



AEROSPACE FACTS AND FIGURES

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AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

1971/72



AEROSPACE FACTS AND FIGURES

COMPILED BY THE OFFICE OF PUBLIC AFFAIRS

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AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

FOREWORD

Major areas of activities in the aerospace industry continued their predicted decline during 1970.

However, sales volume in 1970 was the fourth largest in the industry's history and there are firm indications that the downward curve will be reversed.

Basic economic measurements of the industry in 1970 include:

- Sales in 1970 dropped to \$24.8 billion compared with \$26.1 billion in 1969 with most of the decline in sales of military aircraft and space vehicles.

- Average employment fell from 1,354,000 persons in 1969 to 1,159,000 in 1970, and the decline has continued into 1971. Nevertheless, the aerospace industry remained the nation's largest manufacturing employer.

- Erosion continued in aerospace profits (as a percentage of sales after taxes) with 2.0 percent reported in 1970 compared with 3.1 percent in 1969. The 1970 aerospace profit ratio compares with 4.0 percent for all manufacturing industries.

- Backlog of the industry dropped approximately \$3.5 billion in 1970 from \$28.3 billion reported at the end of 1969.

- Aerospace exports were a major factor in maintaining the nation's precarious balance of trade during 1970. For the seventh consecutive year, aerospace exports increased, rising from \$3.1 billion in 1969 to a new record of \$3.4 billion. The past year also marked the fourteenth consecutive year that aerospace exports have exceeded \$1 billion.

The firm indications of an upturn in aerospace activities include:



- Space sales for 1970, which dropped from \$4.3 billion in 1969 to \$3.6 billion in 1970, were largely due to the virtual completion of the hardware phase of the Apollo program. However, the space shuttle program, a major step forward in economic space exploration, and the Earth resources program for unmanned satellites, are moving ahead.

- Nonaerospace sales, which remained virtually the same over the 1969-70 period, are expected to increase as the advanced technology generated by the aerospace industry enters an application phase to domestic and social problems. The industry is already heavily involved in transportation hardware work for the Urban Mass Transportation Administration. The broadening development of a marketplace for aerospace technology in socio-economic fields appears promising.

- Obligational authority for aerospace products from two major customers—DoD and NASA—are estimated to increase \$1 billion in Fiscal Year 1972 (compared with FY 1971) to a total of approximately \$18 billion.

This 1971/72 edition of *Aerospace Facts and Figures* represents an effort by the Aerospace Industries Association to furnish an insight into the basic economics of the industry. The industry's record in such fields as research, development, test and evaluation and production of its diverse products is reported.

This nineteenth edition is aimed at serving as a standard reference work for administrators and managers in Government and industry, writers and editors, legislators and analysts and students.

KARL G. HARR, JR.
President
Aerospace Industries Association

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Aerospace Summary



Sales of the aerospace industry continued the predicted decline in 1970, dropping to approximately \$24.8 billion compared with \$26.1 billion in 1969. A sales peak of \$29 billion was achieved in 1968.

Bulk of the sales decline was in aircraft and space vehicle sales. Missile sales in 1970 registered an increase of about \$300 million over 1969.

Sales to the Department of Defense declined more than \$1 billion while sales to the National Aeronautics and Space Administration dropped \$350 million. Non-government sales gained approximately \$235 million over 1969 and non-aerospace remained at the same level.

Backlog of the industry dropped to \$24.8 billion in 1970 from \$28.3 billion in 1969. This is a decline of approximately \$6 billion from the peak backlog of nearly \$31 billion. The backlog reported for 1970 breaks

down to \$13.1 billion in U.S. Government orders and \$11.7 billion in other orders, principally civil aircraft.

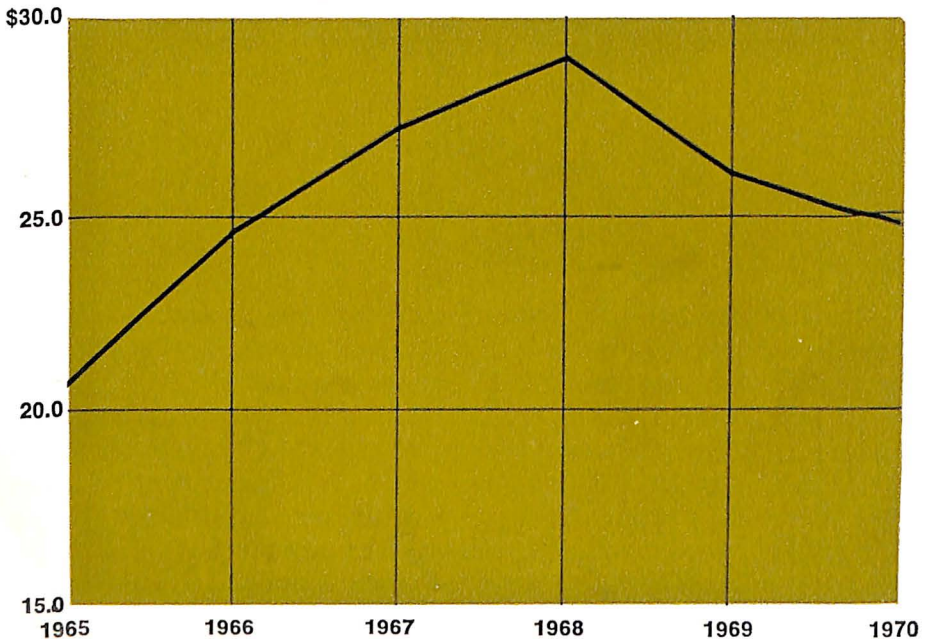
Aerospace expenditures by the Department of Defense are estimated at \$13.9 billion for Fiscal Year 1972 which compares with approximately \$14 billion in FY 1971.

Obligational authority for aerospace products and services for both DoD and NASA for FY 1972 are estimated at nearly \$18 billion, an increase of \$1 billion over the FY 1971 estimate.

Average employment for the aerospace industry during 1970 was down to 1,159,000 workers compared with 1,354,000 in the previous year. Average employment in all manufacturing industries for 1970 was 19,393,000 compared with 20,169,000 in 1969.

Exports continued to be a bright spot in the aerospace business picture. A new high of \$3.4 billion in exports was reached during 1970. This compares with \$3.1 billion in 1969 and marks the fourteenth year that exports have exceeded \$1 billion.

AEROSPACE SALES
(IN BILLIONS OF DOLLARS)



SOURCE: AEROSPACE INDUSTRIES ASSOCIATION

AEROSPACE SUMMARY

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

Year Ending December 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	865.0 ^r	603.7	331.0	29.0 ^r	3.4	4.8	8.8
1969	931.4 ^r	655.6	363.7	26.1 ^r	2.8	4.0	7.2
1970	976.5	665.7	361.7	24.8	2.5	3.7	6.9

^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: Manufacturing and Durable Goods Industries; Department of Commerce, Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders, Series M-3" (Monthly). Gross National Product; Department of Commerce, "Survey of Current Business," (Monthly). Aerospace: Aerospace Industries Association estimates, based on latest available information.

During 1969, the International Air Transport Association reported that there were 3,999 aircraft in operation on world civil airlines, and 75 percent of them were manufactured in the U.S.

The profits of the aerospace industry (as a percentage of sales after taxes) continued to decline. In 1970, the percentage was 2.0 compared with 3.1 in 1969. The profit percentage for all manufacturing corporations, measured by the same formula, was 4.0 percent in 1970.

AEROSPACE FACTS AND FIGURES, 1971/72

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- government	
		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 ^r	28,959	16,573	3,920	5,917	2,549
1969 ^r	26,126	15,771	3,314	4,342	2,699
1970	24,848	14,642	2,952	4,578	2,676

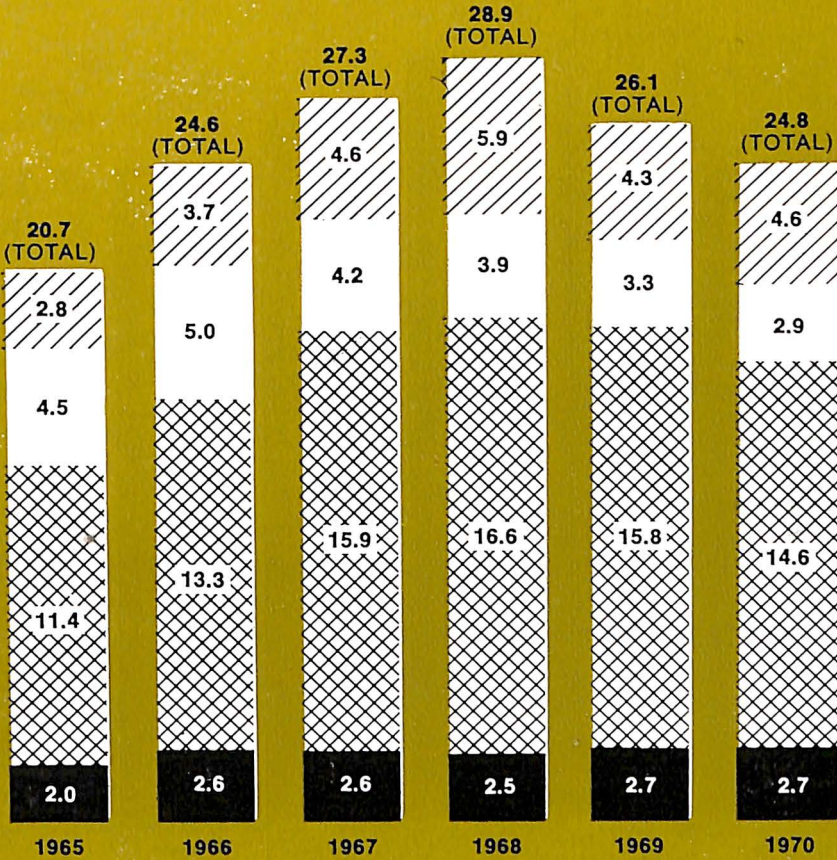
^r Revised.





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

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

AEROSPACE SUMMARY

AEROSPACE SALES BY CUSTOMER
(IN BILLIONS OF DOLLARS)



 **COMMERCIAL**
 **NASA AND OTHER GOVERNMENT**
 **DEPARTMENT OF DEFENSE**
 **NON-AEROSPACE**

SOURCE: AEROSPACE INDUSTRIES ASSOCIATION

AEROSPACE FACTS AND FIGURES, 1971/72

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 ^r	28,959	16,578	4,719	5,113	2,549
1969 ^r	26,126	14,097	5,058	4,272	2,699
1970	24,848	13,232	5,375	3,565	2,676

^rRevised

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

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

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	17,750	12,972	20,628 ^a		5,704	1,712	917	1,761
1968	30,749	16,343	14,406	8,150	12,409	5,083	1,851	983	2,273
1969	28,298	14,302	13,996	7,090	12,098	4,337	2,002	880	1,891
1970	24,770	13,080	11,690	6,022	9,676	4,491	2,031	789	1,761

^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.

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)

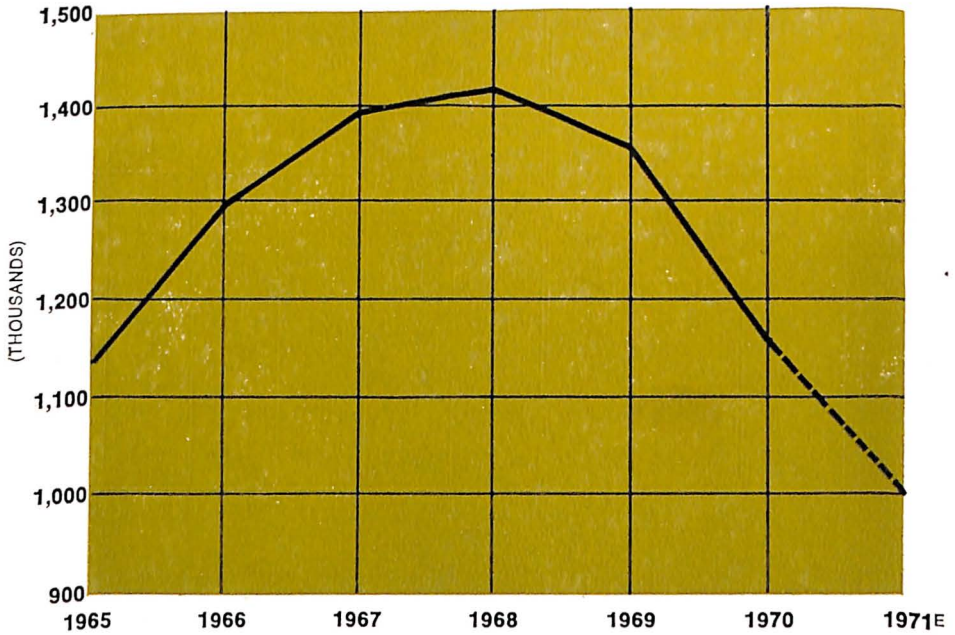
Year ending De- cember 31	GRAND TOTAL	TOTAL		Aircraft and Engines		Mis- siles & Space Incl. Propul- sion	Other Aerospace		Non- aero- space
		U.S. Govt.	Other	U.S. Govt.	Other		U.S. Govt.	Other	
1960	\$10,977	N.A.	N.A.	\$4,246	\$2,183	N.A.	N.A.	N.A.	\$4,568
1961	14,948	\$11,766	\$3,182	3,967	1,888	\$5,187	\$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	1,413	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 ^r	24,648	16,560	8,088	7,161	5,103	5,660	2,539	986	2,699
1970	24,976	16,596	8,380	7,654	5,890	5,486	2,349	921	2,676

^r Revised.

N.A.—Not available.

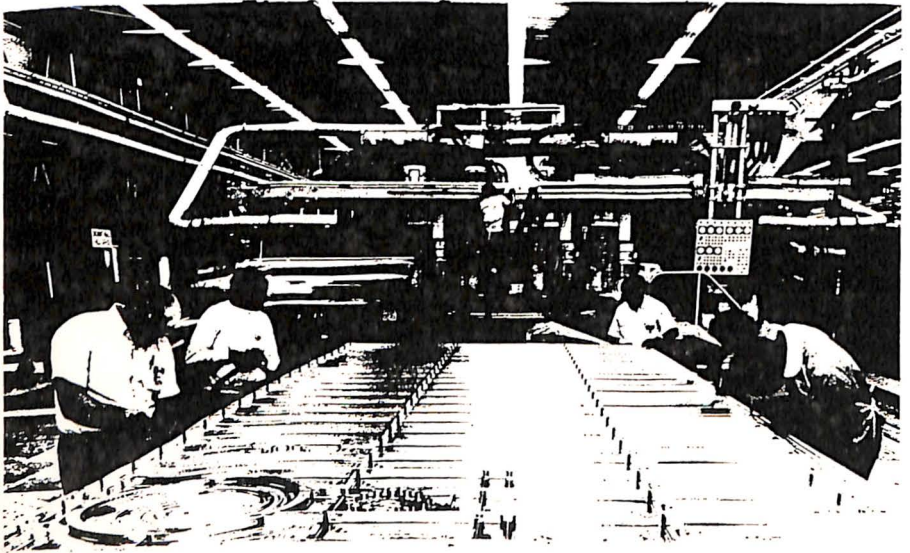
Source: Bureau of the Census, "Current Industrial Reports, Series MQ37D", (Quarterly). Based on information from about 55 aerospace companies. Includes some duplication because of subcontracting between aerospace companies.

AEROSPACE EMPLOYMENT (ANNUAL AVERAGE)



E — Estimated

SOURCE: AEROSPACE INDUSTRIES ASSOCIATION



AEROSPACE SUMMARY

EMPLOYMENT IN ALL MANUFACTURING, DURABLE GOODS, AND AEROSPACE INDUSTRIES Calendar Years 1960 to Date (Thousands of Employees)

Annual Average	All Manu- facturing Industries	Durable Goods Industries	AEROSPACE INDUSTRY		
			TOTAL	As Percent of	
				Manufac- turing	Durable Goods
1960	16,796	9,459	1,074	6.1	10.8
1961	16,326	9,070	1,096	6.7	12.1
1962	16,853	9,480	1,177	7.0	12.4
1963	16,995	9,616	1,174	6.9	12.2
1964	17,274	9,816	1,117	6.5	11.4
1965	18,032	10,386	1,133	6.3	10.9
1966	19,081	11,186	1,298	6.8	11.6
1967	19,339	11,327	1,392	7.2	12.3
1968	19,740	11,578	1,418	7.2	12.2
1969	20,169 ^r	11,893 ^r	1,354	6.7	11.4
1970	19,393	11,203	1,159	6.0	10.3

^r Revised.

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, 1971/72

ESTIMATED EMPLOYMENT AND PAYROLL IN THE AEROSPACE INDUSTRY Calendar Years 1959 to Date

Year Ending Decem- ber 31	Annual Average Aerospace Employment			Aerospace Payroll			Aerospace as Percent of Total	
	TOTAL (Thousands of Employees)	Sala- ried Worker	Produc- tion Worker	TOTAL (Millions of Dollars)	Sala- ried Worker	Produc- tion Worker	Manu- factur- ing Em- plov- ment	Manu- factur- ing Pay- roll
1959	1,128	455	673	\$7,427	\$3,692	\$3,735	6.8%	8.5%
1960	1,074	467	607	7,317	3,835	3,482	6.1	8.2
1961	1,096	499	597	7,809	4,257	3,552	6.7	8.7
1962	1,177	558	619	8,889	5,045	3,844	7.0	9.2
1963	1,174	594	580	9,102	5,421	3,681	6.9	9.0
1964	1,117	565	552	8,897	5,326	3,571	6.5	8.3
1965	1,133	562	571	9,502	5,429	4,073	6.3	8.2
1966	1,298	612	686	11,394	6,220	5,174	6.8	8.9
1967	1,392	645	747	12,659	6,860	5,779	7.2	9.4
1968	1,418	664	754	13,748	7,728	6,020	7.2	9.5
1969	1,354	657	697	14,150	8,189	5,961	6.7	9.0
1970	1,159	581	578	12,834	7,666	5,168	6.0	8.1

Sources: Manufacturing Employment: Bureau of Labor Statistics, "Employment and Earnings" (Monthly). Manufacturing Payroll: Bureau of Employment Security-Office of Business Economics estimates. Aerospace Employment and Payroll: Aerospace Industries Association Estimates, based on latest available information.

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. Merchandise	Exports of Aerospace Products				
		TOTAL	Civil		Military	Percent of Total U.S. Exports
			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 ^r	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 ^r	147	\$ 456	\$ 713	7.4
1959	17,451 ^r	1,059 ^r	108	394	557	6.3
1960	20,375 ^r	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 ^r	37,332	3,138	947	1,080	1,111	8.4
1970	42,662	3,400	1,295	1,213	892	8.0

^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).

AEROSPACE FACTS AND FIGURES, 1971/72



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	3.1
1970	4.0	4.5	3.6	2.0

Source: Securities & Exchange Commission—Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations."

AEROSPACE SUMMARY

FEDERAL OUTLAYS FOR SELECTED FUNCTIONS AND FOR AEROSPACE PRODUCTS AND SERVICES Fiscal Years, 1948 to Date

Year Ending June 30	Federal Outlays (Millions of Dollars)			AEROSPACE as Percent of Total National Defense and NASA
	Total National Defense	NASA AEROSPACE	Total AEROSPACE Products and Services	
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	^a 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 ^r	80,516	4,724	21,353	25.1
1969 ^r	81,240	4,251	20,472	23.9
1970	80,295	3,753	18,747	22.3
1971 ^E	76,443	3,369	17,270	21.6
1972 ^E	77,512	3,152	16,875	20.9

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

N.A.—Not available.

