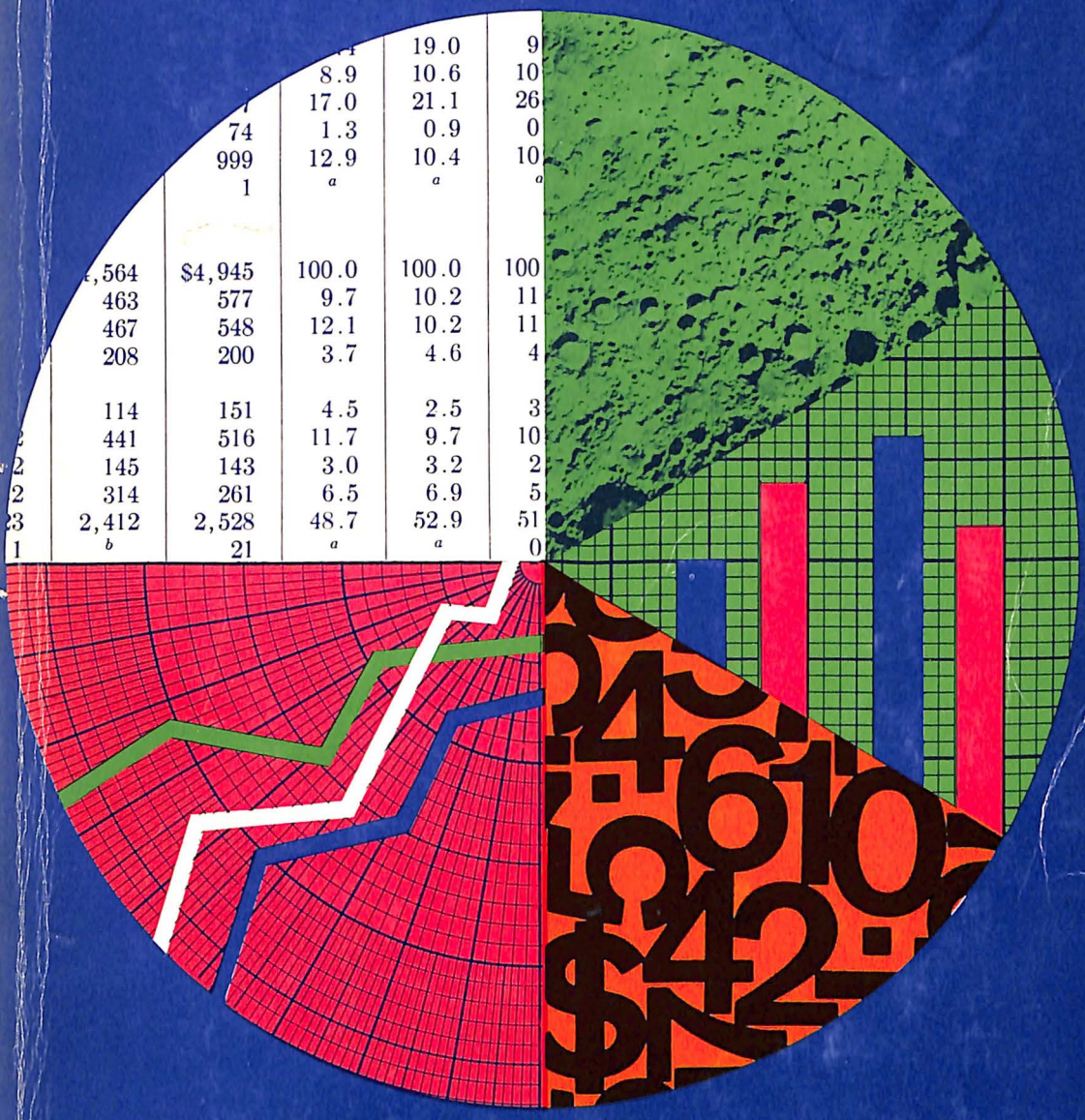
AEROSPACE FACTS AND FIGURES



		19.0		9
		8.9		10
		17.0		26
	74	1.3		0
	999	12.9		10
	1	*a*	*a*	*a*
,564	$4,945	100.0	100.0	100
463	577	9.7	10.2	11
467	548	12.1	10.2	11
208	200	3.7	4.6	4
114	151	4.5	2.5	3
441	516	11.7	9.7	10
145	143	3.0	3.2	2
314	261	6.5	6.9	5
2,412	2,528	48.7	52.9	51
b	21	*a*	*a*	0

1970

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

1970 AEROSPACE FACTS AND FIGURES

COMPILED BY THE OFFICE OF PUBLIC AFFAIRS

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AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

FOREWORD

The landing of men on the moon and their return to earth was by far the major aerospace event during 1969, both from an historical and technological perspective. This evidence of man's ability to travel to another celestial body, accomplish useful tasks and then return to his home planet is the culmination of the most intensive, sustained technological effort in which man has ever been engaged.

While the industry was attaining new technological peaks, it was showing declines in several key economic areas:

- Sales dropped 10.8 percent from a record $29.8 billion in 1968 to $26.9 billion in 1969.
- Average employment in 1969 was 1,354,000 workers compared with 1,418,000 in 1968. Employment contiued to decline during the early months of 1970.
- Net profit after taxes as a percentage of sales dropped to 3.0 percent in 1969 from 3.2 percent in 1968, according to reports from the Securities & Exchange Commission and the Federal Trade Commission. This com-

pares with a profit percentage of 4.8 for all manufacturing corporations.

- Industry backlog was approximately $28.3 billion at year's end, divided almost equally between U. S. government and other orders. Backlog at the end of 1968 was $30.7 billion.
- Aerospace exports, a major contributor to the nation's balance of trade, increased in 1969 to nearly $3.2 billion from about $3 billion in 1968. Civil aerospace exports accounted for nearly $2 billion of the total.

Details on these economic measurements and other areas of aerospace activity are contained in this eighteenth annual edition of *Aerospace Facts and Figures.* The book provides a standard reference work on the industry for the use of managers and administrators in government and industry, editors and writers, industry analysts, educators and students.

KARL G. HARR, JR.
President
Aerospace Industries Association

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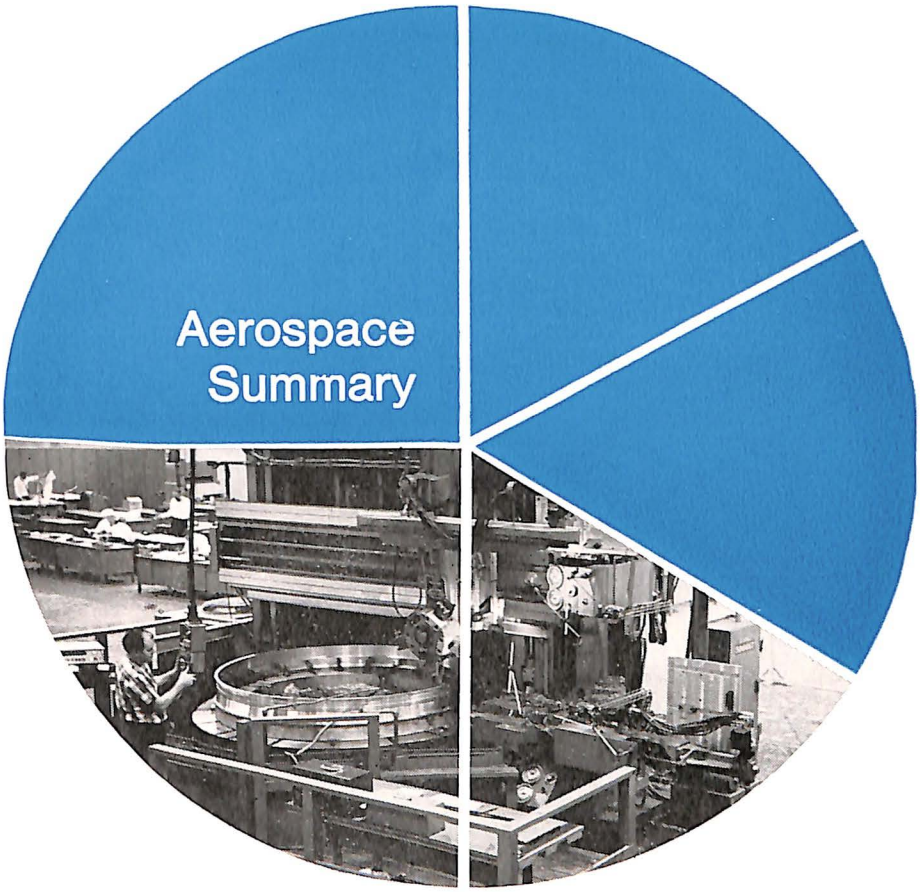


Aerospace industry sales in 1969 declined to about $26.9 billion, a 10.8 percent drop from the record sales of $29.8 billion reported in 1968.

By major group, aerospace sales in 1969 were: aircraft, $14.8 billion; missiles, $5 billion; space vehicles, $4.3 billion; and non-aerospace, $2.7 billion. (The method of computing total sales is described in a footnote to the table, Aerospace Sales and the National Economy, on page 6).

Aerospace sales accounted for 2.9 percent of the total Gross National Product of $932.1 billion.

Net profit as a percentage of sales declined in 1969 to 3.0 percent from 3.2 percent in 1968, according to reports from the Securities & Exchange Commission and the Federal Trade Commission.

This profit percentage compares with 4.8 for all manufacturing corpo-

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		
		Manufacturing Industries	Durable Goods Industry	Aerospace Industry	GNP	Manufacturing Industries	Durable 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	793.5r	548.5	299.7	27.3	3.4	5.0	9.1
1968	865.7r	603.7	331.0	29.8r	3.4	4.9	9.0
1969	932.1	655.6	363.7	26.9	2.9	4.1	7.4

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 60 areospace companies (adjusted to eliminate duplication by subcontracting) and 6. Non-aerospace sales reported by the approximately 60 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.

rations, 5 percent for non-durable goods and 4.6 percent for durable goods.

Backlog of the industry declined at almost the same ratio as sales. At the end of 1969, the backlog was about $28.3 billion compared with approximately $30.7 billion at the close of 1968. The backlog was divided almost equally between government and other business. U.S. government orders amounted to $14.3 billion and other customers accounted for the balance of about $14 billion.

For the fifth consecutive year aerospace exports increased, accounting for 8.4 percent of total U.S. exports of merchandise. Aerospace exports reached nearly $3.2 billion with civil aerospace products amounting to nearly $2 billion of the total.

