowledge gained in basic research to some useful purpose.
- 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.
- 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:** terminations of employment. Terminations may be initiated by the employee (quits) or the employer (layoff, other separations). Both employee and employer actions are accumulated for a calendar month or year and are expressed as a rate per 100 employees on the payroll.
- SST:** supersonic transport.
- STOL:** short takeoff and landing aircraft.
- STOLport:** short takeoff and landing airport, 2,000 feet.
- Test:** an experiment designed to assess progress in attainment or accomplishment of development objectives.
- 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.

Turbine, Turbo: a mechanical device or engine that spins in reaction to a gaseous flow that passes through or over it. Frequently used in "turbo-prop" and "turbo-jet."

U. K.: United Kingdom.

U. S.: United States.

USA: United States Army.

USAF: United States Air Force.

USCG: United States Coast Guard.

USN: United States Navy.

USSR: Union of Soviet Socialist Republics.

Utility Aircraft: an aircraft designed for general purpose work.

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

VTOL: vertical takeoff and landing aircraft.

V-port: city-center or suburban ground-level or rooftop landing facility for vertical takeoff and landing aircraft.

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