^r Revised.

^E Estimate.

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

AEROSPACE FACTS AND FIGURES, 1971/72

DEPARTMENT OF DEFENSE
 TOTAL EXPENDITURES BY APPROPRIATION GROUP
 Fiscal Years, 1964 to Date
 (Millions of Dollars)

	Year Ending June 30	
	1964 ^r	1965 ^r
TOTAL	\$50,786	\$47,098
PROCUREMENT	15,351	11,839
AIRCRAFT	6,053	5,200
MISSILES	3,577	2,096
Ships	2,078	1,713
Combat Vehicles, Weapons & Torpedoes	^a	^a
Ordnance, Vehicles, & Related Equipment	1,597	1,041
Electronics and Communications	1,264	897
Other procurement	782	893
RESEARCH, DEVELOPMENT, TEST AND EVALUATION	7,021	6,236
AIRCRAFT	939	1,017
MISSILES	2,352	1,901
ASTRONAUTICS	1,284	921
Other	2,446	2,397
MILITARY ASSISTANCE	1,485	1,229
AIRCRAFT AND MISSILES	218	358
Other	1,267	871
Military Construction	1,026	1,007
Family Housing	580	619
Civil Defense	107	93
Military Personnel	14,195	14,771
Active Forces	12,312	12,662
Reserve Forces	674	725
Retired Pay	1,209	1,384
Operations and Maintenance	11,932	12,349
Other	(911)	(1,045)

AEROSPACE SUMMARY

DEPARTMENT OF DEFENSE
TOTAL EXPENDITURES BY APPROPRIATION GROUP—*Continued*
Fiscal Years, 1964 to Date
(Millions of Dollars)

Year Ending June 30

1966 ^r	1967 ^r	1968 ^r	1969 ^r	1970 ^r	1971 ^E	1972 ^E
\$55,181	\$68,315	\$78,027	\$78,666	\$77,880	\$74,500	\$76,000
14,339	19,012	23,283	23,988	21,585	18,447	17,936
6,635	8,411	9,462	9,177	7,948	6,603	6,167
2,069	1,930	2,219	2,509	2,912	3,036	3,348
1,479	1,398	1,356	1,949	2,066	1,993	2,268
^a	^a	738	^a	647	460	413
1,642	3,881	5,709	6,590	4,973	3,686	3,197
983	1,284	1,595	1,409	1,182	1,040	917
1,531	2,108	2,204	2,354	1,857	1,629	1,626
6,259	7,160	7,747	7,459	7,166	7,281	7,504
976	1,048	1,367	1,031	1,239	1,708	1,975
1,801	2,502	2,488	2,410	2,196	2,115	1,787
930	983	1,221	1,159	753	489	489
2,552	2,627	2,671	2,859	2,978	2,969	3,253
968	873	601	686	609	1,205	1,110
299	182 ^b	97 ^b	57 ^b	68	88	96
669	691	504	629	541	1,117	1,014
1,334	1,536	1,281	1,389	1,168	1,200	1,523
647	482	495	572	614	629	726
86	100	108	87	80	74	77
16,753	19,787	21,954	23,828	25,880	25,092	23,849
14,407	17,055	18,988	20,478	21,977	20,516	18,870
755	902	871	907	1,054	1,182	1,235
1,591	1,830	2,095	2,443	2,849	3,394	3,744
14,710	19,000	20,578	22,285	21,609	20,380	20,234
85	365	1,980	(1,628)	(831)	192	3,041

^E Estimate.

^r Revised.

^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.

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 ^r	11,493	7,296	358	3,839
1966	12,710	8,704	299	3,707
1967	15,056	10,341	182	4,533
1968 ^r	16,854	11,681	97	5,076
1969	16,333	11,686	57	4,600
1970 ^r	15,116	10,860	68	4,188
1971 ^E	14,039	9,639	88	4,312
1972 ^E	13,862	9,515	96	4,251

^r Revised.

^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).

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 ^a	18,350	14,528	7,593	5,863	1,072	3,822
1970 ^a	17,945	14,082	8,005	5,439	638	3,863
1971 ^E	16,984	13,715	7,823	5,425	467	3,269
1972 ^E	17,942	14,671	8,389	5,783	499	3,271

^a Estimate.

^a Excludes transfers from stock funds.

Source: Department of Defense, Press Package, January 29, 1971, Reports "FAD" 647, 648, February 2, 1970, and earlier reports. NASA Budget Press Conference, January 28, 1971.

AEROSPACE SUMMARY

ACTIVE MILITARY FORCES OF THE UNITED STATES 1964 and 1970 to Date

Description	Actual		Estimated	
	June 30, 1964	June 30, 1970	June 30, 1971	June 30, 1972
Military personnel (in thousands):				
Army.....	972	1,322	1,107	942
Navy.....	667	693	623	604
Marine Corps.....	190	260	212	206
Air Force.....	856	791	757	753
TOTAL, Department of Defense...	2,685	3,066	2,699	2,505
Selected military forces:				
Strategic forces:				
Intercontinental ballistic missiles:				
Minuteman.....	600	1,000	1,000	1,000
Titan II.....	54	54	54	54
Polaris-Poseidon Missiles.....	336	656	656	656
Strategic bombers (AAI).....	1,277	516	552	510
Manned fighter interceptor squadrons.....	40	14	11	11
Army air defense firing batteries..	107	40	21	21
General purpose forces:				
Army divisions.....	16 $\frac{1}{3}$	17 $\frac{1}{3}$	13 $\frac{2}{3}$	13 $\frac{1}{3}$
Marine Corps divisions.....	3	3	3	3
Air Force wings.....	22	23	21	21
Navy attack wings.....	15	13	12	11
Marine Corps wings.....	3	3	3	3
Attack & antisubmarine carriers.....	24	19	18	16
Nuclear attack submarines.....	19	46	53	56
Escort ships.....	265	231	226	227
Amphibious assault ships.....	139	99	82	76
Airlift and Sealift forces:				
Aircraft squadrons:				
C-5A.....	—	1	2	4
C-133, C-141, C-118, C-124, C-130, C-135.....	32	17	15	13
Troopships, cargo ships, and tankers.....	100	113	105	98

Source: Department of Defense, OASD (Comptroller), January 29, 1971.

AEROSPACE FACTS AND FIGURES, 1971/72

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

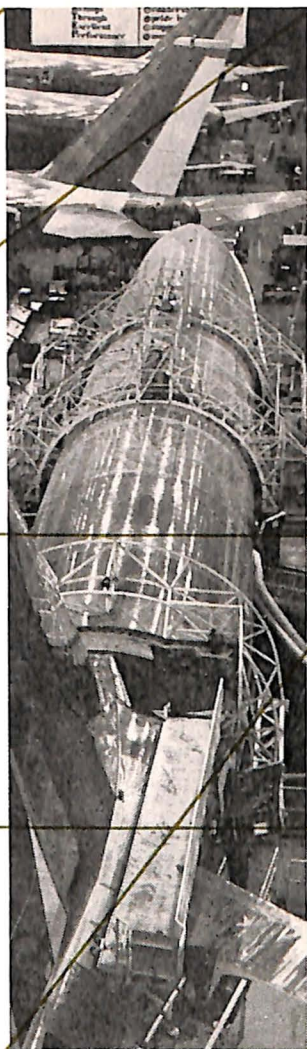
Year Ending December 31	TOTAL AIRCRAFT IN OPERATION	Number Manufactured in the United States	Percent Manufactured in the United States
1958	3,402	2,819	82.9%
1959	3,479	2,868	82.4
1960	3,376	2,766	81.9
1961	3,319	2,542	76.6
1962	3,162	2,345	74.2
1963	3,086	2,266	73.4
1964	3,137	2,317	73.9
1965	3,461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

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

Source: International Air Transport Association.



Aircraft Production



Aircraft production in the United States dropped sharply in 1970 for the second consecutive year—from an estimated 16,997 airplanes in 1969 to an estimated 10,758, a decline of 37 percent.

Commercial air transport production fell from 514 in 1969 to 311 in 1970, a drop of 40 percent.

In general aviation there was a similar decline—from 12,456 units to 7,283, or almost 42 percent.

Even production of commercial helicopters, which had risen slightly from 1968 to 1969, dropped 10 percent—from 534 aircraft to 482. (As was the case in 1969, no figures were available on 1970 production of military helicopters.)

Combined aircraft sales actually rose—from \$12.8 billion in 1969 to

AEROSPACE FACTS AND FIGURES, 1971/72

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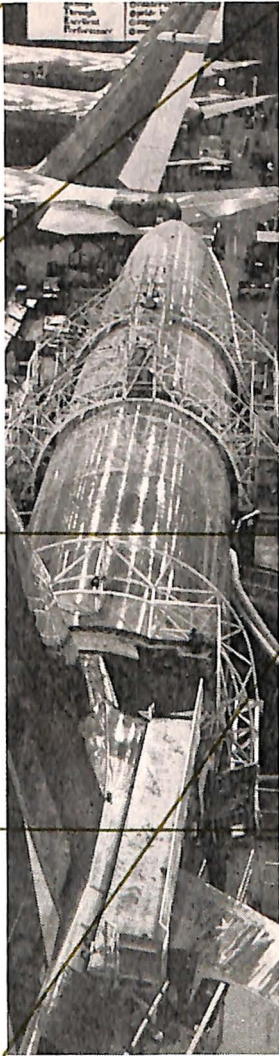
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\$13.5 billion in 1970, or more than 5 percent. Military aircraft sales rose by nearly \$500 million, and commercial sales by nearly \$200 million, the latter mainly because of sales of the wide-bodied 747 jet transport.

The backlog of total aircraft orders declined substantially, however, from \$19.2 billion in 1969 to \$15.7 billion in 1970, or about 18 percent. More than \$2.4 billion of the decline was caused by reductions in commercial orders, while military orders fell off by slightly more than \$1 billion.

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

(Continued on next page)

AIRCRAFT PRODUCTION

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

Year Ending December 31	TOTAL	Military	Civil
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	—
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	19,376	4,400	14,976
1969 ^E	16,997 ^E	3,800 ^E	13,197
1970 ^E	10,758 ^E	2,900 ^E	7,858

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

^E Estimate.

N.A.—Not available.

Sources: Aerospace Industries Association, "Aerospace Facts and Figures" (Annually), Department of Commerce, Bureau of the Census, "Current Industrial Reports, Series M37G" (Monthly), Department of Defense.

AEROSPACE FACTS AND FIGURES, 1971/72

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 ^r	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 ^r	19,188
1970	13,544	15,698

^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).

AIRCRAFT PRODUCTION

**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 ^c	12,764	7,161	5,603	5,382	4,517	1,779	1,086
1970	13,544	7,654	5,890	5,676	4,683	1,978	1,207

^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).

AEROSPACE FACTS AND FIGURES, 1971/72

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

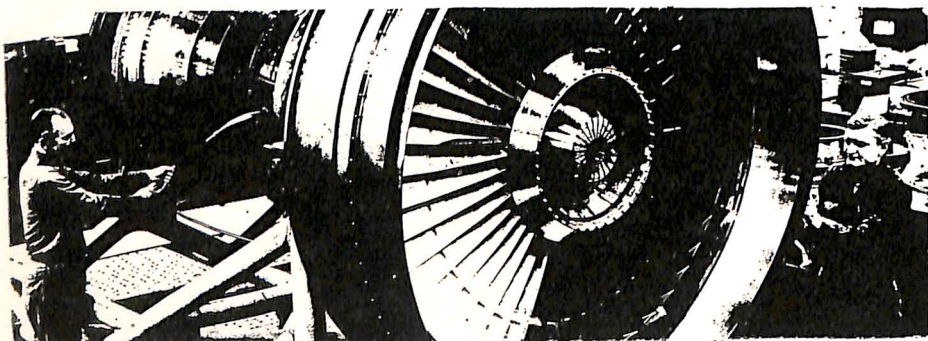
Dec. 31	Total			Aircraft & Parts ^a		Aircraft Engines & Parts	
	TOTAL	U.S. Government	Other	U.S. Government	Other	U.S. Government	Other
1948	\$ 2,983	\$ 2,817	\$ 166	\$ 2,058	\$ 139	\$ 759	\$ 27
1949	2,853	2,708	145	1,998	106	710	39
1950	4,717	4,287	430	2,888	359	1,399	71
1951	11,898	10,899	999	7,549	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 ^r	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 ^r	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 ^r	19,188	7,089	12,099	5,270	10,340	1,819	1,759
1970	15,698	6,022	9,676	4,666	8,601	1,356	1,075

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).



AIRCRAFT PRODUCTION

DEPARTMENT OF DEFENSE EXPENDITURES 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 ^E	6,603	3,946	2,119	538
1972 ^E	6,167	3,518	2,362	287

N.A.—Not available.

^E Estimate.

Source: Department of Defense, Report "FAD 676", January 29, 1971, and earlier reports.

AEROSPACE FACTS AND FIGURES, 1971/72

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

Year Ending Decem- ber 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
<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

(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	<i>b</i>	2.9
1956	90.0	38.6	30.6	13.1	3.3	<i>b</i>	4.4
1957	79.4	32.7	28.7	9.3	4.2	<i>b</i>	4.5
1958	66.1	25.2	18.0	15.9	3.1	<i>b</i>	3.9
1959	51.8	18.6	12.9	14.6	3.5	<i>b</i>	2.2
1960	35.8	13.6	9.1	9.7	1.1	<i>b</i>	2.3
1961	29.6	11.9	6.1	8.3	0.9	<i>b</i>	2.4
1962	35.6	10.3	7.4	13.2	1.3	<i>b</i>	3.4
1963	32.1	4.1	8.2	14.5	1.3	<i>b</i>	4.0
1964	38.7	5.6	12.4	15.1	1.1	<i>b</i>	4.5
1965	33.9	4.7	10.7	10.8	1.4	<i>b</i>	6.3
1966	44.1	4.4	12.6	14.0	1.8	<i>b</i>	11.3
1967	41.3	4.2	11.7	13.0	1.9	<i>b</i>	10.5
1968 ^d	39.4	1.8	20.9	3.0	1.6	<i>b</i>	12.1

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 helicopters 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, 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, 1971/72

FLYAWAY AND WEAPON SYSTEM COST OF MILITARY AIRCRAFT PRODUCED
(By Department, Type and Model)
Calendar Year 1968
(Dollar Figures in Millions)

Department, Type and Model	Number	Flyaway Cost ^a	Weapon System Cost ^b
DEPARTMENT OF DEFENSE ^c —Total . . .	4,440	\$3,871	\$4,560
AIR FORCE—Total	823	1,433	1,824
Bombers (FB-111)	2	16	25
Fighter/Attack	446	1,214	1,585
A-7	5	80	104
A-37	47	26	27
F-4	276	535	812
RF-4	43	98	108
F/RF-5	10	8	8
F-111	65	467	526
Transports	10	43	44
C-141	3	16	17
C-9	7	27	27
Trainers	195	71	76
T-37	84	14	15
T-38	92	57	61
T-41	19	^d	^d
Helicopters	37	40	42
UH-1	12	4	4
CH-3	1	1	1
HH-3	16	16	16
HH-53	8	19	21
Utility	133	49	52
O-2	35	3	4
OV-10	91	46	48
U-17	7	^d	^d
ARMY—Total	2,626	732	737
Helicopters	2,565	677	682
AH-1	419	191	191
UH-1	796	197	197
OH-6	737	56	57
TH-13	151	11	11
CH-47	120	151	153
CH-54	30	60	62
TH-55	312	11	11
Other	61	55	55
OV-1	37	47	47
U-21	24	8	8

(Continued on next page)

AIRCRAFT PRODUCTION

FLYAWAY AND WEAPON SYSTEM COST OF MILITARY AIRCRAFT PRODUCED—Continued
 (By Department, Type and Model)
 Calendar Year 1968
 (Dollar Figures in Millions)

Department, Type and Model	Number	Flyaway Cost ^a	Weapon System Cost ^b
Navy—Total.....	991	1,706	1,999
Patrol (P-3).....	32	101	154
Attack.....	343	667	793
A-4.....	64	67	76
A-6.....	98	312	349
EA-6.....	1	5	6
A-7.....	180	283	362
Fighters.....	218	570	632
F-4.....	217	543	599
F-111.....	1	27	33
Transports.....	8	38	45
LC-130.....	1	4	4
EC-130.....	7	34	41
Trainers.....	97	96	101
T-2.....	29	20	21
TC-4.....	7	19	19
T-39.....	3	3	3
TA-4.....	58	54	58
Utility (OV-10).....	95	45	55
Helicopters.....	198	189	219
UH-1.....	24	7	8
SH-3.....	28	30	35
CH-46.....	92	127	147
CH-53.....	14	20	24
TH-57.....	40	5	5

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

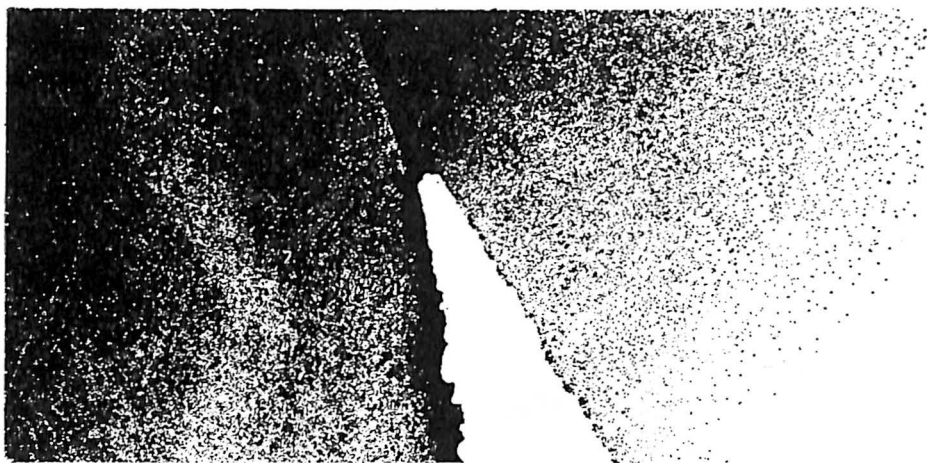
^b Weapon System Cost includes flyaway items, initial spares, and ground equipment and training equipment.

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

^d Less than \$1,000,000.

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

AEROSPACE FACTS AND FIGURES, 1971/72



NUMBER OF MILITARY AIRCRAFT, MISSILES, AND OTHER ITEMS PROGRAMMED
1970, 1971, AND 1972 BY SERVICE

Major Item	Year Ending June 30		
	1970 ^r	1971 ^E	1972 ^E
AIRCRAFT—Total.....	1,896	1,628	878
Air Force.....	552	558	188
Navy and Marine Corps.....	339	268	290
Army.....	1,005	802	400
Helicopters.....	1,247	1,129	442
Fixed Wing Aircraft.....	649	499	436
MISSILES—Total.....	37,730	22,759	21,526
Air Force.....	1,600	542	3,035
Navy and Marine Corps.....	3,051	3,141	2,458
Army.....	33,079	19,076	16,033
SHIPS—Navy—Total.....	15	25	28
New Construction.....	10	15	19
Conversions.....	5	10	9
TRACKED COMBAT VEHICLES—TOTAL.....	3,871	2,098	869
Army.....	3,754	1,800	360
Marine Corps.....	117	298	509

^r Revised.

^E Estimated.

Source: Department of Defense, OASD, Comptroller (Press Package) January 29, 1971.