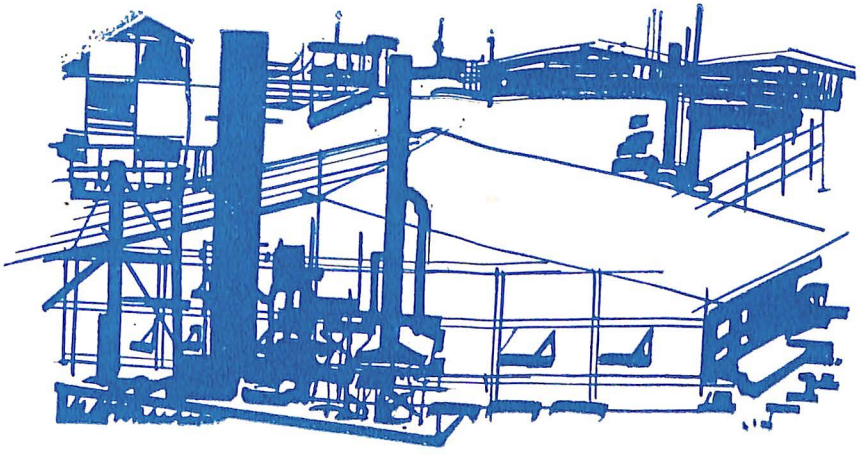
Average aerospace employment in 1969 declined to 1,354,000 work-

ers from the average of 1,418,000 in 1968. However, the total aerospace payroll increased to approximately $14.2 billion with salaried workers accounting for about $8.2 billion and production workers for $6 billion.

AEROSPACE CONTRIBUTION TO GROSS NATIONAL PRODUCT
Calendar Years 1960 to Date
(Dollar Figures in Billions)

Year	Total Gross National Product	Contribution to GNP by		Aerospace Contribution as Percent of	
		Manufacturing Industries	Aerospace Industry	GNP	Manufacturing Industries
1960	$503.7	$144.4	$ 8.5[r]	1.7	5.9
1961	520.1	144.2	8.8[r]	1.7	6.1
1962	560.3	158.8	10.0[r]	1.8	6.3
1963	590.5	167.0	10.6[r]	1.8	6.3
1964	632.4	180.3	10.7	1.7	5.9
1965	684.9	198.5[r]	11.2[r]	1.6	5.6
1966	749.9[r]	218.0[r]	13.5	1.8	6.2
1967	793.5[r]	224.0[r]	15.5[r]	1.9	6.9
1968	865.7[r]	246.4[r]	17.2[r]	2.0[r]	7.0[r]
1969[E]	932.1	265.9	15.7	1.7	5.9

[r] Revised.
NOTE: The contribution of an industry to Gross National Product is composed of the value added by manufacturing with adjustments for taxes and services.
Source: U. S. Department of Commerce, "Survey of Current Business" (Monthly). Aerospace Industries Association estimates, based on latest available information.



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]	29,805	17,424	4,719	5,113	2,549
1969	26,882	14,816	5,053	4,308	2,705

[r] Revised
NOTE: For explanation of "Aerospace Sales" see "Note" on page 6.
Source: Aerospace Industries Association estimates, based on latest available information.

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]	29,805	16,573	3,920	6,763	2,549
1969	26,882	15,799	3,314	5,064	2,705

[r] Revised
NOTE: For explanation of "Aerospace Sales" see "Note" on page 6.
Source: Aerospace Industries Association estimates, based on latest available information.

DEPARTMENT OF DEFENSE
TOTAL EXPENDITURES BY APPROPRIATION GROUP
Fiscal Years, 1962 to Date
(Millions of Dollars)

	Year Ending June 30	
	1963	1964[r]
TOTAL	$49,973	$50,786
PROCUREMENT	16,632	15,351
AIRCRAFT	6,309	6,053
MISSILES	3,817	3,577
Ships	2,522	2,078
Ordnance, Vehicles, & Related Equipment	1,665	1,597
Electronics and Communications	1,427	1,264
Other procurement	892	782
RESEARCH, DEVELOPMENT, TEST AND EVALUATION	6,376	7,021
AIRCRAFT	544	939
MISSILES	2,241	2,352
ASTRONAUTICS	946	1,284
Other	2,645	2,446
MILITARY ASSISTANCE	1,721	1,485
AIRCRAFT AND MISSILES	445	218
Other	1,276	1,276
Military Construction	1,144	1,026
Family Housing	427	580
Civil Defense	203	107
Military Personnel	13,000	14,195
Active Forces	11,386	12,312
Reserve Forces	599	674
Retired Pay	1,015	1,211
Operations and Maintenance	11,874	11,695
Other	(1,404)	(452)

DEPARTMENT OF DEFENSE
TOTAL EXPENDITURES BY APPROPRIATION GROUP—*Continued*
Fiscal Years, 1962 to Date
(Millions of Dollars)

Year Ending June 30						
1965[r]	1966[r]	1967[r]	1968[r]	1969[r]	1970[rE]	1971[E]
$47,098	$55,181	$68,315	$78,027	$78,666	$77,000	$71,791
11,839	14,339	19,102	23,283	23,988	21,550	18,799
5,200	6,635	8,411	9,462	9,177	7,646	6,609
2,096	2,069	1,930	2,219	2,509	2,919	3,203
1,713	1,479	1,398	1,356	1,949	1,900	1,630
1,041	1,642	3,881	5,860	6,590	5,603	4,389
897	983	1,284	1,595	1,409	1,188	986
893	1,531	2,108	2,791	2,354	2,294	1,682
6,236	6,259	7,160	7,747	7,459	7,300	7,382
1,017	976	1,048	1,335	1,031	1,530	1,488
1,901	1,801	2,502	2,522	2,410	2,159	2,300
921	930	983	1,220	1,159	739	663
2,397	2,552	2,627	2,670	2,859	2,872	2,931
1,229	968	873	601	686	556	664
358	299	182[a]	97[a]	57[a]	61[a]	60[a]
871	1,024	691	504	629	495	604
1,007	1,334	1,536	1,281	1,389	1,124	1,154
619	647	482	495	572	630	623
93	86	100	108	87	75	70
14,771	16,753	19,787	22,044	23,828	24,362	24,227
12,662	14,407	17,055	19,090	20,478	21,503	21,933
725	755	902	871	907	988	
1,384	1,591	1,830	2,093	2,443	2,859	3,194
12,349	14,710	19,000	20,951	22,285	21,422	19,512
(741)	281	510	1,980	(2,021)	(903)	(640)

[E] Estimate.
[r] Revised.
[a] 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, "Press Package", January 13, 1969, and for earlier years, "Military Assistance Facts", "The Budget of the United States Government", (Annually).

BACKLOG OF MAJOR AEROSPACE COMPANIES,
BY PRODUCT GROUP
1960 to Date
(Millions of Dollars)

As of December 31	GRAND TOTAL	TOTAL		Aircraft and Engines		Missiles & Space Incl. Propulsion	Other Aerospace		Non aerospace
		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

NOTE: Based on reports from about 60 aerospace companies.
[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.
N.A.—Not available.
Source: Bureau of the Census, "Current Industrial Reports," Series M37D. (Quarterly).

SALES OF MAJOR AEROSPACE COMPANIES,
BY PRODUCT GROUP
1960 to Date
(Millions of Dollars)

Year ending December 31	GRAND TOTAL	TOTAL		Aircraft and Engines		Missiles & Space Incl. Propulsion	Other Aerospace		Non-aerospace
		U.S. Govt.	Other	U.S. Govt.	Other		U.S. Govt.	Other	
1960	10,977	N.A.	N.A.	4,246	2,183	N.A.	N.A.	N.A.	4,568
1961	14,948	11,766	3,182	3,967	1,888	5,187	1,824	852	1,230
1962	15,972	12,552	3,420	4,128	1,772	6,078	1,791	762	1,441
1963	16,407	13,203	3,204	4,158	1,459	6,904	1,611	682	1,593
1964	16,686	12,815	3,871	4,568	1,863	6,381	1,418	735	1,721
1965	17,016	12,515	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[r]	23,444	16,334	7,110	7,141	4,753	6,054	1,914	1,002	2,580
1968[r]	25,592	16,635	8,957	7,411	6,439	6,076	2,077	1,040	2,549
1969	24,793	16,703	8,090	7,299	5,610	5,650	2,548	981	2,705

[r] Revised
NOTE: Based on reports from about 60 aerospace companies.
N.A.—Not available.
Source: Bureau of the Census, "Current Industrial Reports," Series M37D. (Quarterly).

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

Year Ending June 30	Federal Expenditures (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	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	77,381	4,724	21,353	27.6
1969	77,879	4,251	20,472	26.3
1970[E]	76,504	3,889	18,812	24.6
1971[E]	71,190	3,403	17,594	24.7

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.
[E] Estimate
Source: "The Budget of the United States Government" (Annually).

Department of Defense
Aerospace Expenditures
Fiscal Years 1960 to Date
(Millions of Dollars)

Year Ending June 30	DOD Aerospace Expenditures	Procurement		Research, Development, Test, and Evaluation
		Military Functions	Military Assistance[a]	
1960	$13,013	$ 9,299	$511	$3,203
1961	13,379	8,870	419	4,090
1962	14,359	9,842	367	4,150
1963	14,302	10,126	445	3,731
1964	14,423	9,630	218	4,575
1965	11,487	7,290	358	3,839
1966	12,710	8,704	299	3,707
1967	15,056	10,341	182	4,533
1968	16,855	11,681	97	5,077
1969	16,333	11,686	57	4,600
1970[E]	15,054	10,565	61	4,428
1971[E]	14,323	9,812	60	4,451

[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, Reports "FAD 647 and 648", February 3, 1970, and earlier reports; Department of Defense, "Military Assistance Facts" (Annually); "The Budget of the United States Government" (Annually).

Department of Defense
New Obligational Authority
Fiscal Years 1962 to Date
(Millions of Dollars)

Year Ending June 30	Total	Aircraft	Missiles	Astronautics
1962	$13,077	$ 6,591	$5,604	$ 882
1963	14,112	6,499	6,415	1,198
1964	14,013	6,649	6,107	1,257
1965	12,464	7,025	4,550	889
1966	15,083	10,463	3,541	1,079
1967	16,329	10,737	4,650	942
1968	16,581	10,641	4,897	1,043
1969[a]	14,528	7,593	5 [illegible]63	1,072
1970[a E]	13,290	7,267	[illegible]53	670
1971[E]	14,017	7,697	5,839	481

[E] Estimate.
[a] Excludes transfers from stock funds.
Source: Department of Defense, Reports "FAD 647, 648, February 2, 1970, and earlier reports.

Active Military Forces of the United States
1961 and 1968 to Date

Description	Actual		Estimated	
	June 30, 1961	June 30, 1968	June 30, 1969	June 30, 1970
Military personnel (in thousands):				
Army	859	1,570	1,534	1,508
Navy	627	765	771	772
Marine Corps	177	307	313	315
Air Force	821	905	869	861
Total, Department of Defense	2,484	3,547	3,487	3,456
Selected military forces:				
Strategic forces:				
Intercontinental ballistic missile squadrons:				
Minuteman	—	20	20	20
Titan	—	6	6	6
Atlas	5	—	—	—
Polaris submarines/missiles (in commission)	5/80	41/656	41/656	41/656
Strategic bomber squadrons:				
FB-111	—	—	—	5
B-52	39	34	30	24
B-58	6	6	6	6
B-47	80	—	—	—
Manned fighter interceptor squadrons	42	24	19	19
Bomarc interceptor missile squadrons	7	6	6	6
Army air defense missile battalions	49½	20¼	15	14½
General purpose forces:				
Army divisions	11	18	18	18
Army maneuver battalions	124	218	217	218
Army aviation units	67	212	235	235
Army special forces groups	3	7	7	7
Warships (in commission):				
Attack carriers	15	15	15	15
Antisubmarine warfare carriers	9	8	7	6
Nuclear attack submarines	13	33	41	47
Other	328	328	299	279
Amphibious assault ships (in commission)	110	157	157	141
Carrier air wings/groups (attack and ASW)	28	23	21	20
Marine Corps divisions/aircraft wings	3/3	4/3	4/3	4/3
Air Force tactical forces squadrons	93	144	147	138
Airlift and sealift forces:				
Airlift aircraft squadrons:				
C-5A	—	—	—	2
C-130 through C-141	16	44	44	41
C-118/C-124 and C-7	35	17	12	7
Troopships, cargo ships, and tankers	101	130	124	124
Active aircraft inventory (all programs):				
Army	5,564	10,465	11,622	12,018
Navy	8,793	8,491	8,594	8,452
Air Force[a]	16,905	15,327	15,058	14,993
Helicopters included in service aircraft, above	4,047	10,188	11,468	12,014
Commissioned ships in fleet (all programs)	819	932	906	895

[a] Includes aircraft provided for support of allies.
Source: "The Budget of the United States Government", (Annually).

EMPLOYMENT IN ALL MANUFACTURING, DURABLE GOODS, AND AEROSPACE INDUSTRIES
Calendar Years 1959 to Date
(Thousands of Employees)

Annual Average	All Manufacturing Industries	Durable Goods Industries	Aerospace Industry		
			Total	As Percent of	
				Manufacturing	Durable Goods
1959	16,675	9,373	1,128	6.8%	12.0%
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	20,121	11,880	1,354	6.7	11.4

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

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

Year Ending December 31	Annual Average Aerospace Employment			Aerospace Payroll			Aerospace as Percent of Total	
	TOTAL	Salaried	Production Worker	TOTAL	Salaried	Production Worker	Manufacturing Employment	Manufacturing Payroll
	(Thousands of Employees)			(Millions of Dollars)				
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

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.

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			Percent of Total U. S. Exports
		Total			
1912	$ 2,170.3	$ 0.1			[a]
1915–18	22,176.7	31.5			0.14
1922	3,765.1	0.5			[a]
1929	5,157.1	9.1			0.18
1931	2,378.0	4.9			0.2
1939	3,123.3	117.8			3.8
1944	14,161.5	2,818.2			19.9
			Commercial Transports	Other Aerospace Products	
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
			Military	Civil	
1958	$17,745	$1,398	$ 713	$ 685	7.9
1959	17,461	1,095	557	538	6.3
1960	20,383	1,726	637	1,089	8.5
1961	20,754	1,653	775	878	8.0
1962	20,431	1,923	1,013	910	9.4
1963	23,C62	1,627	895	732	7.1
1964	26,156	1,608	844	764	6.1
1965	27,135	1,618	764	854	6.0
1966	29,884	1,673	638	1,035	5.6
1967	31,142	2,248	868	1,380	7.2
1968[r]	34,199	2,994	705	2,229	8.8
1969	37,444	3,151	1,203	1,948	8.4

[r] Revised.
[a] Less than 0.005 percent.
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).

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

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

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

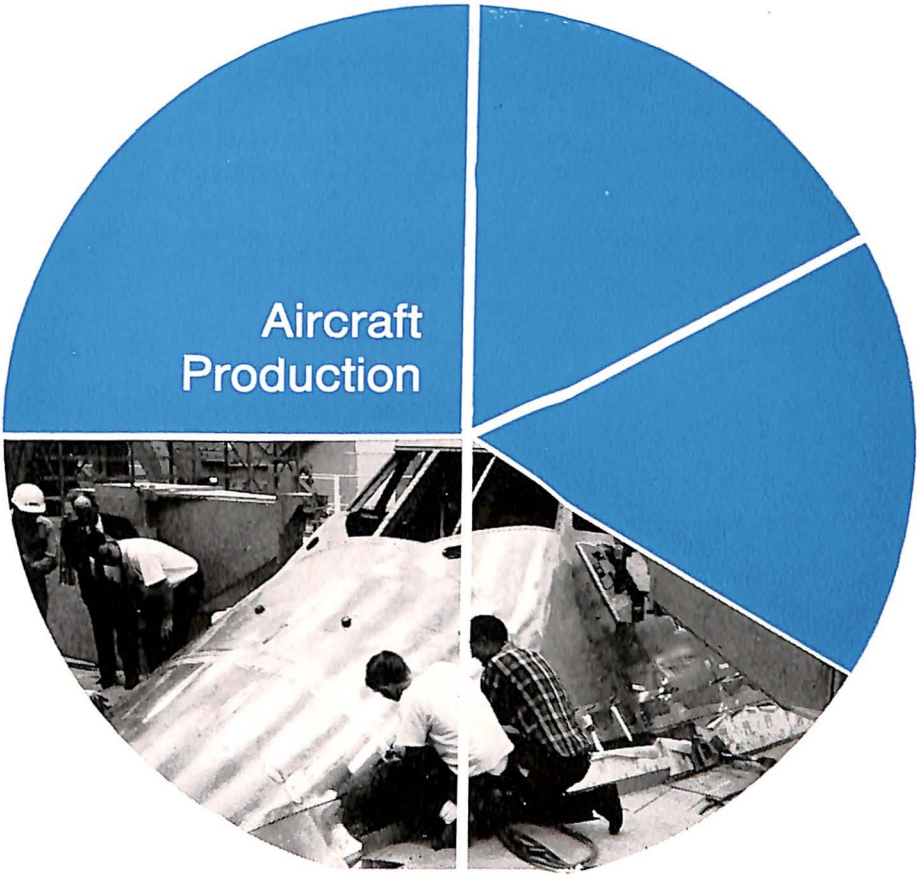
Year	All Manufacturing Corporations (except Newspapers)	Non-Durable Goods	Durable Goods	Aerospace
1957	4.8%	4.9%	4.8%	2.9%
1958	4.2	4.4	3.9	2.4
1959	4.8	4.9	4.8	1.6
1960	4.4	4.8	4.0	1.4
1961	4.3	4.7	3.9	1.8
1962	4.5	4.7	4.4	2.4
1963	4.7	4.9	4.5	2.3
1964	5.2	5.4	5.1	2.6
1965	5.6	5.5	5.7	3.2
1966	5.6	5.5	5.6	3.0
1967	5.0	5.3	4.9	2.7
1968	5.1	5.3	4.9	3.2
1969	4.8	5.0	4.6	3.0

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

New Obligational Authority for Aerospace Products and Services
Fiscal Years 1962 to Date
(Millions of Dollars)

Year Ending June 30	Total	Department of Defense	National Aeronautics and Space Administration
1962	$14,874	$13,077	$1,797
1963	17,738	14,112	3,626
1964	19,059	14,013	5,046
1965	17,632	12,464	5,168
1966	20,178	15,083	5,095
1967	21,191	16,329	4,862
1968	21,034	16,581	4,453
1969	18,350	14,528[a]	3,822
1970[E]	16,839	13,290[a]	3,549
1971[E]	17,162	14,017	3,145

[E] Estimate.
[a] Excludes transfers from stock funds.
Sources: Department of Defense, Reports "FAD 647, 648", February 2, 1970 and earlier reports. National Aeronautics and Space Administration, "Aeronautics and Space Report" of the President to the Congress, 1970.



Aircraft production by the aerospace industry in 1969 dropped nearly 12 percent below that of the previous year.

Production of commercial air transports was down to 514, a 27 percent drop from the 702 completed units that rolled off the assembly lines in 1968. General aviation production also dropped to 12,456 units, a 9 percent decrease from the 13,698 aircraft completed in 1968. Production of commercial helicopters however continued to increase slightly from 522 completions in 1968 to 534 in 1969.

Combined aircraft sales also registered a decline in 1969, down to $12.9 from $13.9 billion reported in the previous year. A $800 million drop in commercial aircraft sales accounted for most of the 7 percent over-

all decrease. Sales of military aircraft recorded a lesser decrease of $100 million.

Concurrently, the backlog of total aircraft orders for 1969 reflected a decline of $1.4 billion from the $20.5 billion recorded in 1968. A $1.1 billion reduction in military orders accounted for most of the decline, with civil aircraft orders moving downward some $300 million.

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

Year Ending December 31	Aircraft, Aircraft Engines, Propellers, and Parts	
	Net Sales During Year	Backlog December 31
1948	$ 1,061[a]	$ 2,983
1949	1,668	2,853
1950	2,116	4,717
1951	2,872	11,898
1952	5,654	16,692
1953	7,754	15,928
1954	7,471	13,755
1955	7,231	13,864
1956	7,689	16,000
1957	9,482	12,363
1958	8,661	10,182
1959	7,206	8,082
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[r]	20,628
1968	13,850[r]	20,559[r]
1969	12,909	19,188

[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 60 aerospace companies.
Source: Bureau of the Census, "Current Industrial Reports," Series [illegible]7D (Quarterly).

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

Year Ending Dec. 31	Total			Aircraft & Parts		Aircraft Engines & Parts		Aircraft Propellers & Parts	
	TOTAL	U.S. Government	Other	U.S. Government	Other	U.S. Government	Other	U.S. Government	Other
1948[a]	$1,061	$ 884	$ 177	$ 626	$ 122	$ 222	$ 43	$ 36	$12
1949	1,668	1,438	230	927	171	461	47	50	12
1950	2,116	1,878	238	1,255	161	561	64	62	13
1951	2,872	2,525	347	1,657	226	779	100	89	21
1952	5,654	5,004	650	3,442	455	1,440	169	122	26
1953	7,754	7,026	734	5,661	518	2,189	189	176	27
1954	7,471	6,649	822	4,626	600	1,872	190	151	32
1955	7,231	6,445	786	4,605	559	1,728	205	112	22
1956	7,689	6,523	1,166	4,704	814	1,718	317	101	35
1957	9,482	7,884	1,598	5,607	1,165	2,137	390	140	43
1958	8,661	7,289	1,372	5,305	1,014	1,858	321	126	37
1959	7,206	5,395	1,841	4,063	1,395	1,268	408	64	38
1960	6,527	4,319	2,208	3,333	1,766	913	417	73	25
1961	5,842	3,966	1,876	2,945	1,442	1,021	434	[b]	[b]
1962	5,898	4,126	1,772	2,998	1,389	1,130	383	[b]	[b]
1963	5,613	4,154	1,459	2,986	1,055	1,168	404	[b]	[b]
1964	6,428	4,571	1,857	3,506	1,409	1,065	448	[b]	[b]
1965	7,057	4,525	2,532	3,393	1,950	1,132	582	[b]	[b]
1966	8,725	5,458	3,267	4,086	2,544	1,372	723	[b]	[b]
1967[r]	11,894	7,141	4,753	5,345	3,737	1,796	1,016	[b]	[b]
1968[r]	13,850	7,411	6,439	5,697	5,188	1,714	1,251	[b]	[b]
1969	12,909	7,299	5,610	5,382	4,517	1,917	1,093	[b]	[b]

[a] Total for the last three quarters of 1948 only.
[b] Included in "Aircraft and Parts."
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 60 aerospace companies.
Source: Bureau of the Census, "Current Industrial Reports. Series M37D" (Quarterly).