AIRCRAFT PRODUCTION

PRODUCTION OF COMMERCIAL^a TRANSPORT AIRCRAFT 1963 to Date (Fixed Wing, Multiple Engine)

Company and Aircraft	1963	1964	1965	1966	1967	1968	1969	1970
TOTAL.....	100	163	233	344	480	702	514	311
Boeing								
707.....	28	32	54	77	113	111	59	19
720.....	6	6	9	6	5	—	—	—
727.....	6	95	112	135	115	160	115	54
737 ²⁰⁰	—	—	—	—	4	105	114	37
747.....	—	—	—	—	—	—	4	92
Convair								
880.....	14	—	—	—	—	—	—	—
990.....	15	—	—	—	—	—	—	—
Fairchild								
F-27.....	6	5	12	3	3	—	2	—
FH-227.....	—	—	—	27	35	6	—	—
Lockheed								
130.....	6	—	10	11	9	25	13	25
McDonnell Douglas								
DC-8.....	19	20	31	16	41	102	85	33
DC-9.....	—	—	5	69	155	193	122	51
Other.....	—	5	—	—	—	—	—	—

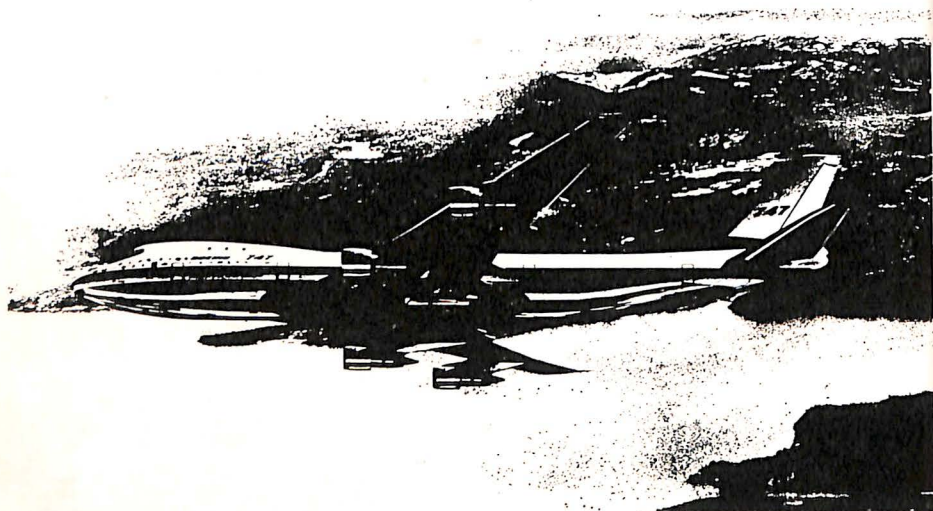
^a Commercial transport totals differ from FAA totals for "Transports" because the FAA totals include some executive and other transports for other than commercial use.
Source: Aerospace Industries Association, company reports.

AEROSPACE FACTS AND FIGURES, 1971/72

TOTAL ORDERS FOR JET TRANSPORTS
(Domestic and Foreign)
As of December 31, 1970

	TOTAL Aircraft for Delivery in 1971 or Later	Domestic Orders	Foreign Orders
<u>Transports</u>			
Number of aircraft.....	634	336	298
Value—million dollars ^a	\$9,319	\$5,182	\$4,137
<u>Number of Transport Aircraft</u>			
<u>Boeing</u>			
B-707.....	5	0	5
B-727.....	38	5	33
B-737.....	17	1	16
B-747.....	108	38	70
<u>Lockheed</u>			
L-1011.....	178	128	50
L-100-30.....	1	1	0
<u>McDonnell Douglas</u>			
DC-8.....	16	0	16
DC-9.....	33	5	28
DC-10.....	238	158	80

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



AIRCRAFT PRODUCTION

SHIPMENTS OF GENERAL AVIATION AIRCRAFT BY SELECTED MANUFACTURERS

Calendar Years 1947 to Date

Year Ending December 31	TOTAL	Beech	Cessna	Champ- ion	Lear	Lock- heed	Mooney a	North Amer- ican Rock- well ^b	Piper	Other
NUMBER OF AIRCRAFT SHIPPED										
1947...	15,594	1,288	2,390	—	—	—	—	—	3,634	8,452
1948...	7,037	746	1,631	—	—	—	—	1,479	3,181	
1950...	3,386	489	1,134	—	—	—	51	—	1,108	604
1952...	3,058	414	1,373	—	—	—	49	39	1,161	22
1954...	3,071	579	1,200	—	—	—	14	67	1,191	20
1956...	6,738	724	3,235	162	—	—	79	154	2,329	55
1958...	6,414	694	2,926	296	—	—	160	97	2,162	79
1960...	7,588	962	3,720	248	—	—	172	155	2,313	18
1961...	6,811	818	2,746	112	—	14	286	139	2,646	50
1962...	6,723	830	3,124	91	—	9	387	121	2,139	22
1963...	7,603	1,061	3,456	99	—	10	502	114	2,321	40
1964...	9,371	1,103	4,188	60	3	6	650	109	3,196	56
1965...	11,967	1,192	5,629	271	80	18	775	110	3,776	116
1966...	15,747	1,535	7,888	331	51	24	917	354	4,437	210
1967...	13,577	1,260	6,233	267	34	19	642	386	4,490	246
1968...	13,698	1,347	6,578	255	41	16	579	471	4,228	183
1969...	12,436	1,031	5,887	293	61	14	376	344	3,951	469
1970...	7,283	793	3,780	205	35	—	238	211	1,675	396
MANUFACTURER'S NET BILLING PRICE (Millions of Dollars)^c										
1947...	57.9	13.4	6.0	—	—	—	—	—	7.7	30.8
1948...	32.5	10.1	6.8	—	—	—	—	—	3.1	12.5
1950...	19.2	6.5	5.5	—	—	—	0.1	—	3.1	4.0
1952...	26.2	9.9	9.2	—	—	—	0.1	2.0	4.9	0.1
1954...	43.5	20.1	10.7	—	—	—	^d	4.5	8.1	0.1
1956...	103.8	28.8	38.6	0.6	—	—	0.7	11.2	23.5	0.4
1958...	101.9	27.1	33.9	1.5	—	—	1.9	6.9	26.5	1.1
1960...	151.2	43.0	56.7	1.5	—	—	2.8	11.9	35.1	0.2
1961...	124.3	37.1	42.3	0.7	—	N.A.	4.0	11.0	28.9	0.3
1962...	136.8	37.4	50.2	0.7	—	N.A.	5.5	10.8	32.1	0.1
1963...	153.4	38.6	55.7	1.1	—	N.A.	7.2	11.9	38.5	0.4
1964...	198.9	54.9	66.8	0.4	N.A.	N.A.	9.6	12.0	54.5	0.7
1965...	318.7	72.2	97.3	1.6	45.1	N.A.	12.2	27.7	62.1	0.5
1966...	408.2	97.3	128.1	2.3	28.6	N.A.	15.4	51.5	80.1	4.9
1967...	359.6	92.0	116.5	2.0	20.2	N.A.	14.6	31.8	79.4	3.1
1968...	421.5	115.7	138.8	2.2	28.7	N.A.	24.7	22.3	85.5	3.6
1969...	584.4	113.1	145.6	2.9	45.6	N.A.	20.5	25.4	98.2	13.2
1970...	336.9	80.6	97.4	2.0	26.8	N.A.	9.5	20.0	48.5	52.1

N.A.—Not available.

^a Includes production of Imco; 1970—Aerostar Aircraft.

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

^c Excludes Grumman, Lockheed and North American Sabreliner.

^d Less than \$50,000.

^e Aero Commander only.

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

AEROSPACE FACTS AND FIGURES, 1971/72

PRODUCTION OF COMMERCIAL HELICOPTERS
(Number of Helicopters)
Calendar Years 1961 to Date

Company and Helicopter	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
TOTAL	378	407	504	579	598	583^a	455^{ab}	522^{ab}	534^{ab}	482^{ab}
Bell										
U.S. production										
47 series	93	92	101	118	134	183	171	151	134	124
204 series	—	1	13	8	16	20	20	—	—	—
205 series	—	—	—	—	—	—	12	29	49	23
206 series	—	—	—	—	—	—	113	184	156	138
212 series	—	—	—	—	—	—	—	—	—	3
Foreign licensees										
47 series	70	63	81	103	123	147	N.A.	N.A.	N.A.	N.A.
204 series	—	18	32	48	48	46	N.A.	N.A.	N.A.	N.A.
102 series	2	—	—	—	—	—	N.A.	N.A.	N.A.	N.A.
Boeing-Vertol										
U.S. production										
BV-44/43	—	1	—	—	—	—	—	—	—	—
BV-107	—	4	5	16	13	13	—	—	—	—
Foreign licensees										
BV-107	—	—	7	3	1	1	—	—	—	—
Brantly										
B2 series	77	62	36	48	25	14	13	—	—	—
305	—	—	—	—	14	23	4	—	—	—
Enstrom										
F-28	—	—	—	—	—	4	7	—	—	—
F-28A	—	—	—	—	—	—	—	13	25	—
Fairchild Hiller										
12 series	99	54	34	34	73	29	9	4	2	—
FH-1100	—	—	—	—	—	8	44	60	40	37
Hughes										
200's	17	86	163	46	23	—	—	—	—	—
300's	—	—	—	121	81	62	48	57	43	74
500's	—	—	—	—	—	—	—	15	65	75
Kaman										
HH-43B	6	11	11	11	10	1	—	—	—	—
HH-43F	—	—	—	—	—	5	—	—	—	—
Sikorsky										
U.S. and foreign production										
S-55	3	—	—	—	—	—	—	—	—	—
S-58	—	—	1	—	—	—	—	—	—	—
S-61	1	8	13	18	31	18	10	6	13	6
S-62	10	6	6	5	1	9	4	3	7	—
S-64	—	1	1	—	—	—	—	—	—	—
S-65	—	—	—	—	—	—	—	—	—	2

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.

AIRCRAFT PRODUCTION

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	N.A.	534 ^b	N.A.	N.A.	N.A.	N.A.
1970	N.A.	482 ^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	28,268	—	8,046	17,686	2,536
1968	29,459	—	8,542	18,182	2,735
1969	27,012 ^E	—	7,600 ^E	17,565 ^r	1,847
1970	16,651 ^E	—	5,800 ^E	9,583	1,268

NOTE: Jet includes turboprop and turbopan.

N.A.— Not available.

^E Estimate.

Sources:

Aerospace Industries Association, "Aerospace Facts & Figures" (Annually).

Bureau of the Census, "Current Industrial Reports, Series M37G" (Monthly).

Department of Defense.

AIRCRAFT PRODUCTION

CIVIL AIRCRAFT ENGINE PRODUCTION Calendar Years 1966 to Date (Number of Engines)

Manufacturer and Engine Designation	1966	1967	1968	1969	1970
TOTAL.....	23,262	20,222	20,917	19,412 ^r	10,851
Reciprocating.....	21,324	17,686	18,182	17,565 ^r	9,583
Jet.....	1,938	2,536	2,735	1,847	1,268
Continental.....	11,132	7,845	7,073	7,695 ^r	4,384
O-200/C-90.....	3,298	2,224	1,912	N.A.	N.A.
O-300.....	1,655	620	1	N.A.	N.A.
IO-346.....	64	58	—	N.A.	N.A.
IO-360/TSIO-360.....	739	1,101	568	N.A.	N.A.
O-470/IO-470/TSIO- 470/GIO-470.....	2,508	1,337	1,656	N.A.	N.A.
GTSIO-520/TSIO-520/ IO-520.....	2,851	2,385	2,515	N.A.	N.A.
PE-150.....	—	120	421	N.A.	N.A.
Other.....	17	—	—	N.A.	N.A.
General Electric.....	489	260	207	192	148
CT-58.....	12	28	27	16	21
CF-700.....	122	150	130	54	34
CJ-610.....	355	82	50	122	93
Lycoming.....	10,192	9,841	11,109	9,870	5,199
O-720/IO-720.....	71	27	17	6	36
O-541/TIO-541/ TIGO-541.....	4	143	210	142	160
O-540/IO-540/TIO-540/ IGO-540/IGSO-540/ IVO-540/VO-540.....	3,429	2,507	2,885	3,580	1,355
O-480/GO-480/IGSO- 480/GSO-480.....	221	203	181	151	100
O-435/GO-435/VO- 435/TVO-435.....	506	344	307	164	114
O-360/IO-360/TIO- 360/HIO-360/AIO- 360.....	2,629	2,733	3,077	1,925	1,442
O-320/IO-320/LIO- 320/AIO-320.....	3,098	3,673	4,055	3,437	1,684
O-290.....	9	6	8	9	6
O-235.....	222	205	369	456	302
Other.....	3	—	—	—	—
Pratt & Whitney.....	1,449	2,276	2,528	1,655	1,120
JT-3D.....	598	874	969	542	127
JT-12.....	167	157	156	129	79
JT-8D.....	684	1,244	1,401	821	448
JT-9D.....	—	—	—	163	466
Other.....	—	1	2	—	—

Revised.
Source: Aerospace Industries Association, company reports.

AEROSPACE FACTS AND FIGURES, 1971/72

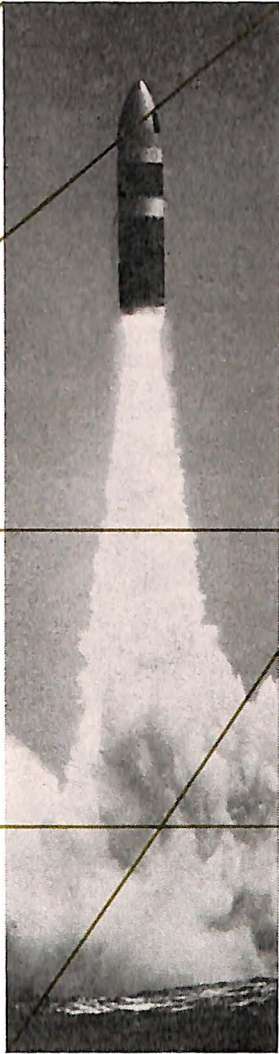
MILITARY AIRCRAFT ENGINE ACCEPTANCES Calendar Years 1959 to Date (Number of Engines)

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	—	—	—	—	—	—	—

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



Missile Programs



Department of Defense expenditures for guided missile procurement rose in Fiscal Year 1970 for the third consecutive year, and estimates are that the gradual increase will continue.

At the same time, however, the total figure for missile research, development, test and evaluation (RDT&E) fell off slightly, as it had during the previous fiscal year, and this trend also is expected to continue in the next two years.

Procurement spending climbed in all three services, with the result that total DoD expenditures for guided missiles went from \$2.5 billion in FY 1969 to \$2.9 billion in FY 1970—the highest figure since FY 1964.

Net sales of missile systems and parts rose slightly, from \$2.7 billion in calendar 1969 to \$2.8 billion in 1970. Backlog as of Dec. 31, 1970,

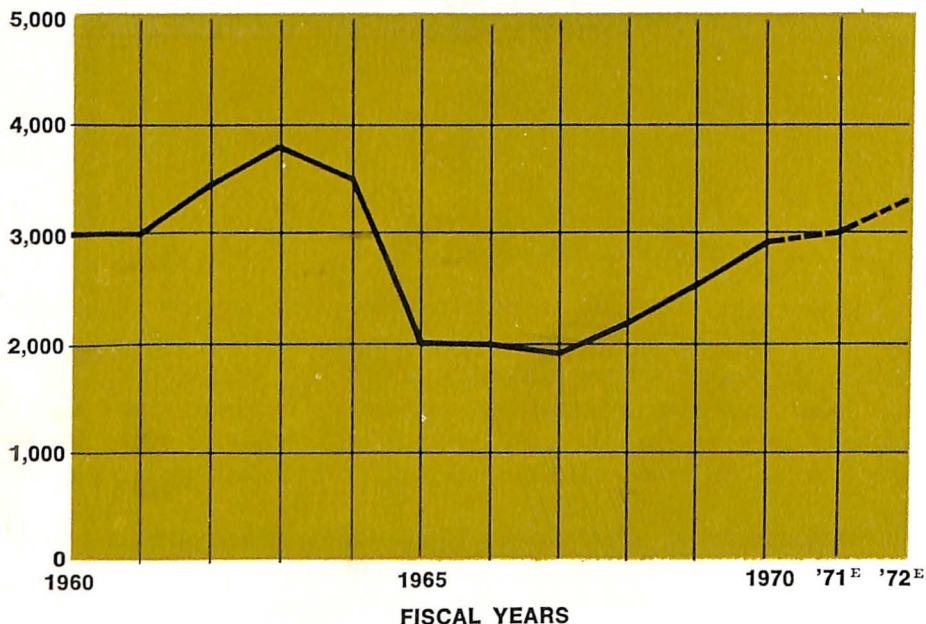
AEROSPACE FACTS AND FIGURES, 1971/72

was \$2.7 billion, compared with \$2.4 a year earlier, thus reversing the decline between 1968 and 1969.

Sales of propulsion systems for missiles and space vehicles declined, as they had for several preceding years. The drop was from \$702 million in calendar 1969 to \$641 million in 1970. In contrast with the previous year's decline, which resulted almost entirely from cutbacks in non-military systems, the bulk of the reduction was in military sales. The latter dropped from \$667 million to \$619 million, while non-military sales fell from \$35 million to \$22 million. Total backlog rose substantially, however, from \$497 million to \$619 million; military backlog accounted for all of the increase, rising from \$485 million to \$611 million while non-military backlog fell from \$12 million to \$8 million, continuing a six-year decline.

Intercept test firings of the Army's Safeguard ABM missiles—Spartan and Sprint—continued and were mainly successful. The Navy's Sea Sparrow surface-to-air system became operational, and research was begun on a new Navy air-to-surface weapon, the Harpoon.

EXPENDITURES FOR GUIDED MISSILES (IN MILLIONS OF DOLLARS)



E — Estimated

SOURCE: DEPARTMENT OF DEFENSE

MISSILE PROGRAMS

DEPARTMENT OF DEFENSE
EXPENDITURES 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 ^E	3,036	1,459	766	812
1972 ^E	3,348	1,507	828	1,013

NOTE: For data on research and development expenditures for missiles see pages 48 and 67.

N.A.—Not available.

E—Estimate.

Source: Department of Defense, Report "FAD 676," January 29, 1971, and earlier reports.

AEROSPACE FACTS AND FIGURES, 1971/72

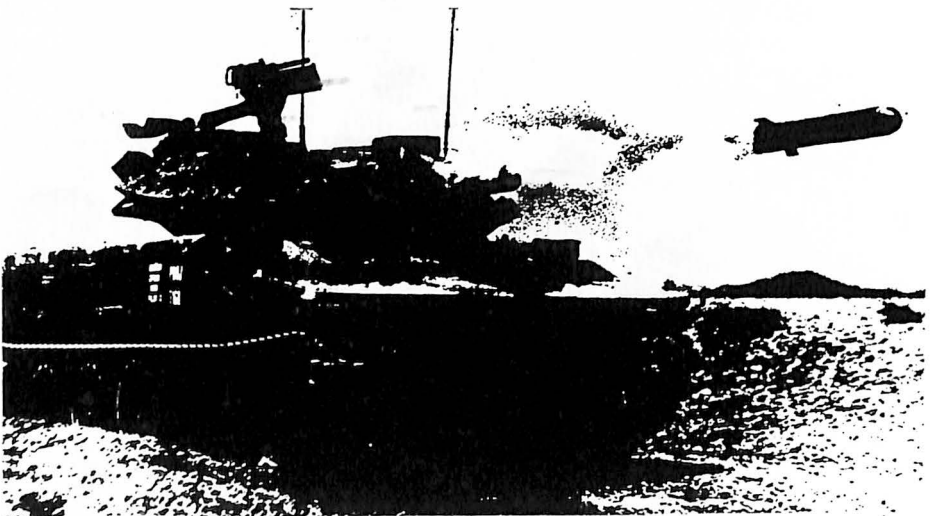
DEPARTMENT OF DEFENSE
OUTLAYS FOR GUIDED MISSILES
Fiscal Year 1960 to Date
(Millions of Dollars)

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 ^E	5,151	3,036	2,115
1972 ^E	5,135	3,348	1,787

^E Estimate.