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[E]	7,646	4,500	2,398	748
1971[E]	6,609	3,935	2,165	509

N.A.—Not available.
[E] Estimate.
Source: Department of Defense, Report "FAD 647", February 3, 1970, and earlier reports.

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

Dec. 31	Total			Aircraft & Parts		Aircraft Engines & Parts		Aircraft Propellers & Parts	
	TOTAL	U.S. Government	Other	U.S. Government	Other	U.S. Government	Other	U.S. Government	Other
1948	$ 2,983	$2,817	$ 166	$1,962	$ 132	$ 759	$ 27	$ 96	$ 7
1949	2,853	2,708	145	1,913	100	710	39	85	6
1950	4,717	4,287	430	2,759	343	1,399	71	129	16
1951	11,898	10,899	999	7,336	790	3,350	181	213	28
1952	16,692	15,626	1,066	10,367	855	4,992	180	267	31
1953	15,928	14,984	944	10,840	764	3,953	153	191	27
1954	13,755	12,835	920	9,868	771	2,806	123	161	26
1955	13,864	11,553	2,311	8,717	1,956	2,730	331	106	24
1956	16,000	12,299	3,701	8,837	2,907	3,316	749	146	45
1957	12,363	8,942	3,421	6,437	2,799	2,379	590	126	32
1958	10,182	6,933	3,249	5,407	2,688	1,479	539	47	22
1959	8,082	5,442	2,640	4,419	2,231	985	400	48	9
1960	7,736	5,357	2,379	4,101	2,031	1,256	348	[a]	[a]
1961	7,192	5,056	2,136	3,968	1,678	1,088	458	[a]	[a]
1962	6,572	4,900	1,672	3,736	1,309	1,164	363	[a]	[a]
1963	6,811	4,924	1,887	3,844	1,457	1,080	430	[a]	[a]
1964	7,797	5,282	2,515	4,290	1,987	992	528	[a]	[a]
1965	11,388	6,107	5,271	4,460	4,425	1,647	856	[a]	[a]
1966	18,479	8,761	9,718	6,515	8,140	2,246	1,578	[a]	[a]
1967	20,628	20,628		7,071	9,306	4,251		[a]	[a]
1968	20,559	8,150	12,409	5,999	10,609	2,151	1,800	[a]	[a]
1969	19,188	7,090	12,098	5,270	10,340	1,820	1,758	[a]	[a]

NOTE: 1948 to 1960 based in 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 60 aerospace companies.
[a] Included in "Aircraft and Parts."
Source: Bureau of the Census, "Current Industrial Reports, Series M37D" (Quarterly).

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 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	19,476[E]	4,500[E]	14,976
1969	17,197[E]	4,000[E]	13,197

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.

MILITARY AIRCRAFT PRODUCED: NUMBER, FLYAWAY VALUE, AND AIRFRAME WEIGHT
Calendar Years 1950 to Date

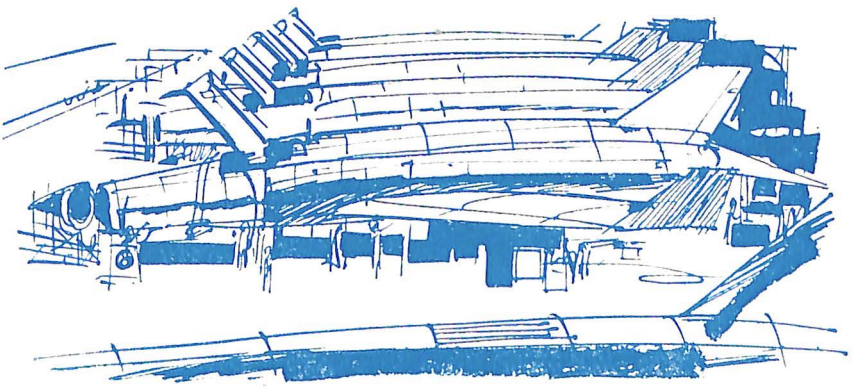
Year Ending December 31	TYPE OF AIRCRAFT						
	TOTAL	Bomber	Fighter	Transport	Trainer	Helicopter	Other
NUMBER							
1950	2,680	560	1,477	176	351	60	56
1951	5,055	502	1,937	271	558	349	1,438
1952	7,131	1,193	2,117	479	1,363	961	1,018
1953	8,978	1,156	3,958	713	1,510	873	768
1954	8,089	1,806	3,511	626	1,403	373	370
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
FLYAWAY VALUE[a] *(Millions of Dollars)*							
1950	1,141.3	546.4	339.7	178.5	47.7	6.3	22.7
1951	1,684.3	690.5	559.1	278.5	78.2	29.6	48.4
1952	3,162.0	1,334.7	751.7	647.9	256.1	101.4	70.2
1953	4,722.9	1,799.2	1,672.5	791.5	253.6	124.4	81.7
1954	5,715.0	2,405.4	2,087.0	854.4	261.3	82.0	24.9
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	285.2	199.7	228.2	54.7
1962	3,816.1	1,629.5	1,005.2	74.3	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

(Continued on next page)

MILITARY AIRCRAFT PRODUCED: NUMBER, FLYAWAY VALUE, AND AIRFRAME WEIGHT—*Continued*
Calendar Years 1950 to Date

Year Ending December 31	TYPE OF AIRCRAFT						
	TOTAL	Bomber	Fighter	Transport	Trainer	Helicopter	Other
AIRFRAME WEIGHT[c] (*Millions of Pounds*)							
1950	35.9	16.4	10.2	6.7	1.9	[b]	0.7
1951	50.2	17.0	15.7	11.5	3.1	[b]	2.0
1952	107.3	36.7	31.7	24.6	9.5	[b]	4.8
1953	138.0	44.1	40.7	36.5	11.3	[b]	5.4
1954	130.4	51.8	35.4	31.1	9.6	[b]	2.5
1955	114.3	39.9	43.2	20.9	7.4	[b]	2.9
1956	90.0	38.6	30.6	13.1	3.3	[b]	4.4
1957	79.4	32.7	28.7	9.3	4.2	[b]	4.5
1958	66.1	25.2	18.0	15.9	3.1	[b]	3.9
1959	51.8	18.6	12.9	14.6	3.5	[b]	2.2
1960	35.8	13.6	9.1	9.7	1.1	[b]	2.3
1961	29.6	11.9	6.1	8.3	0.9	[b]	2.4
1962	35.6	10.3	7.4	13.2	1.3	[b]	3.4
1963	32.1	4.1	8.2	14.5	1.3	[b]	4.0
1964	38.7	5.6	12.4	15.1	1.1	[b]	4.5
1965	33.9	4.7	10.7	10.8	1.4	[b]	6.3
1966	44.1	4.4	12.6	14.0	1.8	[b]	11.3
1967	41.3	4.2	11.7	13.0	1.9	[b]	10.5

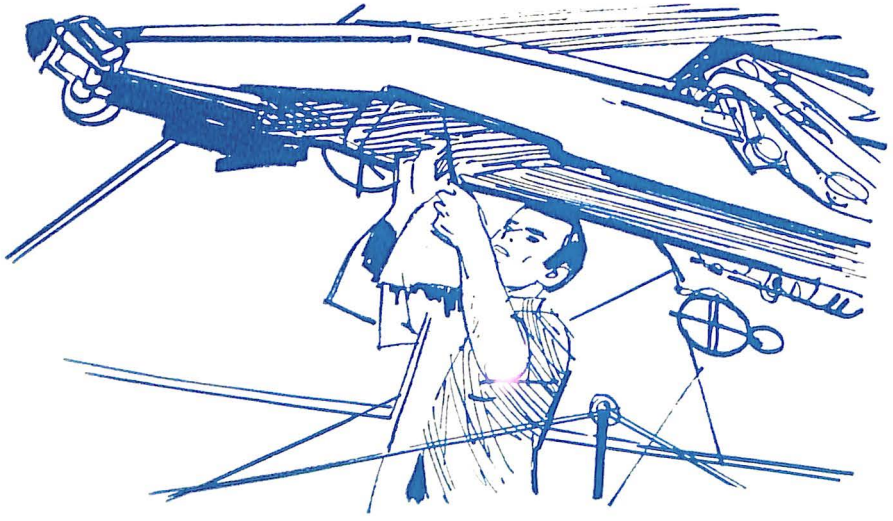
NOTE: Data exclude gliders and targets.
[a] Values up to 1961, are based on unit prices in latest production contracts and do not include values of spares, spare parts, and other support equipment. Since 1961, data include spares, spare parts, and support equipment that are procured with the basic aircraft.
[b] Airframe weight of helicopters is included in the "other" category.
[c] Airframe weight includes aircraft produced for Military Assistance and other federal agencies.
Source: Department of Defense. Data released with a two year lag for security reasons.



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

Major Item	Year Ending June 30	
	1970	1971
AIRCRAFT—Total	1,935	1,465
Air Force	586	390
Navy and Marine Corps	348	261
Army	1,001	841
Helicopters	1,259	1,009
Fixed Wing Aircraft	676	459
MISSILES—Total	39,093	24,431
Air Force	1,600	942
Navy and Marine Corps	3,111	3,791
Army	34,382	19,698
SHIPS—Navy—Total	19	29
New Construction	10	14
Conversions	9	15
TRACKED COMBAT VEHICLES—TOTAL	2,290	2,238
Army	2,154	1,939
Marine Corps	136	299

Source: Department of Defense, OASD, Comptroller (Press Package) February 2, 1970.