NOTE: Does not include military assistance.

Source: Department of Defense, Press Package, January 29, 1971, & earlier FAD Reports.



**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	2,686	2,364
1970	2,831	2,740

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 48).
Source: Bureau of the Census, "Current Industrial Reports," MQ37D (Quarterly).

**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	"	N A.	\$367	"
1962	N.A.	1,060	"	N.A.	498	"
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	641	619	22	619	611	8

" Data included in totals for space vehicle systems. See page 53.
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 M37D (Quarterly).

AEROSPACE FACTS AND FIGURES, 1971/72

MAJOR MISSILES IN DEVELOPMENT OR PRODUCTION

Project	Service	Systems Contractor	Propulsion		Guidance Mfr.	Status
			Manufacturer	Type		
SURFACE-TO-AIR						
Bomarc B Chaparral	USAF Army	Boeing Philco-Ford	Marquardt NAR/Rocket- dyne	Solid Solid	Westinghouse GE/Raytheon	Operational Operational
Hawk Nike-Hercules	Army Army	Raytheon Western Electric	Aerojet Thiokol/ Hercules	Solid Solid	Raytheon Bell Tel. Lab/West. 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	Aerojet	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	Operational
Terrier	USN	General Dynamics	Atlantic Research	Solid	General Dynamics	Operational
AIR-TO-AIR						
Falcon Falcon	USAF USAF	Hughes Hughes	Thiokol Lockheed Propulsion	Solid Solid	Hughes Hughes	Operational Operational
Super Falcon Nuclear Falcon Genie	USAF USAF	Hughes Hughes	Thiokol Thiokol	Solid Solid	Hughes Hughes	Operational Operational
Phoenix	USAF	McDonnell Douglas	Aerojet/ Thiokol	Solid	—	Operational
Sidewinder 1A	USN	Hughes	NAR/Rocket- dyne	Solid	Hughes	Development
Sidewinder 1C	USN	Naval Weapons/ Philco/ GE	Naval Propulsion Plant	Solid	Philco/GE	Operational
Sparrow 3	USN	Naval Weapons/ Philco/ Raytheon	NAR/Rocket- dyne	Solid	Philco/ Raytheon	Operational

MISSILE PROGRAMS

MAJOR MISSILES IN DEVELOPMENT OR PRODUCTION—*Continued*

Project	Service	Systems Contractor	Propulsion		Guidance Mfr.	Status
			Manufacturer	Type		
SURFACE-TO-SURFACE						
Advanced ICBM	USAF	—	—	—	—	Research
Mace B	USAF	Martin Marietta	GM-Allison	Turbo jet	GM/Delco Electronics	Operational
Minuteman	USAF	Boeing	Thiokol/Aerojet/Hercules	Solid	NAR/Autonetics	Operational
Polaris	USN	Lockheed	Aerojet/Hercules	Solid	GE/MIT/Hughes/Raytheon	Operational
Poseidon	USN	Lockheed	Thiokol/Hercules	Solid	GE/MIT/Raytheon	Development
Titan II	USAF	Martin Marietta	Aerojet	Liquid	GM/AC Electronics	Operational
AIR-TO-SURFACE						
Bullpup A	USN	Maxson Electronics	Thiokol/Reaction	Solid	Maxson Electronics	Operational
Bullpup B	USN	Maxson Electronics	Thiokol/Reaction	Solid	Maxson Electronics	Operational
Cobra	USAF	—	—	—	—	Research
Condor	USN	Naval Air Systems Command/NAR	NAR/Rocketdyne	Solid	Hughes	Development
Harpoon	USN	—	—	—	—	Research
Hornet	USAF	NAR/Col	—	—	—	Development
Hound Dog	USAF	NAR	P&W	Turbo jet	NAR/Autonetics	Development
Maverick	USAF	Hughes/NAR	Thiokol	Solid	—	Development
Quail	USAF	McDonnell Douglas	General Electric	Turbo jet	McDonnell Douglas	Operational
SCAD	USAF	—	—	—	—	Research
Shrike	USN	NASC/NWC	NAR/Rocketdyne	Solid	Tex. Instru./Sperry/Bristol	Operational
SRAM	USAF	Boeing	Lockheed	Solid	General Precision	Development
Standard ARM	USN	General Dynamics	Aerojet	Solid	Maxson Electronics	Operational
Walleye	USN	Martin Marietta/Hughes	—	Glide Bomb	Martin Marietta	Operational

MAJOR MISSILES IN DEVELOPMENT OR PRODUCTION—Continued

Project	Service	Systems Contractor	Propulsion		Guidance Mfr.	Status
			Manufacturer	Type		
BATTLEFIELD SUPPORT GUIDED MISSILES						
Lance	Army	LTV Aerospace	NAR/ Rocketdyne	Liquid	LTV Systron- Donner/ Arma	Development
Dragon	Army	McDonnell Douglas	McDonnell Douglas	Solid	McDonnell Douglas	Development
Pershing I-A	Army	Martin Marietta	Thiokol	Solid	Bendix	Operational
Sergeant	Army	Sperry Rand	Thiokol	Solid	Sperry Rand	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	—	Development
UNGUIDED MISSILES						
Honest John	Army	Emerson Electric	Hercules	Solid	—	Operational
ANTI-SUBMARINE						
Asroc	USN	Honeywell	Naval Propulsion	Solid	—	Operational
Subroc	USN	Goodyear Aerospace	Thiokol	Solid	General Precision	Operational

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

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

Source: Department of Defense.

Space Programs



Apollo 14 early in 1971 demonstrated that the U. S. space program has reached a level of technical excellence that opens the way to expanded exploration and exploitation of the near universe.

The most rewarding lunar-landing mission to date, in terms of hours spent exploring the Moon, experiments performed, and material and information returned, Apollo 14 began with liftoff from Cape Kennedy on Jan. 31. Astronauts Alan B. Shepard, Jr., and Edgar D. Mitchell carried out the lunar landing and exploration while Stuart A. Roosa remained in the Command Module. Mission completed, the Lunar Module returned to the mother ship, which brought the crew back to a now nearly routine splashdown and recovery in the South Pacific on Feb. 9.

Apollo 14 made its landing in the Fra Mauro area of the Moon where

AEROSPACE FACTS AND FIGURES, 1971/72

Apollo 13 was to have descended. Apollo 13, launched April 11, 1970, was aborted without landing on the moon when an oxygen tank exploded in the Saturn vehicle en route. Utilizing life support systems aboard the Lunar Module to conserve those aboard the Command Module, the astronauts—James A. Lovell, Jr., Fred W. Haise, Jr., and John L. Swigert, Jr.—made a single swing around the Moon and returned to safe recovery in the South Pacific.

Major events in unmanned space flight during 1970 included the launchings of three Intelsat III communications satellites (two successful,

EXPENDITURES 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 ^E	4,888	3,185	1,577	96	30
1972 ^E	4,633	2,958	1,575	62	38

NOTE: Most of the activities of the National Aeronautics and Space Administration are classified as Research and Development. 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). 1970-1972: National Aeronautics and Space Council, Aeronautics and Space Report of the President, January 1971 (Annually).

SPACE PROGRAMS

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

Year Ending Decem- ber 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 ^r	2,282	1,187	1,095	1,330	869	461
1970	2,014	1,065	949	1,132	708	424

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.

one failing to reach its planned orbit); the first operational spacecraft of the Improved TIROS Operational System (ITOS) meteorological satellite series; the Nimbus-IV satellite, for global sampling of atmospheric radiation; the SERT-II, first orbital test of electron-bombardment on engines; the Orbiting Frog Otolith (OFO), in which it was found that frogs adapted to zero gravity after three days in orbit.

Also, the first launch of a U S. spacecraft by a crew of another nation occurred on Dec. 12, 1970, when an Italian crew launched Explorer XLII (SAS-A), from a mobile seaborne platform off Kenya, East Africa.

In the military space program, a highlight was the launch of the sixth pair of Vela nuclear detection satellites from Cape Kennedy on April 8, 1970. These spacecraft can view surface and low-altitude detonations while still maintaining a constant monitoring of deep space. NATO I, a military communications satellite for the NATO forces, was launched from the Cape on March 20, and the Department of Defense (DoD) successfully conducted a number of launches of classified payloads.

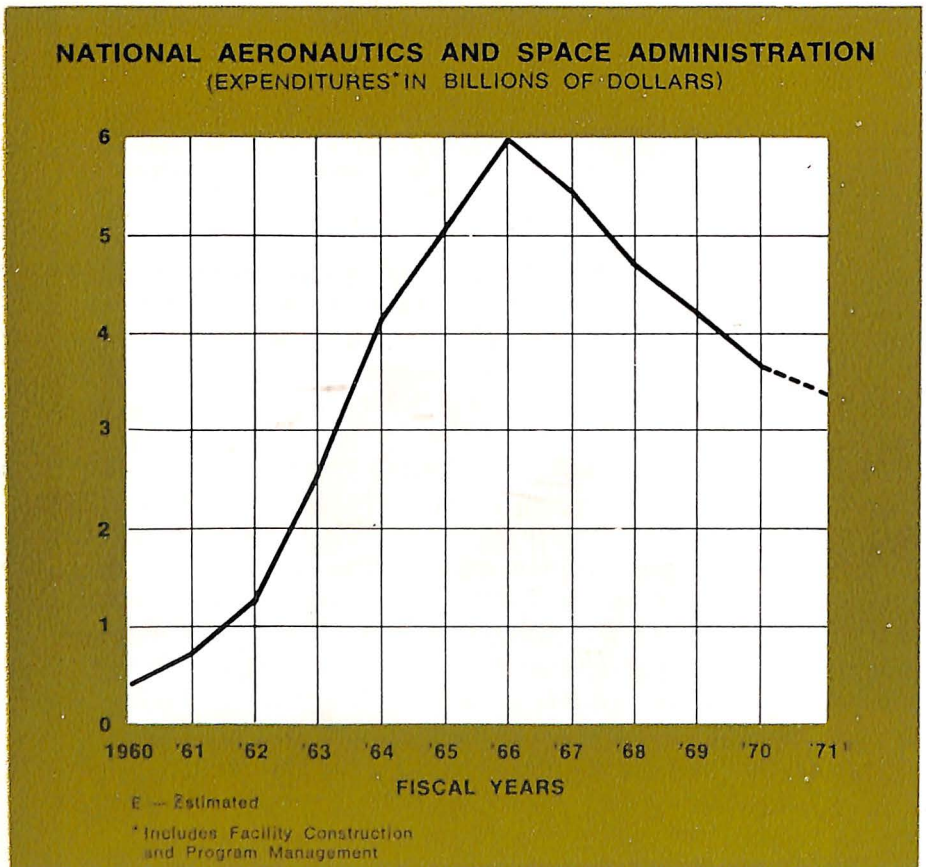
DoD also continued to operate and refine its satellite navigation and geodetic systems through previously launched spacecraft.

The Atomic Energy Commission continued to develop nuclear power

AEROSPACE FACTS AND FIGURES, 1971/72

systems for future space use. The SNAP-19 and SNAP-27 radioisotope generators launched in 1969 passed one year of continuous operation. Nuclear Engine for Rocket Vehicle Application (NERVA) engine development work concentrated on definition and preliminary design of a flight-rated engine, a candidate fuel element for NERVA successfully completed 10 hours of electrical corrosion testing, and the Pewee-2 experimental reactor was fabricated and delivered for testing in early 1971.

Among other Government agencies, the Environmental Sciences Services Administration (ESSA) of the Department of Commerce continued operation of its ESSA weather satellite network; the Departments of Interior and Agriculture conducted further joint studies with NASA on development of Earth resources survey satellites, and the National Science Foundation maintained its contribution to space sciences through a number of programs.



SPACE PROGRAMS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, EXPENDITURES 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 ^E	3,369	2,610	50	709
1972 ^E	3,152	2,411	43	698

^E Estimate.

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

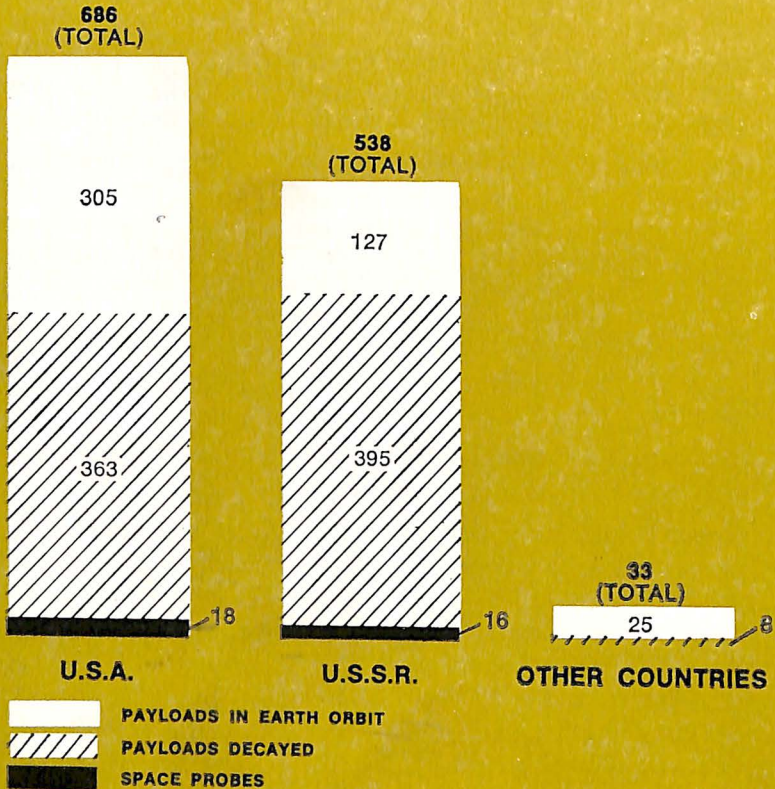
Estimated total space expenditures in Fiscal Year 1971 were about \$4.9 billion, continuing a downward trend that began in FY 1967 following a peak of \$7.7 billion in FY 1966. The FY 1971 estimate indicated a drop of more than \$550 million from actual spending in the previous year.

Of the FY 1971 estimated total, \$3.19 billion is for NASA, a decline of \$380 million from FY 1970; \$1.58 billion is for DoD, down by \$180 million; \$96 million for AEC, down \$7 million; and \$30 million for other agencies, up \$1 million.

Space sales in calendar year 1970 continued their corresponding decline, dropping to \$3.6 billion compared with \$4.3 billion in 1969. This reflected the virtual completion of the hardware phase of the Apollo program, as well as the decline in military space expenditures.

Another, smaller decline is expected in total space expenditures for FY 1972, to a level of about \$4.6 billion. NASA is expected to absorb nearly all of the \$250-million decline, with DoD spending continuing at its present level. Civilian funding may be expected to increase thereafter, however, with approval of the space shuttle program, key to the space effort of the 1970s and 1980s.

SPACECRAFT LAUNCHINGS (AS OF MAY 30, 1971)



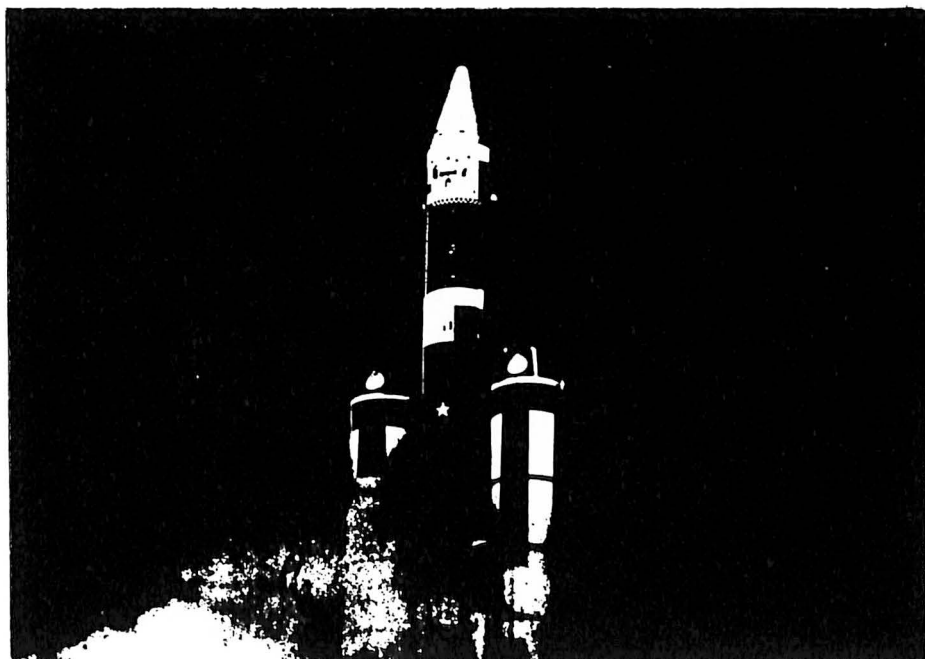
SOURCE: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

SPACE PROGRAMS

SPACECRAFT LAUNCHINGS AS OF MAY 30, 1971

Country	TOTAL	Payloads in Earth Orbit	Payloads Decayed	Space Probes
TOTAL	1,257	457	766	34
United States.....	686	305	363	18
U.S.S.R.....	538	127	395	16
France.....	7	7	—	—
United Kingdom.....	5	3	2	—
Canada.....	4	4	—	—
European Space Research Organization.....	4	1	3	—
Italy.....	3	1	2	—
Australia.....	2	1	1	—
Japan.....	2	2	—	—
China (Mainland).....	2	2	—	—
N.A.T.O.....	2	2	—	—
Germany.....	2	2	—	—

Source: National Aeronautics and Space Administration.



AEROSPACE FACTS AND FIGURES, 1971/72

CHRONOLOGY OF MAJOR UNITED STATES SPACE LAUNCHINGS, 1970

Date	Designation	Purpose
<i>1970</i>		
Jan. 15	Intelsat III F-6	To provide equivalent of 1,200 2-way voice-circuits or 4 color TV channels to carry communications traffic between the United States, Latin America, Europe and the Middle East.
Jan. 23	ITOS (Tiros M)	To flight-qualify the prototype second-generation operational meteorological satellite.
Feb. 4	SERT-II	First orbital test of electron-bombardment ion engines.
Mar. 20	NATO I	Military communications satellite.
Apr. 8	Nimbus-IV	Global sampling of atmospheric radiation.
Apr. 11	Apollo 13	Third manned lunar landing attempt. Aborted after 36 hours due to oxygen tank explosion. Successful recovery.
Apr. 23	Intelsat III F-7	To provide equivalent of 1,200 2-way voice-circuits or 4 color TV channels to carry communications traffic between the United States, Europe, North Africa and the Middle East.
Jul. 23	Intelset III F-8	To provide equivalent of 1,200 2-way voice-circuits or 4 color TV channels to carry communications traffic between the continental United States, Hawaii and the Western Pacific. Motor cut off before satellite achieved planned synchronous orbit; contact lost.
Aug. 19	SKYNET II	Second and final military communications satellite launched for United Kingdom. Contact lost during apogee boost motor firing.
Nov. 9	Orbiting Frog Otolith (OFO)	To obtain information on the functioning and adaptability in weightlessness of the portion of the inner ear which controls balance. Frogs adapted to zero gravity after 3 days in orbit.
Dec. 11	NOAA-I	First operational spacecraft of Improved TIROS Operational System (ITOS) series.
Dec. 12	Explorer XLII (SAS-A)	To develop a catalog of celestial X-ray sources by systematic scanning of the celestial sphere in the energy range from 2-20 KEV. First launch of a United States spacecraft by a crew of another nation (Italy). Launched from mobile seaborne platform off Kenya.