PRODUCTION OF COMMERCIAL[a] TRANSPORT AIRCRAFT
1962 to Date
(Fixed Wing, Multiple Engine)

Company and Aircraft	1962	1963	1964	1965	1966	1967	1968	1969
TOTAL	134	100	163	233	344	480	702	514
Boeing								
707	38	28	32	54	77	113	111	59
720	30	6	6	9	6	5	—	—
727	—	6	95	112	135	115	160	115
737	—	—	—	—	—	4	105	114
747	—	—	—	—	—	—	—	4
Convair								
880	9	14	—	—	—	—	—	—
990	22	15	—	—	—	—	—	—
Fairchild								
F-27	7	6	5	12	3	3	—	2
FH-227	—	—	—	—	27	35	6	—
Lockheed								
130	6	6	—	10	11	9	25	13
McDonnell-Douglas								
DC-8	22	19	20	31	16	41	102	85
DC-9	—	—	—	5	69	155	193	122
Other	—	—	5	—	—	—	—	—

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

TOTAL ORDERS FOR JET AIRCRAFT
(Domestic and Foreign)
Airline and Executive-Type Fixed Wing
As of December 31, 1969

	TOTAL Aircraft for Delivery in 1970 or Later	Domestic Orders	Foreign Orders
TOTAL			
Number of aircraft	1,234	864	370
Value-million dollars	$8,582	$5,814	$2,768
TRANSPORTS			
Number of aircraft	608	368	240
Value-million dollars[a]	$8,155	$5,450	$2,705
EXECUTIVE TYPE			
Number of aircraft[b]	626	496	130
Value-million dollars	$ 427	$ 364	$ 63
NUMBER OF TRANSPORT AIRCRAFT			
Boeing			
B-707	11	2	9
B-727	47	35	12
B-737	37	8	29
B-747	182	115	67
Lockheed			
L-1011	181	131	50
McDonnell Douglas			
DC-8	37	9	28
DC-9	54	9	45
DC-10	59	59	—

[a] Dollar values exclude the cost of spare parts.
[b] Backlog of executive jet aircraft are not totally comparable to those reported for transports, as executive aircraft are purchased largely off the shelf.
Source: Aerospace Industries Association, company reports.

Shipments of General Aviation Aircraft by Selected Manufacturers

Calendar Years 1947 to Date

Year Ending December 31	Total	Beech	Cessna	Champion	Lear	Lockheed	Mooney [a]	North American Rockwell [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	12,456	1,061	5,887	293	61	14	376	344	3,951	469
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	36.9	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

N.A. -Not available.
[a] Includes production of Imco.
[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: Aerospace Industries Association, company reports.

PRODUCTION OF MILITARY HELICOPTERS
Calendar Years 1941 to Date

Year Ending December 31	TOTAL	Air Force	Navy	Army
1941	7	7	—	—
1942	—	—	—	—
1943	22	19	3	—
1944	144	120	24	—
1945	275	241	34	—
1946	44	40	4	—
1947	57	36	21	—
1948	153	94	59	—
1949	73	24	43	6
1950	60	6	39	15
1951	360	14	143	192
1952	983	49	353	559
1953	943	165	245	463
1954	431	172	46	155
1955	444	82	128	200
1956	647	62	152	430
1957	689	16	193	450
1958	668	2	204	435
1959	451	28	101	322
1960	494	57	147	284
1961	366	42	187	137
1962	624	33	208	313
1963	762	45	165	462
1964	1,099	34	145	828
1965	1,488	60	195	1,215
1966	2,242	80	253	1,831
1967	2,448	73	279	2,096

NOTE: Prior to 1959 the total includes helicopters bought by the Department of Defense under the Military Assistance Program and for other federal agencies.
Source: Department of Defense. Data released with a two-year lag for security reasons. For more recent data see pages 15 and 30.

PRODUCTION OF COMMERCIAL HELICOPTERS
(Number of Helicopters)
Calendar Years 1960 to Date

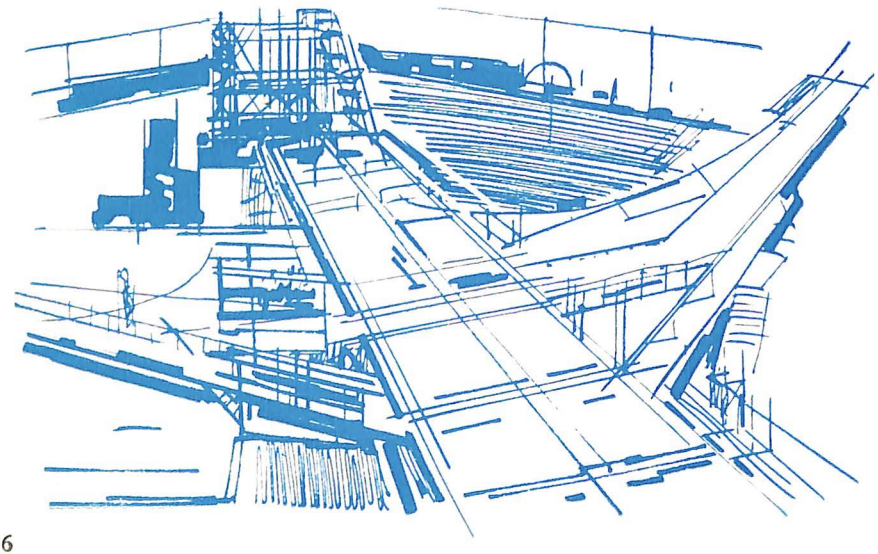
Company and Helicopter	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
TOTAL	266	378	407	504	579	598	583[a]	455[ab]	522[ab]	534[ab]
Bell										
U.S. production										
47 series	87	93	92	101	118	134	183	171	151	134
204 series	—	—	1	13	8	16	20	20	—	—
205 series	—	—	—	—	—	—	—	12	29	49
206 series	—	—	—	—	—	—	—	113	184	156
Foreign licensees										
47 series	57	70	63	81	103	123	147	N.A.	N.A.	N.A.
204 series	—	—	18	32	48	48	46	N.A.	N.A.	N.A.
102 series	1	2	—	—	—	—	—	N.A.	N.A.	N.A.
Boeing-Vertol										
U.S. production										
BV-44/43	12	—	1	—	—	—	—	—	—	—
BV-107	—	—	4	5	16	13	13	—	—	—
Foreign licensees										
BV-107	—	—	—	7	3	1	1	—	—	—
Brantly										
B2 series	33	77	62	36	48	25	14	13	—	—
305	—	—	—	—	—	14	23	4	—	—
Enstrom										
F-28	—	—	—	—	—	—	4	7	—	—
F-28A	—	—	—	—	—	—	—	—	13	25
Fairchild Hiller										
12 series	72	99	54	34	34	73	29	9	4	2
FH-1100	—	—	—	—	—	—	8	44	60	40
Hughes										
200's	—	17	86	163	46	23	—	—	—	—
300's	—	—	—	—	121	81	62	48	57	43
500's	—	—	—	—	—	—	—	—	15	65
Kaman										
HH-43B	—	6	11	11	11	10	1	—	—	—
HH-43F	—	—	—	—	—	—	5	—	—	—
Sikorsky										
U.S. and foreign production										
S-55	1	3	—	—	—	—	—	—	—	—
S-58	2	—	—	1	—	—	—	—	—	—
S-61	—	1	8	13	18	31	18	10	6	13
S-62	2	10	6	6	5	1	9	4	3	7
S-64	—	—	1	1	—	—	—	—	—	—

N.A. Not available.
[a] Excludes 3 Fairchild "Porters" in 1966; 9 in 1967; 5 in 1968; 13 in 1969.
[b] Excludes foreign licensees of Bell.
Source: Aerospace Industries Association, company reports.

Production of Helicopters
Total, Commercial and Military
Calendar Years 1954 to Date

Year Ending December 31	Total	Commercial	Military
1954	562	131	431
1955	590	146	444
1956	915	268	647
1957	1,003	314	689
1958	908	240	668
1959	704	253	451
1960	760	266	494
1961	744	378	366
1962	1,031	407	624
1963	1,266	504	762
1964	1,678	579	1,099
1965	2,086	598	1,488
1966	2,825	583	2,242
1967	2,903	455[a]	2,448
1968	N.A.	522[a]	N.A.
1969	N.A.	534[a]	N.A.

N.A.—Not available. See pages 15 and 25 for military production and inventory.
[a] Excludes foreign licensees of Bell.
Source: 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	
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	29,917[E]	—	9,000[E]	18,182	2,735
1969	26,925[E]	—	8,000[E]	17,078[E]	1,847

NOTE: Jet includes turboprop and turbofan.
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.

CIVIL AIRCRAFT ENGINE PRODUCTION
Calendar Years 1962 to Date
(Number of Engines)

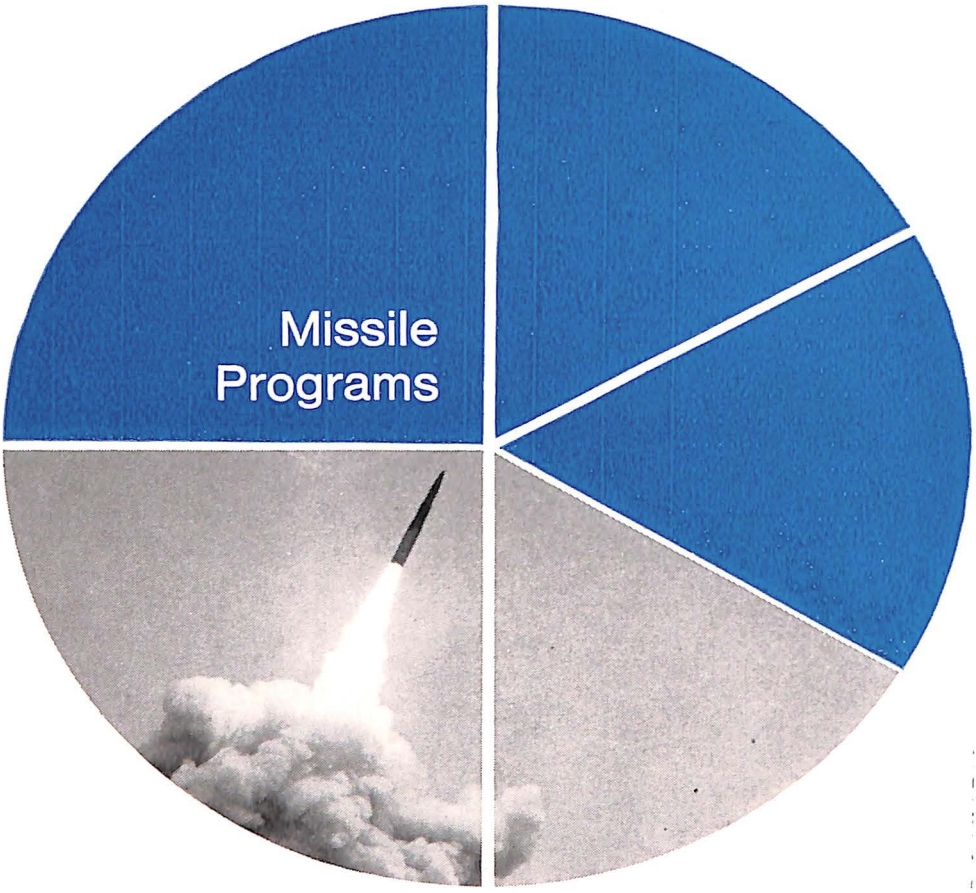
Manufacturer and Engine Designation	1962	1963	1964	1965	1966	1967	1968	1969
TOTAL	10,478	11,795	14,205	18,187	23,262	20,222	20,917	18,925[E]
Reciprocating	9,921	11,322	13,346	17,018	21,324	17,686	18,182	17,078[E]
Jet	557	473	859	1,169	1,938	2,536	2,735	1,847
Continental	5,242	5,409	6,216	9,045	11,132	7,845	7,073	7,208[E]
O-200/C-90	826	773	918	2,059	3,298	2,224	1,912	1,878[E]
O-300	1,104	1,210	1,368	1,678	1,655	620	1	—
IO-346	—	—	92	291	64	58	—	—
IO-360/TSIO-360	—	—	141	680	739	1,101	568	1,190[E]
O-470/IO-470/TSIO-470/GIO-470	3,120	2,630	2,627	2,434	2,508	1,337	1,656	1,530[E]
GTSIO-520/TSIO-520/IO-520	—	665	1,025	1,727	2,851	2,385	2,515	2,610[E]
PE-150	—	—	—	—	—	120	421	—
Other	192	131	45	176	17	—	—	—
General Electric	83	14	25	32	489	260	207	192
CT-58	—	—	25	31	12	28	27	16
CJ-805	25	1	—	1	—	—	—	—
CF-700	—	—	—	—	122	150	130	54
CJ-610	—	—	—	—	—	—	50	122
CJ-610	—	—	—	—	355	82	—	—
Other	58	13	—	—	—	—	—	—
Lycoming	4,621	5,817	7,127	7,973	10,192	9,841	11,109	9,870
O-720/IO-720	—	—	152	43	71	27	17	6
O-541/TIO-541/TGIO-541	—	—	—	—	4	143	210	142
O-540/IO-540/TIO-540	1,194	2,070	2,749	2,969	3,429	2,507	2,885	3,580
O-480/GO-480/IGSO-480/GSO-480	142	169	121	204	221	203	181	151
O-435/GO-435/VO-435/TVO-435	7	206	230	405	506	344	307	164
O-360/IO-360/TIO-360/AIO-360	1,080	1,508	1,729	2,330	2,629	2,733	3,077	1,925
O-320/IO-320	1,248	1,578	2,068	1,942	3,098	3,673	4,055	3,437
O-290	17	13	11	11	9	6	8	9
O-235	289	264	67	62	222	205	369	456
Other	644	9	—	7	3	—	—	—
Pratt & Whitney	474	459	834	1,137	1,449	2,276	2,528	1,655
JT-3D	406	251	337	491	598	874	969	542
JT-12	44	38	87	151	167	157	156	129
JT-8D	3	165	410	435	684	1,244	1,401	821
JT-9D	—	—	—	—	—	—	—	163
Other	21	5	—	—	—	1	2	—

NOTE: Included in the totals are: 1962, 58 by Curtiss Wright; 1963, 96 by Curtiss Wright; 1964, 3 by Curtiss Wright.
[E] All figures are actual, except the last three months for Continental. These were estimated on a straight-line projection of the first nine months.
Source: Aerospace Industries Association, company reports.

MILITARY AIRCRAFT ENGINE ACCEPTANCES
Calendar Years 1958 to Date
(Number of Engines)

ENGINE DESIGNATION	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
TOTAL	8,121	4,626	3,674	5,172	5,441	5,390	5,380	5,191	7,548	8,046
Jet	6,135	3,421	2,025	2,821	3,162	2,871	2,638	2,111	3,142	3,190
J-33	20	—	—	—	—	—	—	—	—	—
J-34	99	139	80	—	—	—	—	—	—	—
J-44	320	55	—	—	—	—	—	—	—	—
J-48	60	24	—	—	—	—	—	—	—	—
J-52	5	36	229	305	471	318	310	202	261	471
J-57	4,000	1,957	565	532	562	476	133	6	—	—
J-60	—	1	29	184	219	207	44	48	100	21
J-69	652	538	487	284	435	321	335	186	479	587
J-75	209	293	256	229	219	174	42	—	—	—
J-79	460	309	174	598	752	894	1,279	1,027	1,416	1,174
J-85	32	69	214	688	486	471	495	642	886	937
J-93	—	—	—	1	—	—	—	—	—	—
J-65	137	—	—	—	—	—	—	—	—	—
J-71	135	—	—	—	—	—	—	—	—	—
J-83	6	—	—	—	—	—	—	—	—	—
JT-3D	—	—	—	—	18	10	—	—	—	—
Turbo-Fan	—	—	168	683	298	76	195	392	631	831
TF-33	—	—	168	683	298	76	182	343	489	468
TF-30	—	—	—	—	—	—	13	49	142	355
TF-39	—	—	—	—	—	—	—	—	—	8
Turbo-Prop	534	544	724	1,251	1,740	2,288	2,372	2,596	3,730	4,025
T-33	—	2	—	—	—	—	—	—	—	—
T-34	103	63	49	—	—	—	—	—	—	—
T-50	—	—	—	43	68	78	131	154	242	159
T-53	40	165	339	358	452	759	981	1,284	1,747	1,924
T-56	371	260	234	522	763	1,019	719	497	566	318
T-58	20	54	96	298	384	348	342	370	626	221
T-YT-55	—	—	—	30	73	68	138	228	394	462
T-64	—	—	—	—	1	16	61	63	155	32
T-63	—	—	—	—	—	—	—	—	—	656
T-73	—	—	—	—	—	—	—	—	—	53
T-74	—	—	—	—	—	—	—	—	—	102
T-76	—	—	—	—	—	—	—	—	—	98
Reciprocating	1,452	661	756	417	241	155	175	92	45	—
O-435	298	327	189	—	—	—	—	—	—	—
O-480	285	66	57	11	—	—	—	—	—	—
O-470	173	—	—	—	—	—	—	—	—	—
O-335	—	—	—	—	—	—	—	—	—	—
O-526	—	—	—	—	—	—	—	—	—	—
O-525	—	—	—	—	—	—	—	—	—	—
R-1340	22	—	—	—	—	—	—	—	—	—
R-1820	506	155	418	282	241	155	175	92	45	—
R-3350	87	113	93	124	—	—	—	—	—	—
R-1300	11	—	—	—	—	—	—	—	—	—
R-2800	70	—	—	—	—	—	—	—	—	—

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



Spending for procurement of guided missiles by the Department of Defense rose slightly in Fiscal Year 1969 and is expected to continue to climb in FY 1970 and 1971.

With dollar outlays for procurement increasing in all three services, total DoD missile procurement expenditures rose from $2.219 billion in FY 1968 to $2.509 billion in FY 1969. The total figure for missile research, development, test and evaluation fell off slightly, however, from $2.522 in FY 1968 to $2.410 billion in FY 1969. A slight further drop in RDT&E funding is anticipated for FY 1970, followed by a small increase in FY 1971.

As in the past several preceding years, the principal impetus for greater expenditures came from the effort to replace existing weapons with improved units and to undertake development and deployment of Safeguard, an operational anti-ballistic-missile system.

Net sales of missile systems and parts during 1969 declined slightly to $2.686 billion, from $2.812 billion in 1968. Backlog as of December 31 slipped more substantially, from $3.218 billion to $2.364 billion.

Sales of propulsion systems for missiles and space vehicles, which had declined by $71 million from 1967 to 1968, fell off by another $205 million in 1969, to a total of $702 million. Nearly all of the decrease resulted from cutbacks in non-military systems. Non-defense sales slumped from $231 million to $35 million, while military sales were nearly stable, at $667 million in 1969 compared with $676 million in the previous calendar year. The backlog of military sales actually showed a substantial rise, from $406 million to $485 million, while non-military backlog plummeted from $129 million to $12 million.

Defense Secretary Laird announced in his defense posture statement in February 1970 that the planned strategic missile force for FY 1971 would be similar to that presented earlier—1,000 Minuteman missiles, 54 Titan II's and 656 submarine-launched ballistic missiles (Polaris and Poseidon).

He also noted that the Short Range Attack Missile (SRAM) had entered final development. SRAM is an air-to-surface missile designed to

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[r]	2,157
1967	2,877	3,121
1968	2,812	3,218[r]
1969	2,686	2,364

NOTE: Based on data from about 60 companies engaged in the manufacture of aerospace products. Data exclude sales of military engines and propulsion units. (See page 45).

[r] Revised.

Source: Bureau of the Census, "Current Industrial Reports," Series M37D (Quarterly).

be carried on B-52 G/H, FB-111 and B-1 aircraft for use against terminal defenses. There is as yet no commitment to production of SRAM, pending final testing.

Work on the Subsonic Cruise Armed Decoy (SCAD), an advanced bomber penetration aid against area defenses, is continuing through the definition phase. Two contractors may be chosen to develop prototype flight vehicles.

Also in the works is further design study of the new Undersea Long Range Missile System (ULMS).

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

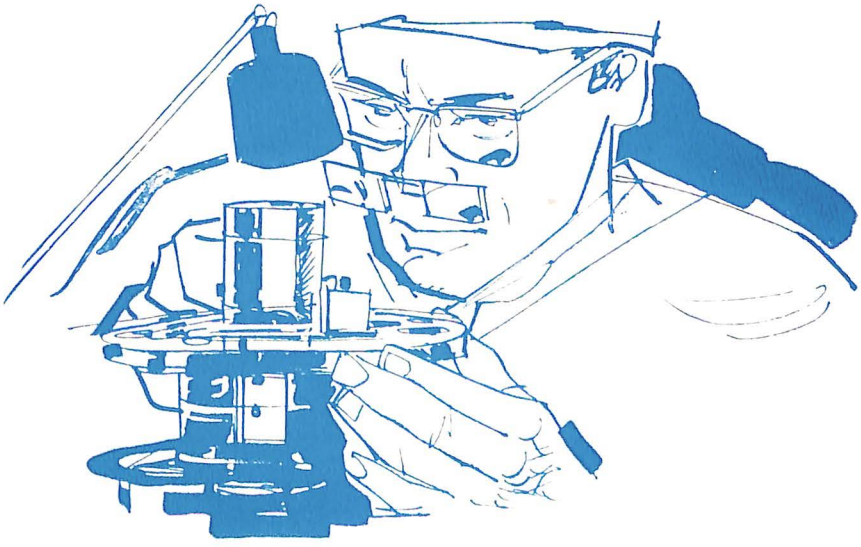
Year Ending June 30	TOTAL DEFENSE DEPARTMENT	Air Force	Navy	Army
1951	$ 21	$ 16	$ 5	—
1952	169	66	56	$ 46
1953	245	N.A.	N.A.	N.A.
1954	417	N.A.	N.A.	N.A.
1955	604	N.A.	N.A.	N.A.
1956	1,005	N.A.	N.A.	N.A.
1957	1,855	N.A.	N.A.	N.A.
1958	2,434	N.A.	N.A.	N.A.
1959	3,337	N.A.	N.A.	N.A.
1960	3,027	2,021	423	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[E]	2,919	1,475	633	811
1971[E]	3,203	1,496	791	916