NOTE: For data for earlier years, see previous editions of "Aerospace Facts and Figures." This chronology of major U. S. space programs includes the successful, partially successful, and unsuccessful launchings of all vehicles larger than sounding rockets.

Source: National Aeronautics and Space Administration.

SPACE PROGRAMS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
RESEARCH AND DEVELOPMENT PROGRAMS BUDGET PLAN
Fiscal Years, 1968 to Date
(Millions of Dollars)

	Fiscal Years Ending June 30				
	1968	1969	1970	1971	1972
TOTAL.....	\$3,967	\$3,193	\$3,110	\$2,555	\$2,518
MANNED SPACE FLIGHT—					
TOTAL.....	2,809	2,177	2,030	1,431	1,287
Apollo.....	2,556	2,025	1,684	914	612
Space flight operations.....	253	150	343	515	673
Advanced missions.....	—	2	3	2	2
SPACE SCIENCE AND APPLI- CATIONS—TOTAL.....	553	438	520	566	750
Physics and astronomy.....	140	125	113	116	110
Lunar and planetary explora- tion.....	148	82	151	145	312
Bioscience.....	42	33	20	13	—
Space applications.....	99	98	128	167	182
Launch vehicle procurement...	124	100	108	125	146
ADVANCED RESEARCH AND TECHNOLOGY—TOTAL.....	315	285	271	264	213
Aeronautical research & technology.....	N.A.	N.A.	96	102	110
Space research & technology.....	N.A.	N.A.	120	107	75
Nuclear power & propulsion ...	N.A.	N.A.	55	55	28
TRACKING AND DATA ACQUI- SITION—TOTAL.....	276	280	278	290	264
UNIVERSITY AFFAIRS—TOTAL....	10	9	7	—	—
Sustaining university program.	10	9	7	—	—
TECHNOLOGY UTILIZATION— TOTAL.....	4	4	5	4	4

NOTE: Administrative operations costs for NASA are not included.
Source: National Aeronautics and Space Administration, Briefing on the Budget of the United States, January 29, 1971.

AEROSPACE FACTS AND FIGURES, 1971/72

CHRONOLOGY OF MANNED SPACE FLIGHTS, 1967 TO DATE

Launch Date	Project	Pilot	Nation	Duration
Apr 23, 1967	Soyuz 1	Vladimir M. Komarov	USSR	26 hr. 40 min.
Oct 11, 1968	Apollo 7	Walter M. Schirra, Jr. Donn F. Eisele R. Walter Cunningham	USA	260 hr. 8 min.
Oct 26, 1968	Soyuz 3	Georgi Beregovoy	USSR	94 hr. 51 min.
Dec 21, 1968	Apollo 8	Frank Borman James A. Lovell, Jr. William A. Anders	USA	147 hr., including 20 hours in lunar orbit
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 Filipchenko Vladislav Volkov Viktor Gorbato	USSR	118 hr. 43 min.
Oct 13, 1969	Soyuz 8	Vladimir Shatalov Alecksey Yeliseyev	USSR	118 hr. 51 min.
Nov 14, 1969	Apollo 12	Charles Conrad, Jr. Richard F. Gordon, Jr. Alan L. Bean	USA	244 hr. 36 min.
Apr 11, 1970	Apollo 13	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. 2 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	(Still in orbit Jun 16)

NOTE: For data for earlier years see previous editions of "Aerospace Facts and Figures."
Source: National Aeronautics and Space Administration; Library of Congress.

SPACE PROGRAMS

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	—	15	—	30
MA-6 (Glenn)	Feb 20, 1962	4	55	5	25
MA-7 (Carpenter)	May 24, 1962	4	56	10	21
MA-8 (Schirra)	Oct 3, 1962	9	13	19	34
MA-9 (Cooper)	May 15, 1963	34	20	53	54
Gemini 3 (Grissom, Young)	Mar 23, 1965	9	46	63	40
Gemini 4 (McDivitt, White)	Jun 3, 1965	195	53	259	33
Gemini 5 (Cooper, Conrad)	Aug 21, 1965	381	51	641	24
Gemini 6 (Schirra, Stafford)	Dec 15, 1965	51	43	693	07
Gemini 7 (Borman, Lovell)	Dec 4, 1965	661	10	1,354	17
Gemini 8 (Armstrong, Scott)	Mar 16, 1966	21	12	1,375	29
Gemini 9 (Stafford, Cernan)	Jun 3, 1966	72	21	1,447	50
Gemini 10 (Young, Collins)	Jul 18, 1966	70	46	1,518	36
Gemini 11 (Conrad, Gordon)	Sep 12, 1966	71	17	1,589	53
Gemini 12 (Lovell, Aldrin)	Nov 11, 1966	94	34	1,684	27
Apollo 7 (Schirra, Eisele, Cunningham)	Oct 11, 1968	780	26	2,774	8
Apollo 8 (Borman, Lovell, Anders)	Dec 21, 1968	441	—	3,215	8
Apollo 9 (McDivitt, Scott, Schweikart)	Mar 3, 1969	725	02	3,456	01
Apollo 10 (Stafford, Young, Cernan)	May 18, 1969	576	10	4,516	11
Apollo 11 (Armstrong, Collins, Aldrin)	Jul 16, 1969	585	56	5,101	07
Apollo 12 (Conrad, Gordon, Bean)	Nov 14, 1969	733	49	5,834	56
Apollo 13 (Lovell, Haise, Swigert)	Apr 11, 1970	142	01	5,976	55
Apollo 14 (Shepard, Stuart, Mitchell)	Jan 31, 1971	216	02	6,192	57

Source: National Aeronautics and Space Administration.

AEROSPACE FACTS AND FIGURES, 1971/72

UNITED STATES SPACE LAUNCH VEHICLES

Vehicle	Stages	Thrust (in thousands of pounds)	Payload (pounds)	
			300 Nautical miles Orbit	Escape
Scout	<ol style="list-style-type: none"> 1. Algol (IIB)* 2. Castor II* 3. Antares II* 4. Altair III* or FW4 	<p>100.9 60.7 20.9 5.9</p>	320	50
Thrust Augmented Thorad-Delta	<ol style="list-style-type: none"> 1. Thor (SLV-2J) plus three TX354-5* 2. Delta (DSV-3) 3. FW-4D/TE 364* 	<p>170 plus 52 each 7.8 5.9/ 10.0</p>	2,000	525
Thrust Augmented Thorad-Agena	<ol style="list-style-type: none"> 1. Thor (SLV-2H) plus 3 TX 354-5* 2. Agena 	<p>170 plus 52 each 16</p>	2,900	—
Atlas-Burner II	<ol style="list-style-type: none"> 1. Atlas Booster and Sustainer (SLV-3A) 2. Burner II* 	<p>400 10</p>	4,950	700
Atlas-Agena	<ol style="list-style-type: none"> 1. Atlas Booster and Sustainer (SLV-3A) 2. Agena 	<p>465 16</p>	7,500	1,430
Titan IIB-Agena	<ol style="list-style-type: none"> 1. LR-87 2. LR-91 3. Agena 	<p>440 100 16</p>	8,000	1,550
Titan IIC	<ol style="list-style-type: none"> 1. Two 5-segment 120" diameter* 2. LR-87 3. LR-91 4. Transtage 	<p>2,400 527 100 16</p>	25,000	5,500

(Continued on next page)

SPACE PROGRAMS

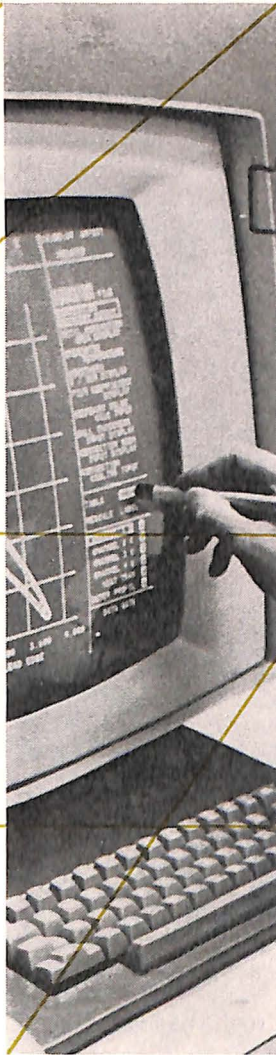
UNITED STATES SPACE LAUNCH VEHICLES—*Continued*

Vehicle	Stages	Thrust (in thousands of pounds)	Payload (pounds)	
			300 Nautical miles Orbit	Escape
Titan-Centaur	1. Two 5-Segment 120" diameter*	2,400	32,000	11,000
	2. LR-87	440		
	3. LR-91	110		
	4. Centaur (Two RL-10)	30		
Atlas-Centaur	1. Atlas Booster and Sustainer	400	9,100	2,700
	2. Centaur (Two RL-10)	30		
Upgraded Saturn IB	1. S-IB (8 H-1)	1,600	40,000@ 105 NM	—
	2. S-IVB (1J-2)	200		
Saturn V	1. S-IC (5F-1)	7,570	285,000@ 105 NM	100,000
	2. S-II (5J-2)	1,150		
	3. S-IVB (1J-2)	230		

* Solid propellant, all other are liquid.

Source: Aeronautics & Space Report of the President, January, 1971.

Research and Development



Total Federal support of research and development rose slightly in FY 1971 and the trend is expected to continue into FY 1972. The \$16.3 billion estimated for FY 1972, however, is below the all-time peak of \$16.9 billion in FY 1968.

The major portion of the increased Federal support for R&D was registered in the social sciences, health services, mass transportation and other programs not connected with the Department of Defense, National Aeronautics and Space Administration and the Atomic Energy Commission. Government funding in R&D for social programs rose by more than 13 percent while the increase in the DoD research and development budget was about 2 percent.

Clarification of the government's accounts is necessary, for the entire

RESEARCH AND DEVELOPMENT

NASA budget is listed as an R&D expenditure. This total of \$3.2 billion in FY 1972 includes approximately \$54 million for construction of new facilities and for administration, which are not included under R&D in the accounting for other agencies.

Company-initiated spending for R&D continued at a high level, with \$1.3 billion invested by aerospace industry firms in 1969. This was the third year that the industry spent more than \$1 billion for R&D, reflecting the steadily increasing complexity of the aircraft, missile and space business.

Aircraft received more funding than missiles for the first time in a

FEDERAL EXPENDITURES 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	10,373	6,812	1,251	1,284	1,026
1963	11,988	6,849	2,540	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 ^E	15,960	7,706	3,369	1,619	3,266
1972 ^E	16,258	7,887	3,152	1,523	3,696

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, 1971/72

decade in Department of Defense budget for Research, Development, Test and Evaluation. Major new aircraft programs include the F-14 carrier fighter, the F-15 air superiority fighter, the EA-6B tactical countermeasures aircraft and the B-1 strategic bomber.

In the missile field, the major activity was the refitting of the Navy fleet ballistic missile submarines to accommodate the Poseidon missile, the continued deployment of advanced Minutemen missiles by the Air Force and the Army's work with the Safeguard ABM system.

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 ^E	7,281	2,963	2,177	1,638	503
1972 ^E	7,504	2,947	2,260	1,778	519

^E Estimate.

N.A.—Not available.

NOTE: For RDT&E for aircraft, missiles and astronautics, see page 67.

Source: Department of Defense, Press Release, January 29, 1971, and earlier FAD 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	939	2,352	1,284	2,446
1965	6,236	3,839	1,017	1,901	921	2,397
1966	6,259	3,707	976	1,801	930	2,552
1967	7,160	4,533	1,048	2,502	983	2,627
1968	7,747	5,077	1,335	2,522	1,220	2,670
1969	7,457	4,600	1,031	2,410	1,159	2,857
1970	7,166	4,188	1,239	2,196	753	2,978
1971 ^E	7,281	4,312	1,708	2,115	489	2,969
1972 ^E	7,504	4,251	1,975	1,787	489	3,253

^E Estimate.

Source: Department of Defense, Press Release, January 29, 1971.

RDT&E spending for space related activities was held to \$489 million for the second straight year, down from \$1.2 billion five years ago.

In NASA's budget, the most critical research and development project is the space shuttle, which is considered vital to the maintenance of U.S. leadership in space flight. The shuttle is a rocket-powered, recoverable booster that can return to its launch site and land in aircraft fashion. It will lower the cost of sending payloads into orbit and will replace most of the launch vehicles now employed by NASA and the Department of Defense.

NASA also is working toward the launching of the Apollo Workshop, an orbiting station which will house crews of astronauts for periods of about two months. The current schedule calls for this station to become operational in 1973, about two years after the last Apollo flight to the moon.

Atomic Energy Commission research and development related to aerospace is due to drop substantially because the NERVA, nuclear rocket project, has been placed in mothball status.

AEROSPACE FACTS AND FIGURES, 1971/72

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

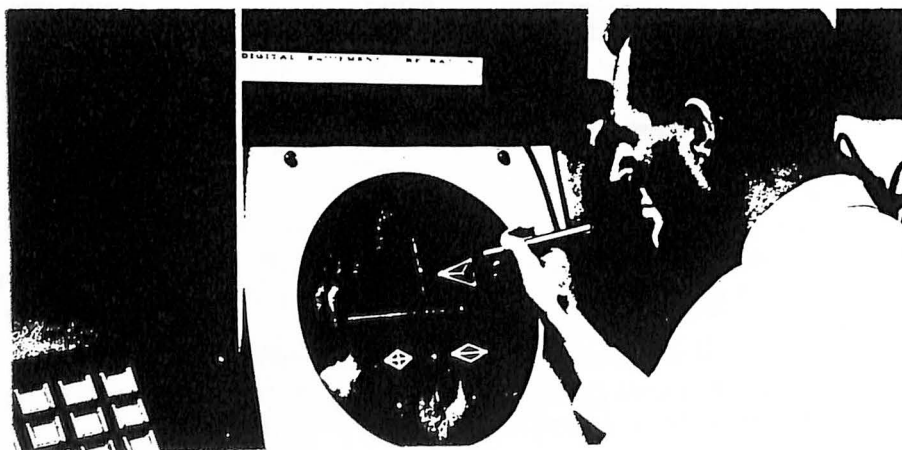
Year Ending December 31	TOTAL AERO- SPACE	Applied Research and Development Funds			Basic Research Funds		
		Total	Federal Govern- ment Contracts	Com- pany	Total	Federal Govern- ment Contracts	Com- pany
1957	\$2,574	\$2,549	N.A.	N.A.	\$25	N.A.	N.A.
1958	2,609	2,583	\$2,266	\$317	26	\$10	\$16
1959	3,090	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 ^r	5,658	5,592	4,485 ^a	1,107 ^a	67	25 ^a	42 ^a
1969	5,801	5,738	4,500	1,237	63	24	40

N.A.—Not available.

^r Revised.

^a Estimated by the National Science Foundation. Revised data not collected.

Source: National Science Foundation, Aerospace Industries Association.



RESEARCH AND DEVELOPMENT

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 ^r	17,469	5,658	4,506	1,152
1969	18,474	5,801	4,524	1,277

^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.

Foreign Trade



Total aerospace exports reached a new high of \$3.4 billion during 1970, an 8 percent increase over the previous record year of 1969. Exports represented 14 percent of the industry's total sales and 1970 was the fourteenth year in which aerospace exports exceeded \$1 billion.

The aerospace trade balance increased to \$3.1 billion in 1970, a 9 percent increase over 1969 which was a record \$2.8 billion. Aerospace imports remained at the same level, with \$308 million in 1970 compared with \$307 million for 1969.

The exports of the aerospace industry continued to be a major factor in the nation's overall balance of trade position as high technology products played dominant roles in U.S.-manufactured exports.

Civilian aerospace exports increased in 1970 to \$2.5 billion, a 24

FOREIGN TRADE

percent increase over the \$2 billion in 1969. Military aerospace exports declined to \$900 million in 1970 in comparison with \$1,100 million in 1969 showing a 20 percent decrease.

Foreign deliveries of the wide-bodied jet transports which began during 1970 along with continued deliveries of other jet transports in the "over 33,000 pound" category posted a record \$1.28 billion in 1970. The dollar value of the large commercial transports exported increased by 40 percent between 1969 and 1970 but units delivered remained constant. Total commercial transport aircraft exported in 1970 approached \$1.3 billion, a 37 percent increase over 1969.

Helicopter exports during 1970 declined in value and increased in units in comparison with 1969. Units exported were 276 for 1970 over 268 during 1969, an increase of 3 percent. The total value of helicopters exported declined by 32 percent in 1970 compared with 1969, a clear indication that lighter helicopters were required in principal foreign markets.

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 ^r	306,625	104,375	30,540	171,710
1970	308,469	48,297	33,821	226,351

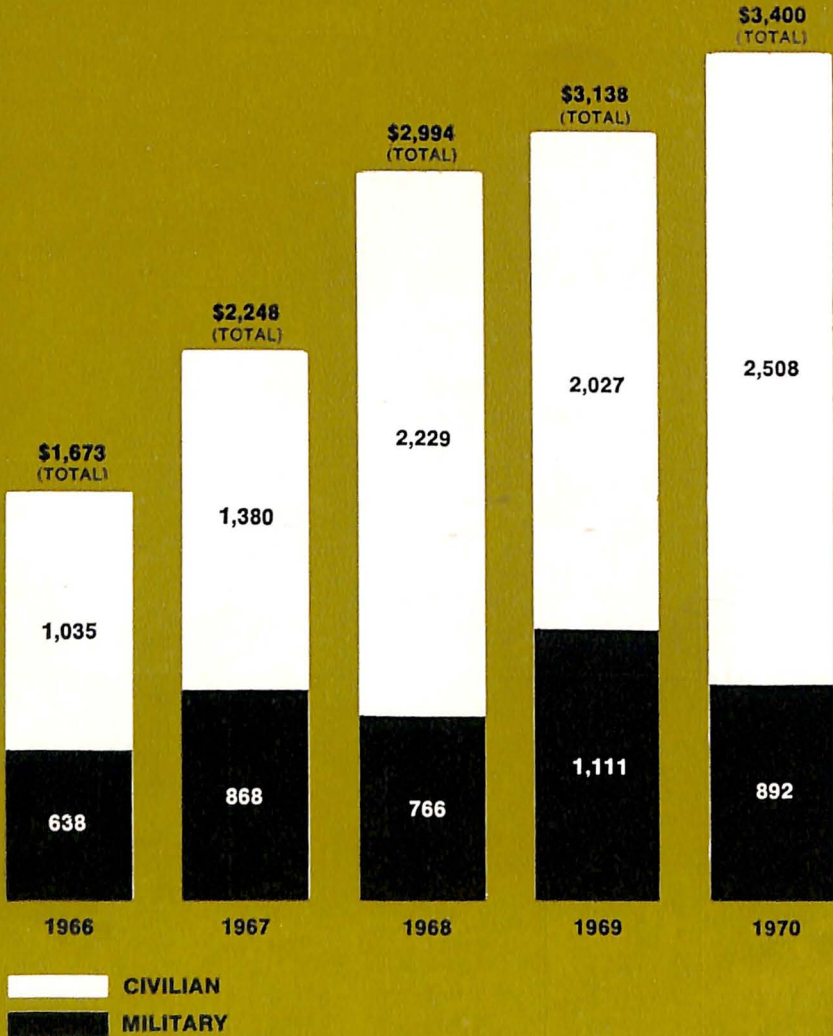
^a Aircraft includes new and used airplanes, seaplanes and amphibians.