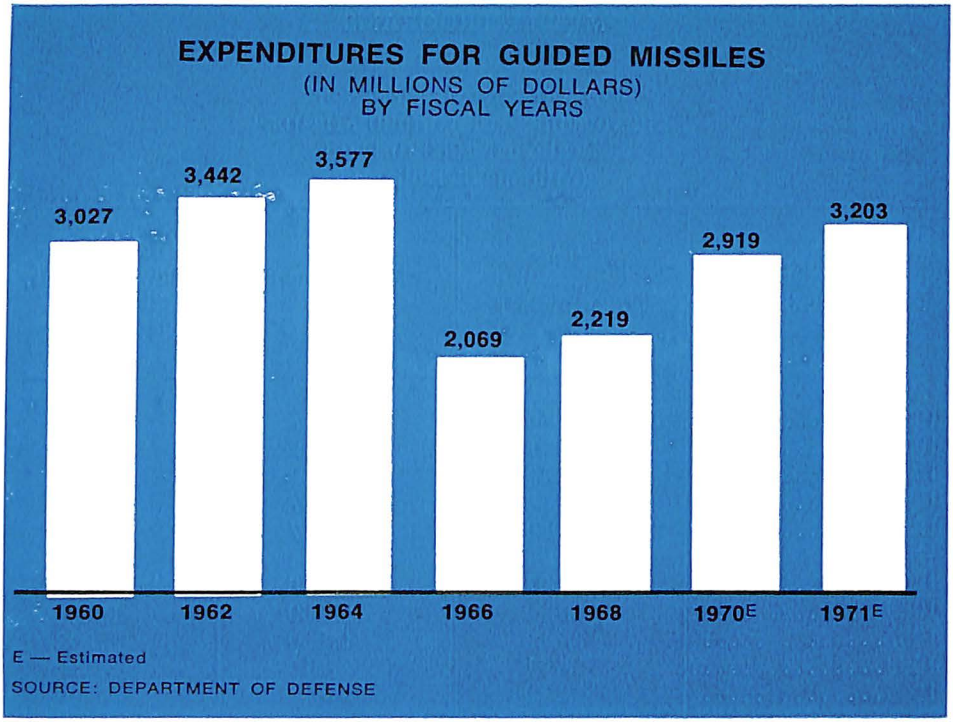
NOTE: For data on research and development expenditures for missiles see pages 45 and 64.
N.A.—Not available.
[E] Estimate.
Source: Department of Defense, Report "FAD 647", February 3, 1970, and earlier reports.

DEPARTMENT OF DEFENSE
EXPENDITURES 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[E]	5,078	2,919	2,159
1971[E]	5,503	3,203	2,300

NOTE: Does not include military assistance.
[E] Estimate
Source: Department of Defense, Reports "FAD 647, 648", February 3, 1970.





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

Year Ending December 31	Net Sales During Year			Backlog as of Dec. 31		
	TOTAL	Military	Non-Military	TOTAL	Military	Non-Military
1961	N.A.	$ 784	[a]	N.A.	$367	[a]
1962	N.A.	1,060	[a]	N.A.	498	[a]
1963	$1,675	1,135	$522	$ 888	699	$189
1964	1,579	851	728	1,024	557	467
1965	1,288	560	728	883	513	370
1966	1,211	511	700	859	534	325
1967	978	441	537	609	405	204
1968	907	676	231	535	406	129
1969	702	667	35	497	485	12

NOTE: Based on data from about 60 companies engaged in th anufacture of aerospace products The figures are inflated by the inclusion of subcontracts.
N.A.—Not available.
[a] Data included in totals for space vehicle system. See page 59.
Source: Bureau of the Census, "Current Industrial Reports," Series M37D (Quarterly).

MAJOR MISSILES IN DEVELOPMENT OR PRODUCTION

Project	Service	Systems Contractor	Propulsion		Guidance Mfr.	Status
			Manufacturer	Type		
SURFACE-TO-AIR						
ASMS	USN			—		Development
Bomarc B	USAF	Boeing	Marquardt	Solid	Westinghouse	Operational
Chaparral	Army	Philco/Ford	NAR/Rocket-dyne	—	GE/Raytheon	Operational
Hawk	Army	Raytheon	Aerojet	Solid	Raytheon	Operational
Nike-Hercules	Army	Western Electric	Thiokol/ Hercules	Solid	Bell Tel. Lab/West. Electric	Operational
Redeye	Army	General Dynamics	Atlantic Research	Solid	Norden	Operational
Sam-D	Army	Raytheon	Thiokol	Solid	—	Development
Sea Sparrow	USN	Raytheon	NAR/Rocket-dyne		Raytheon	Development
Sentinel/ Spartan	Army	Bell Tel. Lab/ Western Electric	Thiokol		BTL/WE	Development
Sentinel/ Sprint	Army	Bell Tel. Lab/ Western Electric	Hercules	—	BTL/WE	Development
Standard (MR)	USN	General Dynamics	Aerojet	—	General Dynamics	Operational
Standard (ER)	USN	General Dynamics	Atlantic Research		General Dynamics	Operational
Talos	USN	Bendix	Bendix	Ramjet	Bendix	Operational
Tartar	USN	General Dynamics	Aerojet	Solid	GD	Operational
Terrier	USN	General Dynamics	Atlantic Research	Solid	GD	Operational
AIR-TO-AIR						
Falcon	USAF	Hughes	Thiokol	Solid	Hughes	Operational
Falcon	USAF	Hughes	Lockheed Propulsion		Hughes	Operational
Super Falcon	USAF	Hughes	Thiokol		Hughes	Operational
Nuclear Falcon	USAF	Hughes	Thiokol		Hughes	Operational
Genie	USAF	McDonnell-Douglas	Aerojet/ Thiokol	Solid	—	Operational
Phoenix	USN	Hughes	NAR/Rocket-dyne	Solid	Hughes	Development
Sidewinder 1A	USN	Naval Weapons/ Philco/ GE	Naval Propulsion Plant	Solid	Philco/GE	Operational
Sidewinder 1C	USN	Naval Weapons/ Philco/ Raytheon	NAR/Rocket-dyne		Philco/ Raytheon	Operational
Sparrow 3	USN	Raytheon	NAR/Rocket-dyne	Solid	Raytheon	Operational

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	Solid	GM/AC Electronics	Operational
Minuteman	USAF	Boeing	Thiokol/ Aerojet/ Hercules	Solid	NAR/Auto-netics	Operational
Polaris	USN	Lockheed	Aerojet/ Hercules	Solid	GE/MIT/ Hughes/ Raytheon	Operational
Poseidon	USN	Lockheed	Thiokol/ Hercules		GE/MIT/ Raytheon	Development
Titon	USAF	Martin Marietta	Aerojet		GM/AC Electronics	Operational
AIR-TO-SURFACE						
Bullpup A	USN	Maxon Electronics	Thiokol/ Reaction	Solid	Maxon Electronics	Operational
Bullpup B	USN	Maxon Electronics	Thiokol/ Reaction	Solid	Maxon Electronics	Operational
Cobra	USAF					Research
Condor	USN	Naval Systems Command/ NAR	NAR/Rocket-dyne		Hughes	Development
Hornet	USAF	NAR/Cal				Development
Hound Dog	USAF	NAR	P&W		NAR/Auto-netics	Development
Maverick	USAF	Hughes/NAR				Development
Quail	USAF	McDonnell-Douglas	GE		McDonnell-Douglas	Operational
SCAD	USAF					Research
Viper	USAF	Chrysler	Thiokol/ RMD			Development
Shrike	USN	Naval Weapons	Tex. Instru./ Sperry Rand/ Bristol	Solid	Tex. Instru./ Sperry/ Bristol	Operational
SRAM	USAF	Boeing	Lockheed Propulsion		General Precision	Development
Standard ARM	USN	General Dynamics	Aerojet		Tex. Instru.	Operational
Walleye	USN	Martin Marietta Hughes		Glide Bomb	Martin Marietta	Operational
Blueye	USAF	Martin Marietta	Thiokol			Development
			Thiokol			Development
Viper	USAF	Chrysler	Thiokol			Development

MAJOR MISSILES IN DEVELOPMENT OR PRODUCTION—*Continued*

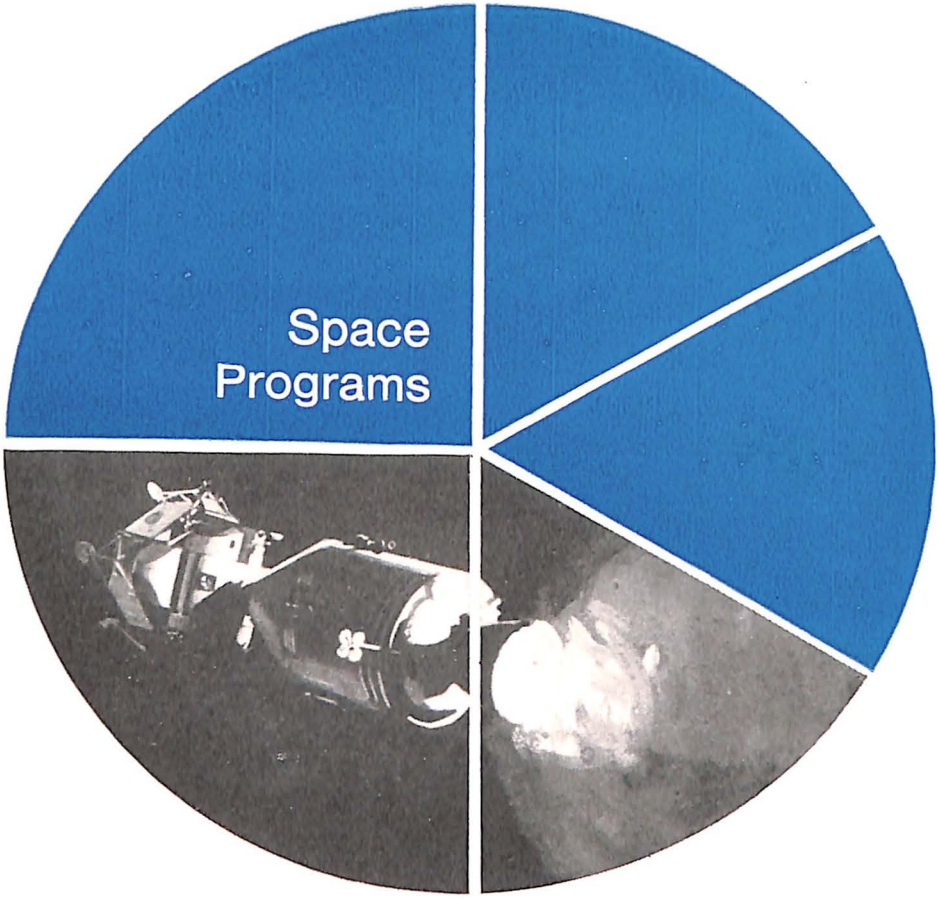
Project	Service	Systems Contractor	Propulsion		Guidance Mfr.	Status
			Manufacturer	Type		
BATTLEFIELD SUPPORT GUIDED MISSILES						
Lance	Army	LTV	LTV Aerospace	Solid	LTV Systems/ Donner/ Arma	Development
Dragon	Army	McDonnell-Douglas			Conductron	Development
Pershing	Army	Martin Marietta	Thiokol	Solid	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/ Hercules		Nord	Operational
TOW	Army	Hughes	Hercules	Solid		Development
UNGUIDED MISSILES						
Honest John	Army	McDonnell-Douglas	Hercules	Solid		Operational
ZAP	USN	Naval Ordnance	Martin Marietta			Development
ANTI-SUBMARINE						
Asroc	USN	Honeywell	Naval Propulsion Lab	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

Source: Air Force Systems Command.