^r Revised.

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

AEROSPACE FACTS AND FIGURES, 1971/72

**CIVILIAN AND MILITARY EXPORTS
OF U.S. AEROSPACE PRODUCTS**
(IN MILLIONS OF DOLLARS)



SOURCE: BUREAU OF THE CENSUS

FOREIGN TRADE

EXPORTS OF U. S. AEROSPACE PRODUCTS Calendar Years 1966 to Date (Millions of Dollars)

	Years Ending Dec. 31				
	1966	1967	1968	1969 ^r	1970
GRAND TOTAL	\$1,672.6	\$2,248.1	\$2,994.4	\$3,138.4	\$3,400.0
TOTAL MILITARY	637.5	867.6	765.6	1,111.4	892.1
COMPLETE AIRCRAFT, TOTAL	221.7	323.8	407.9	601.0	467.4
Transports	43.6	130.6	100.6	37.9	81.9
General Aviation.....	1.6	1.2	0.6	0.6	4.2
Rotary.....	17.4	30.0	9.8	32.5	22.3
Fighters & Bombers.....	107.6	115.2	278.6	483.6	330.8
Trainers.....	31.8	15.1	11.0	10.2	12.9
Other, including Used.....	19.7	31.7	7.3	36.2	15.3
ENGINES, TOTAL	31.2	26.4	31.1	50.0	45.8
Jet & Gas Turbine.....	19.8	18.8	24.1	38.1	30.6
Missile Turbine.....	4.1	2.4	3.0	8.0	8.0
Internal Combustion.....	7.3	5.2	4.0	3.9	7.2
PARTS, ACCESSORIES & EQUIP- MENT INCLUDING SPARES, TOTAL ..	250.4	308.8	192.8	303.4	270.5
Engine Spares & Accessories..	72.7	83.8	41.9	58.4	67.5
Other Spares & Equipment...	177.7	225.0	150.9	245.0	203.0
ROCKETS, GUIDED MISSILES & PARTS, TOTAL	134.2	208.6	133.8	157.0	108.4
Complete Rockets & Guided Missiles.....	13.3	34.0	41.6	67.3	7.9
Parts & Accessories for Rock- ets & Guided Missiles.....	120.9	174.6	92.2	89.7	100.5
TOTAL, CIVILIAN	1,035.1	1,380.5	2,228.8	2,027.0	2,507.9
COMPLETE AIRCRAFT, TOTAL	552.4	789.3	1,405.4	1,241.0	1,529.9
Transports, New.....	420.8	611.4	1,200.2	946.9	1,294.7
General Aviation, New.....	89.1	91.2	101.3	125.6	113.5
Rotary Wing, New.....	11.6	25.3	33.0	29.1	27.6
Other, including Used.....	30.9	61.4	70.9	139.4	94.1
ENGINES, TOTAL, NEW & USED ..	77.0	101.2	115.7	102.4	116.1
Jet & Gas Turbine.....	49.3	69.6	92.4	82.0	97.2
Internal Combustion.....	27.7	31.6	23.3	20.4	18.9
PARTS, ACCESSORIES & EQUIP- MENT FOR AIRCRAFT AND EN- GINES, INCLUDING SPARES, TOTAL ..	405.7	490.0	707.7	683.6	861.9
Engine Spares & Accessories..	116.9	132.1	191.0	177.0	197.4
Other Spares & Equipment...	288.8	357.9	516.7	506.6	664.5

^r Revised.

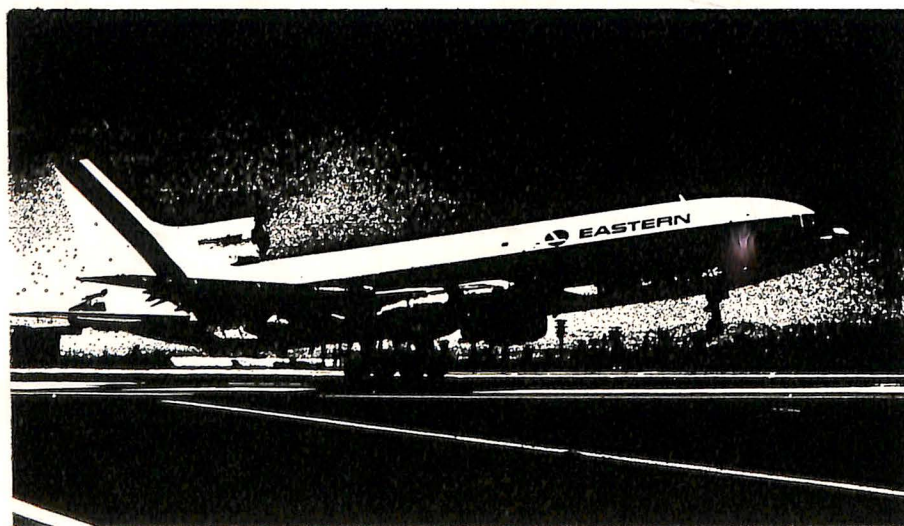
NOTE: For earlier years, see previous editions of "Aerospace Facts and Figures".
Source: Bureau of the Census, "U. S. Exports, Schedule B Commodity and Country", Report FT 410 (Monthly).

AEROSPACE FACTS AND FIGURES, 1971/72

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

Year	TOTAL		33,000 Pounds and Under 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 ^r	182	946.9	17	25.5	165	921.4
1970	187	1,294.7	18	6.8	169	1,287.9

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



FOREIGN TRADE

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		
1949. . . .	510	2.8	235	0.7	275	2.1		
1950. . . .	408	2.2	173	0.5	235	1.7		
1951. . . .	540	3.7	237	1.0	303	2.7		
1952. . . .	815	5.6	551	3.1	264	2.5		
1953. . . .	776	5.4	370	1.5	406	3.9		
1954. . . .	529	4.5	223	1.1	306	3.4		
1955. . . .	748	7.4	296	1.9	453	5.5		
1956. . . .	966	11.0	340	2.5	626	8.5		
1957. . . .	1,086	13.1	368	2.5	718	10.6		
1958. . . .	986	12.1	268	2.2	628	9.9		
1959. . . .	1,033	14.5	384	3.6	639	10.9		
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. . . .	2,045	113.5	1,493	31.5	142	8.6	410	73.4

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

AEROSPACE FACTS AND FIGURES, 1971/72

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

^a Manufacturers' Net Billing Price.

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

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

EXPORTS OF LIGHT TRANSPORTS AND GENERAL AVIATION AIRCRAFT, BY SELECTED U.S. MANUFACTURERS, BY DESTINATIONS, CALENDAR YEAR 1970

Total and Destination	Number	Value ^a (Thousands of Dollars)
TOTAL.....	2,169	\$99,298.2
Canada and Greenland.....	187	7,483.6
Latin America.....	678	30,699.9
Europe.....	822	37,411.2
Asia.....	116	7,058.3
Oceania.....	156	5,898.9
Africa.....	210	10,746.3

^a Manufacturers' Net Billing Price.

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

Source: General Aviation Manufacturers' Association.

FOREIGN TRADE

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

NOTE: Data based on exports for Bell, Fairchild-Hiller, Hughes Tool Co., Sikorsky and Vertol.
^a Manufacturers' Net Billing Price.
 Source: Aerospace Industries Association, company reports.

EXPORTS OF COMMERCIAL HELICOPTERS, BY SELECTED U. S. MANUFACTURERS, BY DESTINATION Calendar Year 1970 (Thousands of Dollars)

Total and Destination	Number	Value ^a
Total.....	276	\$32,825.6
Canada and Greenland.....	56	4,568.0
Latin America.....	63	7,688.4
Europe.....	58	11,533.2
Asia.....	61	5,909.1
Oceania.....	28	2,209.2
Africa.....	10	917.7

^a Manufacturers' Net Billing Price.
 NOTE: Data based on exports for Bell, Fairchild-Hiller, Hughes Tool Co., Sikorsky and Vertol.
 Source: Aerospace Industries Association, company reports.

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 ^r	382	137.7	3	^a	379	137.7
1970	363	95.1	8	2.7	355	92.4

^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).

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 ^r	4,178	102.4	759	82.0	3,419	20.4
1970	3,768	116.1	618	97.2	3,150	18.9

^r Revised.

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

FOREIGN TRADE

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 ^r	2,321	8,712
1970	2,173	8,931

^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).

AEROSPACE FACTS AND FIGURES, 1971/72

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

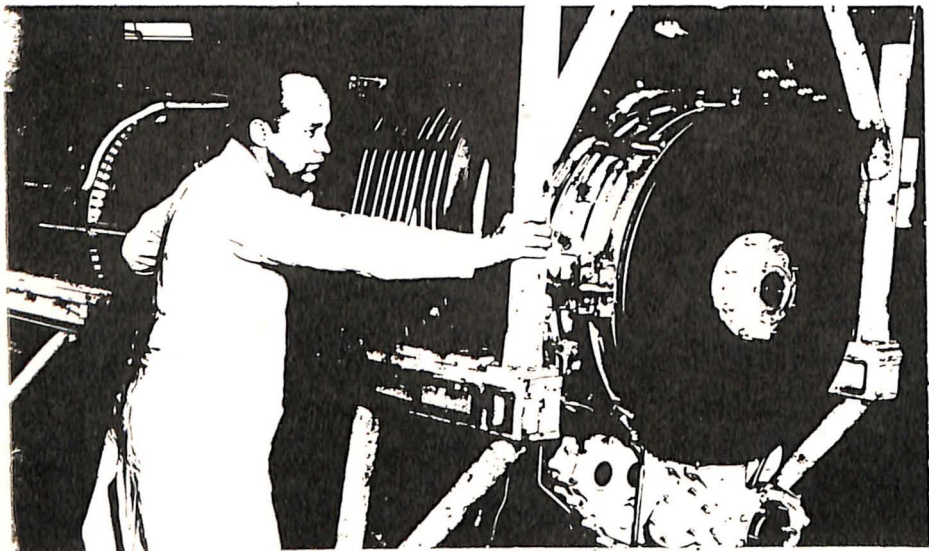
Year Ending Dec. 31	TOTAL	Internal Combustion			Jet and Gas Turbine			Missile Engines and Parts
		Total	Engines	Parts	Total	Engines	Parts	
1958	\$213.5	\$204.6	\$68.5	\$136.1	\$ 8.9	\$ 8.9	N.A.	N.A.
1959	208.0	186.9	43.1	143.8	21.1	21.1	N.A.	N.A.
1960	235.1	184.1	32.5	151.6	51.0	51.0	N.A.	N.A.
1961	279.8	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 ^r	387.8	129.6	24.3	105.3	250.0	120.1	129.9	8.2
1970	428.8	126.2	26.1	100.1	292.0	127.8	164.2	8.6

^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).



FOREIGN TRADE

MUTUAL SECURITY PROGRAM, SHIPMENT OF MILITARY AIRCRAFT FISCAL YEARS 1950 TO DATE

Year Ending June 30	Total	Air Force	Navy
1950	251	} 818	} 283
1951	850		
1952	1,317	1,124	193
1953	2,689	2,274	415
1954	1,170	923	247
1955	1,292	1,136	154
1956	2,659	2,580	79
1957	2,182	2,085	97
1958	1,714	1,565	149
1959	620	528	92
1960	355	317	38
1961	483	427	56
1962	358	341	17
1963	456	439	17
1964	499	409	90
1965	568	488	80
1966	387	379	8
1967	238	214	24
1968	275	257	18
1969	145	145	—
1970	342	342	—
TOTAL ^a	18,850	16,791	2,057

^a October 6, 1949 to Date.
Source: Department of Defense.

AEROSPACE FACTS AND FIGURES, 1971/72

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 (6 mos.)	401.2	381.8	19.4	205.4	200.7	4.7	195.8	181.1	14.7

^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



Despite layoffs resulting from cuts in defense and space expenditures, the aerospace industry in 1970 continued to be the largest U.S. manufacturing employer. Monthly average employment during the year was 1,159,000—a decrease of 195,000 from the average in the previous year.

Most of the fall-off was in missile and space production, where the monthly average was 479,000, down 103,000 from the 1969 figure of 582,000. Aircraft manufacturing, including engines and spare parts, showed a payroll decline of 86,000—from 597,000 in 1969 to 511,000 in 1970. Employment in other industrial classifications involved in missile and

AEROSPACE FACTS AND FIGURES, 1971/72

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	747.6	419.5	182.8	145.3
1960	645.7	350.8	173.6	121.3
1961	619.2	324.3	186.6	108.4
1962	634.6	331.4	199.4	103.9
1963	635.2	332.0	200.7	102.5
1964	605.5	317.8	189.0	98.7
1965	617.8	330.6	187.5	99.7
1966	755.6	420.9	211.1	123.6
1967	823.0	467.6	218.3	137.1
1968	850.9	494.2	208.7	148.1
1969	805.4	479.0	196.5	130.0
1970	689.9	387.8	180.0	122.1
1971				
Feb.	602.5	332.7	165.3	104.5

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. An estimated 162,700 employees in the aircraft and parts industry worked on missiles and spacecraft in December, 1970.

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	458.0	257.4	104.1	96.5
1960	376.8	203.8	96.6	76.4
1961	351.5	178.8	103.9	68.8
1962	350.6	175.9	108.7	65.9
1963	348.4	174.8	107.2	66.4
1964	338.4	175.0	99.1	64.3
1965	352.9	183.3	102.4	67.2
1966	448.0	241.9	121.1	85.0
1967	495.4	272.6	127.8	95.0
1968	505.0	284.5	119.5	100.9
1969	462.9	267.5	109.4	86.1
1970	380.4	206.7	95.0	78.7
1971 Feb.	325.5	170.9	87.2	67.4

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. An estimated 88,600 production workers in the aircraft and parts industry worked on missiles and spacecraft in December, 1970.

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

AEROSPACE FACTS AND FIGURES, 1971/72

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				
Feb.	4.28	4.31	4.31	4.15

NOTE: The production workers surveyed include substantial missile and spacecraft employment. See NOTE page 87.

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				
Feb.	169.49	170.25	168.95	166.83

NOTE: The production workers surveyed include substantial missiles and spacecraft employment. See NOTE page 87.

N.A.—Not available.

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

AEROSPACE FACTS AND FIGURES, 1971/72

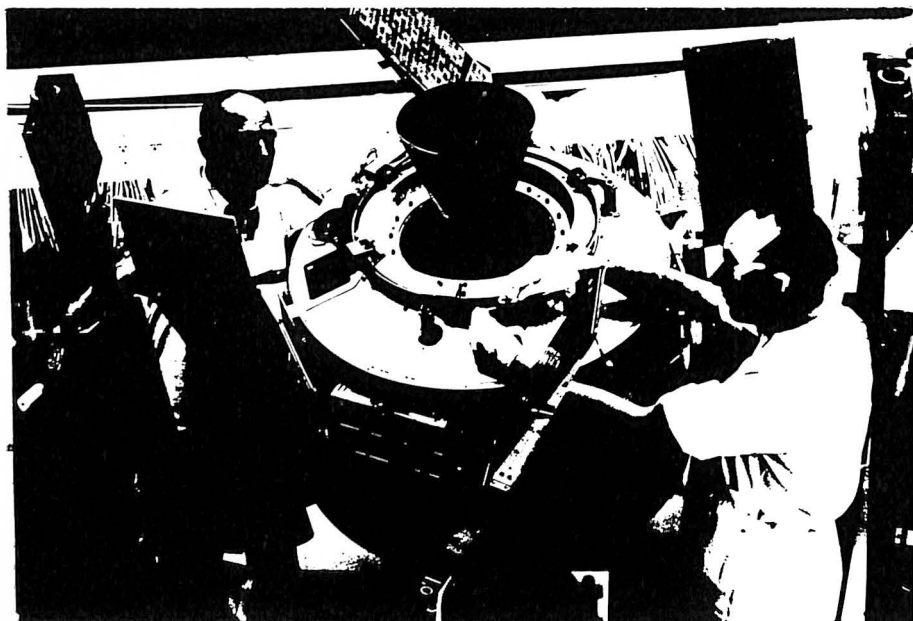
EMPLOYMENT ON NATIONAL AERONAUTICS AND SPACE ADMINISTRATION PROGRAMS 1960 to Date

June	NASA Employees	Contractor Employees	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 ^r	31,350	129,500	160,850
1971 ^E	29,850	108,400	137,250
1972 ^E	28,350	108,700	137,050

^r Revised.

^E Estimate.

Source: The Budget of the United States (Annually); Contractor Employment supplied by NASA.



MANPOWER

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

Year End- ing 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

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

AEROSPACE FACTS AND FIGURES, 1971/72

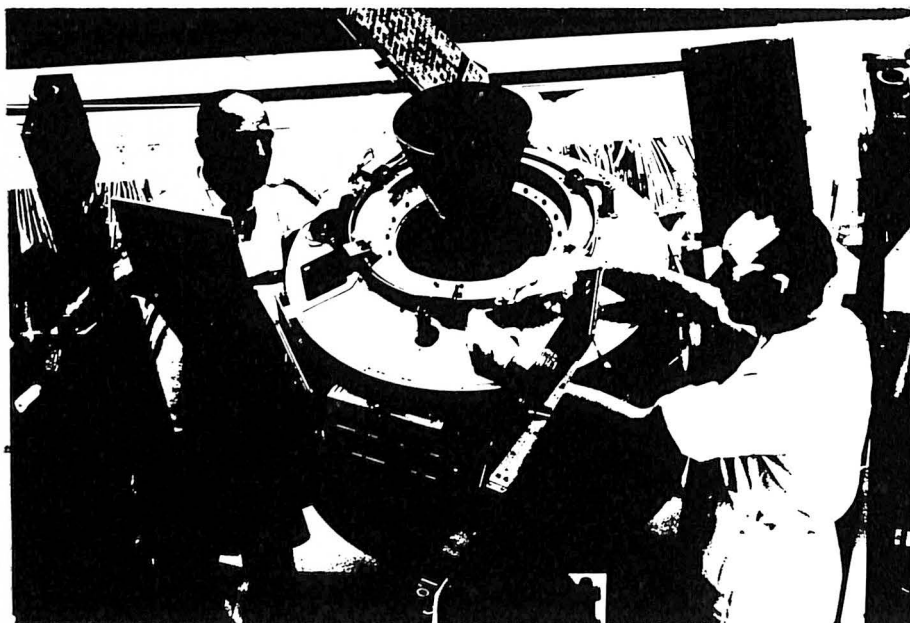
EMPLOYMENT ON NATIONAL AERONAUTICS AND SPACE ADMINISTRATION PROGRAMS 1960 to Date

June	NASA Employees	Contractor Employees	TOTAL EMPLOYMENT
1960	10,268	36,500	46,786
1961	17,077	57,500	74,577
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1964	31,984	347,100	379,084
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1967	33,726	273,200	306,926
1968	32,471	235,400	267,871
1969	31,745	186,600	218,345
1970 ^r	31,350	129,500	160,850
1971 ^E	29,850	108,400	137,250
1972 ^E	28,350	108,700	137,050

^r Revised.

^E Estimate.

Source: The Budget of the United States (Annually); Contractor Employment supplied by NASA.



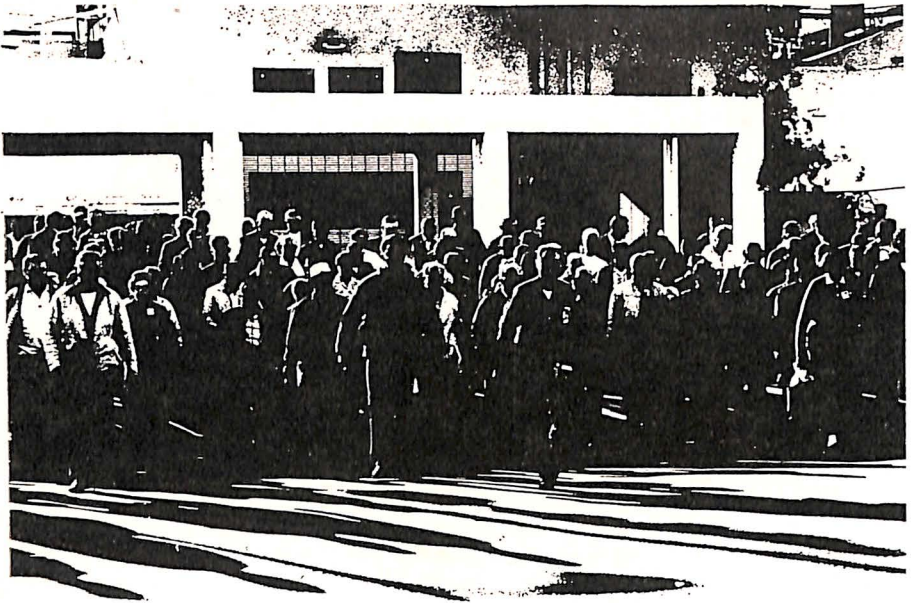
MANPOWER

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

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

AEROSPACE FACTS AND FIGURES, 1971/72



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

^a Defined as the number of disabling injuries per million employee-hours worked.
Source: Department of Labor, Bureau of Labor Statistics.

MANPOWER

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

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.



The financial status of the aerospace industry in Fiscal Year 1970 continued its anticipated downward trend.

The decline in aerospace sales was reported by the Securities and Exchange Commission, based on reports by approximately 70 aerospace companies. The reported total 1970 sales (including sales of non-aerospace products) of \$25.5 billion was down from \$26.4 billion in 1969. This was nearly double the drop between 1968 and 1969. (These figures differ from sales reported in preceding pages because of differences in sources and reporting procedures).

The net profit (after taxes) for the aerospace industry dropped from \$804 million in FY 69 to \$505 million in FY 70. A similar accelerated decrease showed in the amount of net profits retained in business which fell

FINANCE

BALANCE SHEET COMPARISONS, AEROSPACE COMPANIES
1965 to Date
(Millions of Dollars)

	1965	1966	1967	1968	1969	1970
Assets:						
Current Assets						
Cash.....	\$ 395	\$ 369	\$ 460	\$ 576	\$ 763	\$ 758
U.S. Government Securities.....	75	46	16	37	170	9
Total Cash and U.S. Govt. Securities.....	\$ 470	\$ 415	\$ 476	\$ 613	\$ 933	\$ 767
Receivables (total).....	1,788	2,066	2,387	2,840	3,318	3,254
Inventories (gross).....	4,048	5,453	7,550	9,267	11,179	10,763
Other current assets.....	331	302	314	396	435	467
Total Current Assets.....	\$ 6,637	\$ 8,236	\$10,727	\$13,116	\$15,865	\$15,251
Total Net Plant.....	1,670	2,148	2,849	3,542	4,496	4,527
Other Non-Current Assets.....	402	684	1,128	1,674	2,317	2,639
Total Assets.....	\$ 8,709	\$11,068	\$14,704	\$18,332	\$22,678	\$22,417
Liabilities:						
Current Liabilities						
Short term loans.....	339	670	1,055	789	1,132	1,146
Advances by U.S. Govt.....	1,868	2,446	3,578	4,317	5,135	4,241
Trade accounts and notes payable.....	835	1,098	1,391	1,922	2,303	2,212
Federal income taxes accrued..	252	256	229	304	365	455
Installments due on long term debts.....	45	61	88	110	186	338
Other current liabilities.....	1,043	1,369	1,558	1,906	2,213	2,148
Total current liabilities.....	\$ 4,382	\$ 5,900	\$ 7,899	\$ 9,348	\$11,334	\$10,540
Long Term Debt.....	807	1,094	1,897	2,668	3,618	4,113
Other Non-Current Liabilities...	67	100	186	279	412	514
Total Liabilities.....	\$ 5,256	\$ 7,094	\$ 9,982	\$12,295	\$15,364	\$15,167
Stockholders' Equity:						
Capital Stock.....	1,312	1,488	1,785	2,254	2,505	2,491
Earned Surplus and Reserves....	2,142	2,486	2,937	3,783	4,807	4,757
Total Net Worth.....	\$ 3,454	\$ 3,974	\$ 4,722	\$ 6,037	\$ 7,312	\$ 7,248
Total Liabilities and Stock- holder's Equity.....	\$ 8,709	\$11,068	\$14,704	\$18,332	\$22,678	\$22,417
Net Working Capital.....	\$ 2,256	\$ 2,336	\$ 2,828	\$ 3,768	\$ 4,531	\$ 4,711

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

Source: Securities & Exchange Commission—Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations."

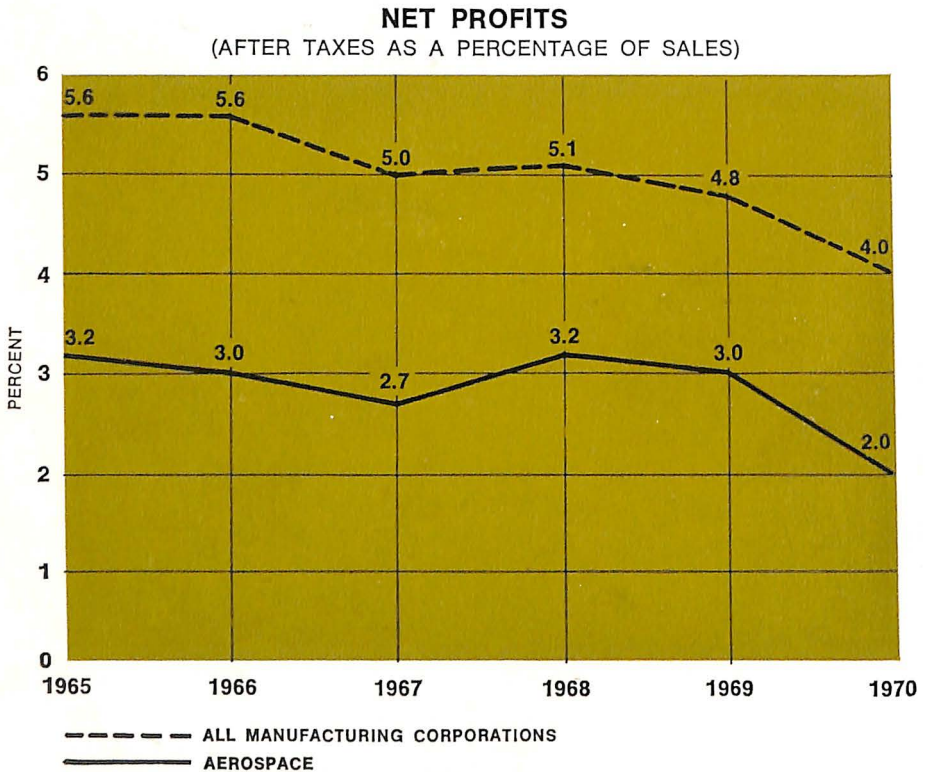
AEROSPACE FACTS AND FIGURES, 1971/72

from \$467 million in FY 69 to \$237 million in FY 70. The ratio of profits to sales (after taxes) dropped by one-third, from 3.0 percent in FY 69 to 2.0 percent in FY 70. This is only half of the 4.0 percent average for all manufacturing.

The value of industry stockholders' equity, which had increased by 21 percent between FY 68 and FY 69, declined from \$7,312 million to \$7,248 million during FY 70. Continuing a trend of several years' duration, net working capital was increased from \$4,531 million in FY 69 to \$4,711 million in FY 70. This increase in net working capital was a positive gain in the financial picture of the aerospace industry.

Short-term debt grew slightly from \$1,132 million last year to \$1,146 million in FY 70, and long-term debt was increased from \$3,618 million to \$4,113 million during FY 70.

Reversing a trend that had shown an annual increase during recent years, total assets declined during FY 70 from \$22,678 million to \$22,417 million, a decrease of 1.2 percent.



SOURCE: SECURITIES AND EXCHANGE COMMISSION
FEDERAL TRADE COMMISSION

FINANCE

TAXES AND PROFITS, AEROSPACE COMPANIES
1956 to Date

Year	Net Federal Taxes as a Percent of Total Income	Net Profit After Taxes as a Percent of Sales
1956	52.3	3.1
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

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

INCOME ACCOUNTS, AEROSPACE COMPANIES
1963 to Date
(Millions of Dollars)

	1963	1964	1965	1966	1967	1968	1969	1970
Net Sales	\$15,313	\$15,403	\$16,073	\$19,224	\$22,739	\$26,852	\$26,392	\$25,505
Net Profit from Operations	695	756	997	1,076	1,152	1,661	1,493	980
Total Income before Federal Income Taxes	665	748	984	1,046	1,099	1,606	1,433	881
Provision for Federal In- come Taxes	316	351	460	473	489	749	629	380
Net Profit after Taxes	350	395	524	572	610	857	804	501
Net Profit Re- tained in Business	214	241	339	380	382	552	467	237

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

AEROSPACE FACTS AND FIGURES, 1971/72

Federal income tax payments by aerospace companies in 1970 were \$380 million, which amounted to 43.1 percent of the industry's total net income. This continued the preceding year's trend when \$629 million in taxes represented 43.9 percent of income. But while 1969's federal income tax payments were 16 percent below those paid in 1968, the decline from 1969 to 1970 was 40 percent.

The other declining figures are reflected in the industry's plans for new

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 ^a	83.13	31.86	15.40	0.50

^a Plans according to a survey conducted in January and February 1971.
Sources: 1947-1967: U.S. Department of Commerce, Survey of Current Business, January 1970, p. 25;
1968-1970: U.S. Department of Commerce, U.S. Securities and Exchange Commission, Joint Statistical
Report OBE 71-13, SEC 2505, March 9, 1971.

FINANCE

MILITARY PRIME CONTRACT AWARDS OF \$10,000 OR MORE FOR SELECTED MAJOR MILITARY HARD GOODS, BY GEOGRAPHIC REGION Fiscal Years 1968-1970

Program and Region	Million Dollars			Percent of Program Total		
	FY 1968	FY 1969	FY 1970	FY 1968	FY 1969	FY 1970
AIRCRAFT	\$9,644	\$8,335	\$6,993	100.0	100.0	100.0
New England	1,791	1,308	955	18.6	15.7	13.7
Middle Atlantic	1,266	927	988	13.1	11.1	14.1
East North Central	1,080	1,154	682	11.2	13.8	9.7
West North Central	876	746	742	9.1	9.0	10.6
South Atlantic	980	1,070	1,060	10.2	12.8	15.2
South Central	2,577	2,083	1,727	26.7	25.0	24.7
Mountain	74	58	69	0.8	0.7	1.0
Pacific	999	988	769	10.4	11.9	11.0
Alaska and Hawaii	1	1	1	<i>a</i>	<i>a</i>	<i>a</i>
MISSILE AND						
SPACE SYSTEMS	\$4,945	\$5,474	\$5,021	100.0	100.0	100.0
New England	577	702	605	11.7	12.8	12.0
Middle Atlantic	548	754	640	11.1	13.8	12.8
East North Central	200	128	128	4.0	2.3	2.6
West North Central	151	121	131	3.0	2.2	2.6
South Atlantic	516	499	508	10.4	9.1	10.1
South Central	143	125	100	2.9	2.3	2.0
Mountain	261	317	305	5.3	5.9	6.1
Pacific	2,528	2,826	2,602	51.1	51.6	51.8
Alaska and Hawaii	21	2	2	0.4	<i>a</i>	<i>a</i>
ELECTRONICS AND						
COMMUNICATION						
EQUIPMENT	\$3,980	\$4,036	\$3,519	100.0	100.0	100.0
New England	552	486	444	13.9	12.1	12.6
Middle Atlantic	1,095	1,026	797	27.5	25.4	22.7
East North Central	409	447	290	10.3	11.1	8.2
West North Central	192	221	154	4.8	5.5	4.4
South Atlantic	520	596	622	13.1	14.8	17.7
South Central	254	262	265	6.4	6.5	7.5
Mountain	109	96	88	2.7	2.4	2.5
Pacific	833	873	823	20.9	21.6	23.4
Alaska and Hawaii	16	29	36	0.4	0.7	1.0

^a Less than 0.05%.

Source: Department of Defense, Office of the Secretary of Defense, Directorate For Information Operations, "Military Prime Contract Awards by Region and State, Fiscal Years 1968, 1969, 1970".

AEROSPACE FACTS AND FIGURES, 1971/72

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 1970
(Dollar Figures in Millions)

Region	TOTAL		Type of Contractor					
			Educational Institutions		Other Non-Profit Institutions ^a		Business Firms	
	Million Dollars	Percent	Million Dollars	Percent	Million Dollars	Percent	Million Dollars	Percent
TOTAL	\$5,387	100.0	\$356	100.0	\$286	100.0	\$4,745	100.0
New England	529	9.8	107	30.0	40	14.0	382	8.1
Middle Atlantic	1,072	19.9	43	11.9	27	9.5	1,002	21.1
East North Central	295	5.5	36	10.2	20	7.2	238	5.0
West North Central	230	4.3	9	2.4	2	0.6	220	4.6
South Atlantic	714	13.2	87	24.4	52	18.2	575	12.1
South Central	266	4.9	14	4.0	7	2.3	246	5.2
Mountain	170	3.2	18	5.1	7	2.4	145	3.1
Pacific	2,090	38.8	38	10.8	131	45.8	1,921	40.5
Alaska and Hawaii	21	0.4	4	1.2	*	**	16	0.3

^a Includes contracts with other government agencies.

* Less than \$500,000.

** Less than 0.05%.

Source: Department of Defense, Office of the Secretary of Defense, Directorate for Information Operations, "Military Prime Contract Awards by Region and State, Fiscal Years 1968, 1969, 1970.

plant and equipment in 1971. The aerospace industry estimate of \$500 million is down slightly from 1970 when aerospace companies cut back from an estimate of \$720 million to an actual figure of \$550 million.

There also was a geographical shift in the spread of military prime contract awards of \$10,000 or more for aircraft, missile and space systems, and electronics and communication equipment between FY 69 and FY 70. The Pacific region gained .7 of one percent and remained in first place with 27 percent of the total. The Middle Atlantic region gained .4 of one percent to remain in second place with 15.6 percent of the business. The greatest change was registered in the South Atlantic region where an increase of 2.0 percent to a share of 14.1 percent earned third place over the South Central and Northeast regions which dropped to fourth and fifth, respectively. The largest drop was 2.6 percent in the East North Central region which stayed in sixth place with a 7.1 percent share.

Contract dollars for research, development, test and engineering followed the same general pattern with the Pacific, Middle Atlantic, South Atlantic and Northeast regions placing in that order at the head of the list.

FINANCE

MAJOR DEFENSE CONTRACTORS (Listed by rank according to net value of military prime contracts awarded July 1, 1969-June 30, 1970) (Millions of Dollars)

Company	July 1, 1965 to June 30, 1966	July 1, 1966 to June 30, 1967	July 1, 1967 to June 30, 1968	July 1, 1968 to June 30, 1969	July 1, 1969 to June 30, 1970
U. S. TOTAL, ALL CONTRACTS	\$33,532.6	\$39,219.4	\$38,826.6	\$25,175.2	\$31,314.6
Lockheed Aircraft Corp.	1,531.0	1,807.2	1,870.2	2,040.2	1,847.7
General Dynamics Corp.	1,136.0	1,831.9	2,239.3	1,243.1	1,183.2
General Electric Co.	1,187.0	1,289.8	1,488.7	1,620.8	1,000.5
American Telephone & Telegraph Co.	672.1	673.0	775.9	914.6	931.2
McDonnell Douglas Corp. ^a	722.2	2,124.6	1,100.8	1,069.7	882.7
United Aircraft Corp.	1,138.7	1,097.1	1,329.0	997.4	873.8
North American Rockwell Corp. ^b	520.4	688.8	668.6	674.2	707.1
Grumman Corp.	322.9	487.7	629.2	417.1	660.8
Litton Industries, Inc.	219.4	180.3	465.7	317.0	543.1
Hughes Aircraft Co.	336.6	419.5	286.1	439.0	496.9
Ling Temco Vought Inc.	310.8	534.7	753.8	914.1	479.3
Boeing Co.	914.5	911.7	762.1	653.6	474.7
Textron Inc.	554.8	496.6	500.7	428.3	430.9
Westinghouse Electric Corp.	348.7	453.1	251.0	429.6	417.7
Sperry Rand Corp.	426.8	484.1	447.2	467.9	398.9
Honeywell Inc.	250.6	313.7	351.7	435.6	397.9
General Motors Corp.	508.0	625.1	629.6	584.4	385.7
Raytheon Co.	356.7	403.3	451.8	546.8	379.6
Ford Motor Co.	439.6	403.8	381.3	396.3	345.9
Avco Corp.	506.0	448.6	583.6	456.1	269.7
American Motors Corp.	c	c	c	c	266.3
RCA Corp.	242.4	268.4	255.0	299.0	262.8
General Tire & Rubber Co.	327.3	273.1	248.1	263.5	261.8
International Business Machines.	181.6	194.9	223.7	256.6	256.1
Raymond Morrison Knudsen	547.9	462.5	165.0	254.0	256.0
Martin Marietta Corp.	337.8	290.2	393.5	264.3	250.9
Tenneco Inc.	c	c	c	236.7	248.9
Olin Corp.	173.0	154.3	329.4	354.4	247.7
Teledyne Inc.	62.3	87.8	92.5	308.5	238.4
Standard Oil Co. (New Jersey)	214.0	235.1	274.4	291.1	229.2

^a Combined data for McDonnell and Douglas for earlier years.

^b North American only before FY 1968.

^c Not included in "100 Companies".

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

AEROSPACE FACTS AND FIGURES, 1971/72

MAJOR NATIONAL AERONAUTICS AND SPACE ADMINISTRATION CONTRACTORS
(Listed by rank according to net value of NASA prime contracts
awarded July 1, 1969 to June 30, 1970)
(Millions of Dollars)

Company	Fiscal Years Ending				
	June 30, 1966	June 30, 1967	June 30, 1968	June 30, 1969	June 30, 1970
U.S. TOTAL ALL CONTRACTS	\$2,381.8	\$3,864.1	\$3,446.7	\$3,022.3	\$2,759.2
North American					
Rockwell ^a	682.8	983.8	838.7	680.9	531.5
Grumman Aerospace	356.8	481.1	394.1	369.2	284.4
McDonnell Douglas ^b	139.0	243.9	209.0	207.5	236.3
Boeing Company	187.9	273.5	296.7	228.7	158.6
International Business Machines	130.5	186.4	147.7	112.5	133.4
General Electric Co.	104.6	179.3	190.7	150.1	131.7
Bendix Corp.	71.0	120.0	123.8	127.6	109.8
Martin Marietta Corp.	5.8	12.8	26.8	56.0	108.0
Aerojet-General Corp.	42.0	95.7	67.1	64.9	71.6
TRW, Inc.	23.8	52.6	52.4	50.0	58.3
RCA Corp.	30.1	57.5	63.2	51.6	54.5
Sperry Rand Corp.	22.9	38.7	31.8	34.1	48.1
Lockheed Aircraft Corp.	24.0	42.0	40.5	39.8	41.0
General Dynamics Corp.	24.0	61.0	54.4	34.0	38.0
Trans World Airlines	14.1	25.1	25.3	35.4	36.0
Service Technology Corp.	^d	^d	^d	26.2	27.5
United Aircraft Corp. Federal Electric Corp.	16.1	40.0	18.1	26.2	27.1
Philco-Ford Corp.	10.0	12.3	22.0	27.0	26.3
General Motors Corp.	17.7	32.1	32.0	22.4	24.0
LTV Aerospace Corp.	50.1	65.2	46.8	30.9	20.4
Chrysler Corp.	21.1	46.3	42.7	18.3	17.9
Brown-Northrop (Joint Venture)	51.6	76.6	62.6	42.5	16.7
ILC Industries, Inc.	6.9	10.0	14.5	12.7	16.6
Singer-General Precision, Inc. ^c	^d	6.3	8.1	12.2	13.0
Honeywell, Inc.	15.4	25.0	12.4	9.7	12.3
Bellcomm, Inc.	10.8	22.6	15.7	8.1	11.5
Computer Sciences Corp.	7.6	9.3	10.0	10.1	11.0
Brown Engineering Co., Inc.	7.3	11.8	11.8	8.3	11.0
American Science & Engineering, Inc.	7.4	16.7	16.3	11.1	9.9
Engineering, Inc.	1.7	4.2	6.5	8.4	9.8

^a North American only before FY 1968.

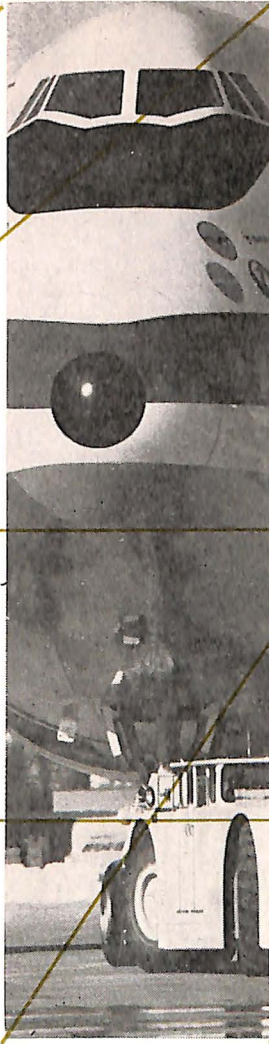
^b Combined data for McDonnell and Douglas.

^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



U.S. scheduled airlines during 1970 flew 2,415 million revenue miles, only a slight increase over the 2,385 million revenue miles flown in 1969.

Despite the slight increase in operations, the financial plight of the air carriers worsened with losses totalling nearly \$179 million.

Stuart G. Tipton, president of the Air Transport Association, provided this explanation:

“An economic recession hit the U.S. and just at the time the airlines brought in, on a schedule set up some years ago, additional capacity. . . . At the same time these trends bumped into each other, the cost of everything that the airlines buy went zooming up at a rate even faster than the inflation rate of the nation as a whole.

The most serious cost problem for the industry has been labor, which

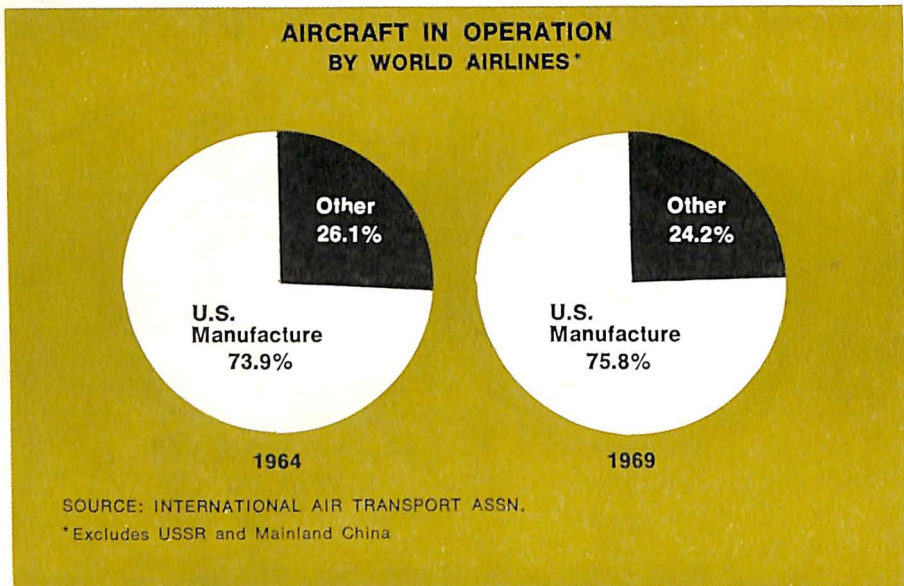
AEROSPACE FACTS AND FIGURES, 1971/72

accounts for almost one-half of airline costs. Average wages shot up last year (1970) by about 15 percent—among the highest increases in all industry. This fact, along with the rapidly rising costs of items such as fuel, landing fees and interest rates, resulted in an overall inflation rate of about 9 percent, almost twice the national average.”

In world airline operations, excluding the U.S.S.R. and China, the carriers flew 4,405 million miles in scheduled and international operations. These carriers flew 307 million passengers compared with 290 million in 1969.

The world airlines during 1970 operated 3,999 aircraft of which 3,030 (76 percent) were manufactured in the U.S.

U.S. air lines operated a total of 2,586 aircraft of which 2,239 were turbine-powered.



AIR TRANSPORTATION

U. S. MANUFACTURED AIRCRAFT IN OPERATION ON WORLD AIRLINES Calendar Years 1963 to Date

	1963	1964	1965	1966	1967	1968	1969
TOTAL, MANUFACTURED IN U. S.	2,266	2,317	2,548	2,556	2,735	2,890	3,030
4 Engine	1,434	1,417	1,493	1,410	1,424	1,374	1,428
Turbojets	580	627	738	825	941	1,102	1,221
Boeing 707	206	233	291	365	467	547	600
Boeing 720/720B	107	109	119	118	121	119	113
Boeing 747	—	—	—	—	—	—	4
McDonnell Douglas DC-8	183	199	236	254	276	372	437
Convair 880	53	53	52	53	58	48	47
Convair 990	31	33	40	35	19	16	20
Turboprops	137	137	136	136	127	85	62
Lockheed Electra	137	137	136	133	124	82	59
Lockheed L-100 Hercules	—	—	—	3	3	3	3
Piston Engine	717	655	619	449	356	187	145
Lockheed Constellation	179	176	136	83	31	10	3
Douglas DC-7	178	133	85	47	23	5	3
Douglas DC-6	257	250	265	210	193	76	72
Douglas DC-4	103	96	132	109	109	96	67
Boeing Stratocruiser	—	—	1	—	—	—	—
3 Engine	4	97	193	309	441	561	671
Boeing 727 (turbojet)	4	97	193	309	441	561	671
2 Engine	783	754	803	791	836	925	902
Turbojets	—	—	4	59	176	392	498
Boeing 737	—	—	—	—	—	70	124
Lear Jet 24	—	—	—	—	—	1	1
McDonnell Douglas DC-9	—	—	4	59	176	324	373
Turboprops	7	7	7	18	28	34	26
Fairchild F-27/F-227	7	7	7	18	22	23	21
Convair 640/580	—	—	—	—	6	10	5
Beechcraft 99	—	—	—	—	—	1	—
Piston Engine	776	747	792	714	632	499	378
Convair 240, 340, 440	228	201	190	177	161	120	100
Martin 202, 404	4	—	4	—	—	—	—
Curtiss Commando C-46	37	38	57	56	44	23	18
Douglas DC-3/C-47	479	471	481	441	391	320	237
Other	28	37	60	40	36	36	23
1 Engine	18	19	21	13	10	12	14
Helicopters	27	30	38	33	24	18	15
ALL MANUFACTURERS							
GRAND TOTAL	3,086	3,137	3,461	3,541	3,725	3,903	3,999
Per Cent of Grand Total							
Manufactured in U. S.	73.4	73.9	73.6	72.2	73.4	74.0	75.8

NOTE: Excludes U.S.S.R. and China.
Source: International Air Transport Association, "World Air Transport Statistics" (Annually). Based on reports by IATA members.

AEROSPACE FACTS AND FIGURES, 1971/72

U. S. CIVIL AND JOINT-USE AIRPORTS
By Length of Runway and Region^a
January 1, 1970

FAA Region	TOTAL	Airports by Length of Runway (in feet)		
		Under 5,000	5,000- 9,999	10,000 & over
TOTAL	11,050	9,622	1,184	244
Eastern.....	2,310	2,067	194	49
Southern ^b	1,218	1,043	163	12
Central.....	3,102	2,849	213	40
Southwest.....	1,663	1,453	181	29
Western.....	1,997	1,645	320	32
Alaskan.....	691	511	100	80
Pacific.....	59	52	6	1
Outside U. S. ^c	10	2	7	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.

WORLD AIRLINE PASSENGER MILES*
(IN MILLIONS)



SOURCE: INTERNATIONAL CIVIL AVIATION ORGANIZATION

* Excludes USSR and Mainland China

AIR TRANSPORTATION

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	Cargo Ton-Miles	Mail Ton-Miles
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	390	130
1951	1,005	42	22,000	630	160
1953	1,205	52	29,500	725	190
1955	1,425	68	38,000	905	255
1956	1,580	77	44,000	1,030	275
1957	1,765	86	51,000	1,125	295
1958	1,820	88	53,000	1,150	320
1959	1,920	99	61,000	1,330	355
1960	1,930	106	67,500	1,480	415
1961	1,940	111	72,500	1,700	490
1962	2,015	121	80,500	1,995	555
1963	2,130	135	91,500	2,230	590
1964 ^r	2,300	155	106,000	2,680	625
1965 ^r	2,550	177	123,000	3,400	755
1966	2,790	200	142,000	4,010	1,050
1967	3,290	233	169,500	4,590	1,295
1968 ^r	3,730	262	192,500	5,555	1,610
1969 ^r	4,160	290	217,000	6,820	1,720
1970	4,405	307	240,500	7,375	1,875

N.A.—Not available.

NOTE: Excludes China (mainland) and the U.S.S.R.

Source: International Civil Aviation Organization, "Development of Civil Air Transport, Total Scheduled Services-Revenues Traffic" (Annually).

AEROSPACE FACTS AND FIGURES, 1971/72

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	153,408	104,156.0	16,260	27,563.2

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.

AIR TRANSPORTATION

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	2,415	170	131,719	3,862	1,484

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.

Source: Civil Aeronautics Board.

AEROSPACE FACTS AND FIGURES, 1971/72

COMPOSITION OF U. S. AIR LINE FLEET, BY TYPE OF AIRCRAFT, NUMBER OF ENGINES, AND MODEL, JANUARY 1, 1969, 1970 AND 1971
(Number of Aircraft)

Type of Aircraft, Number of Engines, and Model	1971	1970	1969
TOTAL AIRCRAFT.....	2,679	2,690	2,586
Total fixed-wing.....	2,663	2,672	2,570
Turbine-powered—total.....	2,510	2,448	2,239
Four-engine—total.....	1,041	997	983
Turbojet—total.....	931	886	816
Boeing 707.....	406	428	393
Boeing 720.....	115	127	134
Boeing 747.....	79	1	—
Convair 880.....	41	41	41
Convair 990.....	5	6	11
McDonnell Douglas DC-8.....	285	283	237
Turboprop—total.....	110	111	167
Armstrong Whitworth Argosy AW-650.....	8	8	7
Canadair CL-44.....	8	9	14
Lockheed 188.....	69	73	114
Lockheed 382.....	22	18	13
Vickers Viscount 745.....	3	3	19
Three-engine—total.....	659	628	543
Turbojet—total.....	659	628	543
Boeing 727.....	659	628	543
Twin-engine—total.....	805	818	706
Turbojet—total.....	546	554	422
Boeing 737.....	149	147	76
British Aircraft Corp. BAC-111.....	59	60	60
Sud Aviation Caravelle SE-210.....	—	20	20
McDonnell Douglas DC-9.....	337	327	266
Hamburger Flugzeugbau HF-320.....	1	—	—
Turboprop—total.....	259	264	284
Convair 240T.....	24	24	36
Convair 340T.....	108	119	113
Convair 640.....	10	—	—
DeHavilland DH/DH-C.....	6	9	6
Fairchild F-27.....	37	38	48
Fairchild FH-227.....	47	53	55
Grumman G-159.....	1	1	1
Grumman G21T.....	—	1	2
Nord 262.....	—	—	12
Short SC-7.....	2	2	2
Nihon YS-11.....	21	17	9
Beech 99.....	3	—	—

(Continued on next page)

AIR TRANSPORTATION

COMPOSITION OF U. S. AIR LINE FLEET, BY TYPE OF AIRCRAFT, NUMBER OF ENGINES AND MODEL, JANUARY 1, 1969, 1970 AND 1971—*Continued*
(Number of Aircraft)

Type of Aircraft, Number of Engines, and Model	1971	1970	1969
Single-engine turboprop—total.....	5	5	7
Pilatus PC-6A.....	2	2	3
Pilatus PC-6B.....	3	3	4
Piston-powered—total.....	153	224	331
Four-engine—total.....	34	64	82
Boeing 377.....	2	1	—
Douglas DC-4.....	8	11	8
Douglas DC-6.....	17	33	40
Douglas DC-7.....	6	14	29
Lockheed 049/149.....	—	—	4
Lockheed 749.....	1	1	1
Lockheed 1049/1649.....	—	4	—
Twin-engine—total.....	110	153	234
Aero Commander 680E.....	1	1	1
Convair 28-5-ACF.....	—	2	4
Convair 240.....	—	1	3
Convair 340/440.....	6	7	46
Curtiss C-46.....	42	43	44
Douglas DC-3.....	22	37	56
Fairchild C82.....	2	2	4
Grumman G-21.....	12	11	17
Grumman G-44.....	2	3	3
Grumman G-73.....	1	1	1
Grumman SA-16.....	—	2	2
Martin 202.....	1	1	2
Martin 404.....	19	38	47
Other.....	2	4	4
Single-engine—total.....	9	7	15
Rotary Wing—total.....	16	18	16
Turbine-powered—total.....	13	15	13
Sikorsky S-61.....	6	8	8
Sikorsky S-62.....	—	—	1
Vertol V-107-II.....	4	4	4
Bell BL-206.....	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).

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

^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.

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

^a Includes data for system trunk and local service carriers only.
Source: Civil Aeronautics Board.

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 (including 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 ^r	5,606	4,913	182	343	9	159
1969	6,438	5,662	186	401	10	179

^a Includes Intra-Alaska, Intra-Hawaii, Helicopter and other carriers.

^r Revised.

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

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 ^r	5,606	5,298	308
1969	6,438	6,156	282

^a Includes Intra-Alaska, Intra-Hawaii, Helicopter and other carriers.

^r Revised.

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, 1971/72

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
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

^a Less than 0.5 per cent.

Source: Federal Aviation Administration, "General Aviation Statistics", October 1970.

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

^E Estimate.

^a Includes special certificates issued to foreign nationals.

Source: Federal Aviation Administration, Office of Management Systems.



AEROSPACE FACTS AND FIGURES, 1971/72

ELIGIBLE 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		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	

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



A marked increase in the number of law enforcement agencies using helicopters was shown in 1970.

A survey conducted by the Aerospace Industries Association of the commercial—executive and civil government helicopter operators in the United States and Canada reported a total of 1,424 operators and 3,874 helicopters operated. This is an increase of 3 percent in the number of operators and 13 percent in the number of helicopters operated compared with the 1969 totals.

The largest increase—71 percent—was in the number of civil government agencies that operate helicopters. Law enforcement agencies, especially city and highway police departments, have found the helicopter uniquely effective for crime control.

An increase in the number of heliports and helistops is reported in the 1970 AIA Directory of Heliports, Helistops in the U.S., Canada and Puerto Rico. The Directory lists 2,310 heliports/helistops. This is an increase of 22 percent of the 1968 totals.

In 1965, there were 34 hospital heliports in the country. By 1970, there were 285 landing facilities for today's aerial ambulance—the medicopter—to transport highway accident victims to the hospital.

It is significant to note that of the 2,310 heliports listed, 746 of these are for public-use, while 1,564 are for private use. Today's airport congestion and highway traffic have generated a new interest in the utilization of helicopters as city-center to city-center transports. With public-use, downtown and suburban heliports, helicopters can provide this service above the traffic on the ground and below the traffic on the airway.

AEROSPACE FACTS AND FIGURES, 1971/72

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

Source: Civil Aeronautics Board.

AIR TRANSPORTATION

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

^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.

AEROSPACE FACTS AND FIGURES, 1971/72

HELIPORTS AND HELISTOPS
IN THE UNITED STATES, CANADA, AND PUERTO RICO
1963 to Date

Region	1963	1964	1965	1966	1968	1970
TOTAL.....	797	1,000	1,118	1,225	1,892	2,310
(elevated).....	N.A.	N.A.	(95)	(125)	(158)	(216)
New England.....	67	95	88	93	138	93
Middle Atlantic.....	90	148	179	203	346	514
East North Central...	169	151	122	139	258	293
West North Central...	26	36	47	43	81	107
South Atlantic.....	54	83	97	105	157	192
East South Central...	13	20	25	28	41	47
West South Central...	73	87	116	118	195	205
Mountain.....	60	77	78	92	126	157
Pacific.....	203	262	320	358	470	593
Other.....	42	42	46	46	80	109

N.A.—Not available.

NOTE: Data for 1967 and 1969 are not available.

Source: Aerospace Industries Association.

HOSPITAL HELIPORTS
IN THE UNITED STATES, BY REGION
1965 to Date

	1965	1966	1967 ^a	1968 ^b	1969 ^c	1970 ^d
TOTAL.....	34	67	88	147	161	285
New England.....	1	2	2	2	2	5
Middle Atlantic.....	4	8	10	19	22	29
East North Central....	1	12	14	50	52	74
West North Central....	—	1	2	4	4	18
South Atlantic.....	10	13	16	19	24	33
East South Central	—	1	1	1	1	5
West South Central	9	13	16	16	17	20
Mountain.....	1	3	8	9	11	24
Pacific.....	8	14	19	27	28	73
Other.....	—	—	—	—	—	4

^a In addition to those in operation, 21 are proposed.

^b In addition to those in operation, 39 are proposed.

^c In addition to those in operation, 34 are proposed.

^d In addition to those in operation, 45 are proposed.

Source: Aerospace Industries Association.

AIR TRANSPORTATION

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
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

NOTE: Includes United States and Canada.

^a Federal, state and local governments.

Source: Aerospace Industries Association, manufacturers' and 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, formerly Aircraft Industries Association.
- 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 and guided missiles.
- Aircraft Industry:** the industry primarily engaged in the manufacture of aircraft, aircraft engines and parts, aircraft propellers and parts, and aircraft parts and auxiliary equipment. 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.
- 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 actual disbursements or payments. They consist generally of checks issued and cash paid. The trans-

GLOSSARY

actions of business-type activities which generate their own receipts are normally recorded as net expenditures—that is, the excess of disbursements over receipts. If receipts exceed disbursements, the result is shown as a negative expenditure.

FAA: Federal Aviation Administration (formerly the Federal Aviation Agency).

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, e.g., the 1967 fiscal year begins on July 1, 1966, and ends June 30, 1967; abbreviated FY.

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.

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.

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.

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 departments and agencies to pay out money—as distinct from the actual payments made for products, services, loans or other purposes.

The amounts must be within the maximum amounts provided by Congress.

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.

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.

STOL: short takeoff and landing aircraft.

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 fluid 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 or short takeoff and landing aircraft.

VTOL: vertical takeoff and landing aircraft.

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