America's investment in space exploration yielded its most dramatic payoff in 1969, more than meeting the national goal set in 1961 of landing men on the moon and returning them safely before the end of the decade.

Astronauts Neil A. Armstrong, Michael Collins and Edwin E. Aldrin, Jr., lifted off from Cape Kennedy July 16 atop a Saturn V launch vehicle to undertake the first manned lunar landing mission. The entire world watched and listened on live television as Armstrong set foot on the moon —his historic "one small step for a man, one giant leap for mankind."

The second lunar landing mission, Apollo 12, was launched from the Cape on Nov. 14, carrying Astronauts Charles Conrad, Jr., Richard F. Gordon, Jr., and Alan L. Bean.

In preparation for the lunar landings, two manned Apollo flights were conducted earlier in the year to complete test and demonstration of the

system. Apollo 9, launched on March 3, successfully simulated in Earth orbit the operation of the Lunar Module descent and ascent engines. Apollo 10, begun on May 18, traveled to within 47,000 feet of the lunar surface, making two low-orbit passes over the prospective landing site for Apollo 11.

The unmanned space exploration effort was highlighted during the year by the flight of two Mariner spacecraft past separate regions of Mars. Launched on Feb. 24 and March 27, respectively, Mariners VI and VII encountered Mars on July 31 and Aug. 5. The two spacecraft returned a vast amount of new information on the planet and its atmosphere.

Other unmanned launches included the fifth and sixth Orbiting Solar Observatories and the sixth Orbiting Geophysical Observatory; an Interplanetary Monitoring Platform; three cooperative international satellites; the third Biosatellite; two Intelsat communications satellites (launched for Comsat Corp.); a fifth Applications Technology Satellite (partially successful); and two meteorological satellites—Nimbus III and the operational weather satellite ESSA 10 (for the Department of Commerce).

Military space plans were reduced sharply with the cancellation on June 10 of the Manned Orbiting Laboratory (MOL) program, the only Department of Defense manned space project.

Significant successes achieved by DoD in 1969 included the placing into geostationary orbit of the first Tactical Communications Satellite (Tacsat

SPACECRAFT LAUNCHINGS AS OF MARCH 6, 1970

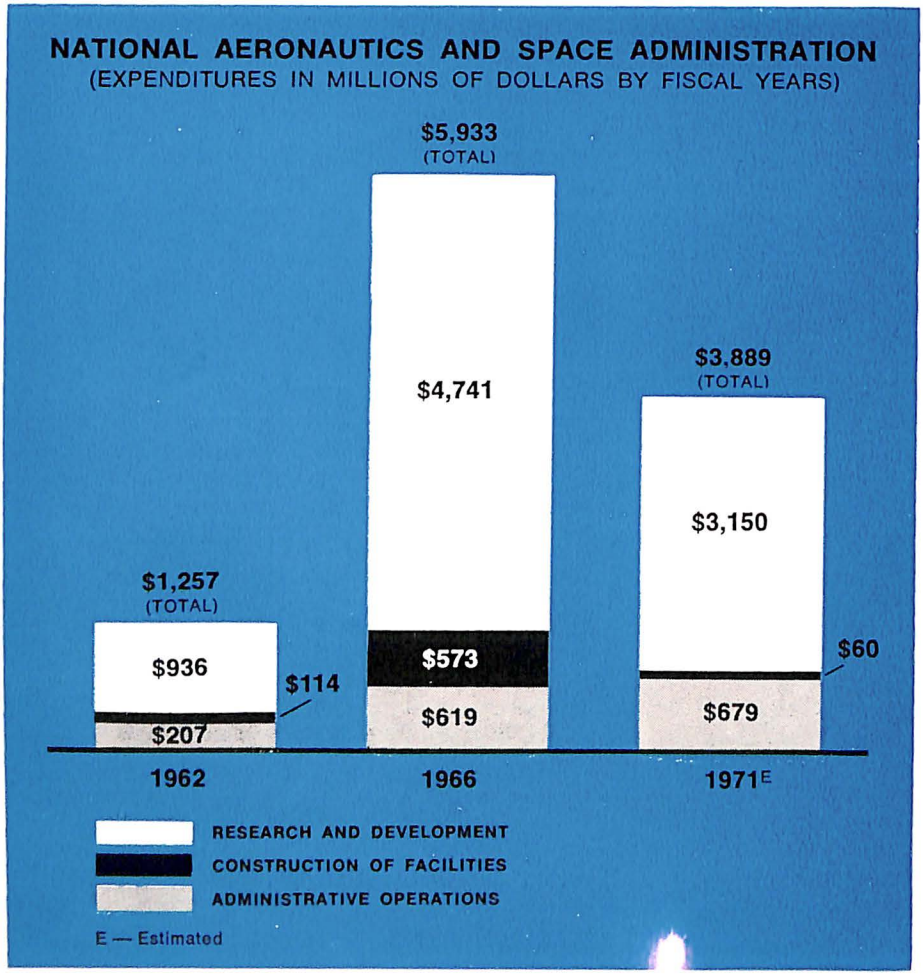
Country	TOTAL	Payloads in Earth Orbit	Payloads Decayed	Space Probes
TOTAL	1,082	382	668	32
United States	647	289	340	18
U.S.S.R.	413	76	323	14
Canada	3	[r]3	—	—
United Kingdom	4	[r]3	1	—
France	5	5	—	—
Italy	2	—	2	—
Australia	2	1	1	—
European Space Research Organization	4	3	1	—
Germany	1	1	—	—
Japan	1	1	—	—

Source: National Aeronautics and Space Administration.

I) on Feb. 9, and the launching into circular orbit of the fifth pair of Vela nuclear detection satellites on May 23.

In addition to launching seven scientific satellites and approximately a score of classified satellites, DoD continued to operate its global communications, satellite navigation and geodetic systems, although no new spacecraft were added to existing networks.

The Atomic Energy Commission completed the technology phase of the NERVA nuclear rocket program with completion of the ground-experimental engine test series. NERVA engine design and development work proceeded toward its target of a reusable 75,000-pound-thrust engine. A SNAP-27 isotopic generator provided the electrical power



UNITED STATES SPACE LAUNCHINGS
1957 to Date

Year	Earth Satellite Attempts		Escape Payload Attempts	
	Success	Failure	Success	Failure
1957	—	1	—	—
1958	5	8	—	4
1959	9	9	1	2
1960	16	12	1	2
1961	35	12	—	2
1962	54	12	4	1
1963	60	11	—	—
1964	69	8	4	—
1965	94	8	3	—
1966	95	12	5	1[a]
1967	77	4	10	—
1968	61	3	3	—
1969	50	1	8	—
TOTAL	625	101	39	12

NOTE: Information contained in this table is drawn from unclassified sources. Numbers are given in terms of separate payloads placed in earth orbit, sent to the moon, or placed in solar orbit. Included in the totals are payloads that went into orbit or escape trajectory but failed to perform their mission; this accounts for the discrepancy between totals in this table and the NASA-supplied table on p. 49, since NASA does not regard such launches as successes.

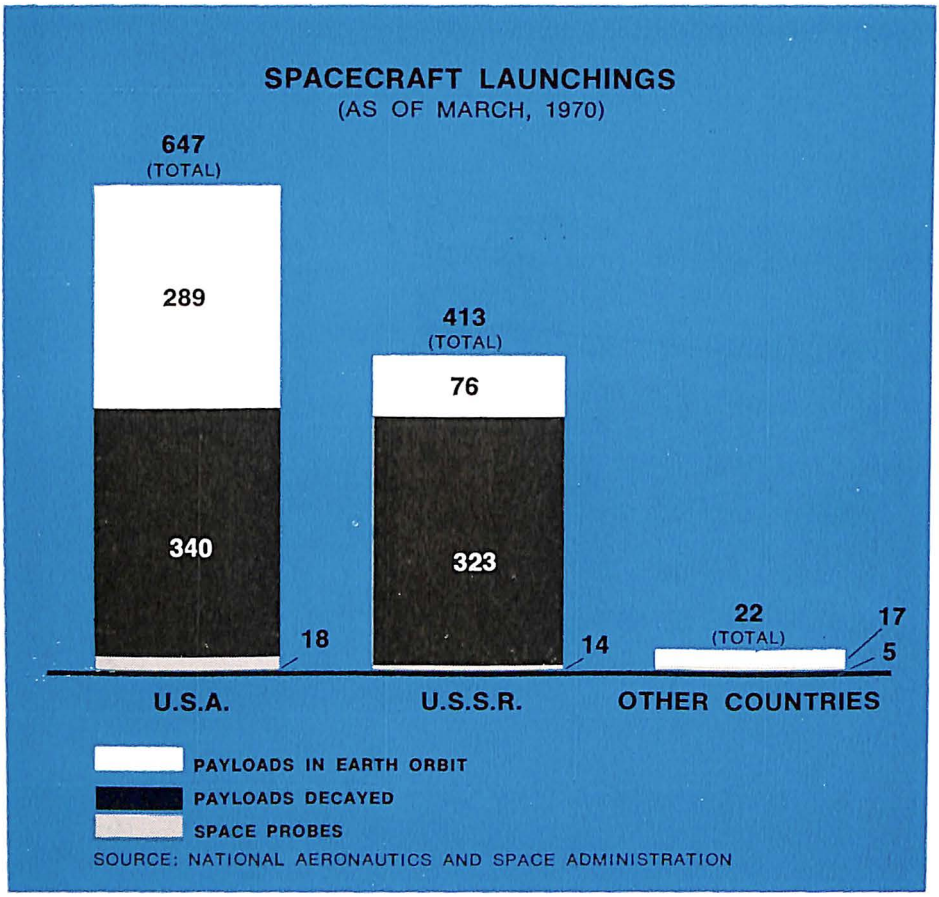
[a] Failed to go to escape as intended, but did attain earth orbit.

Source: National Aeronautics and Space Council, "Report to the Congress from the President of the United States" (Annually).

source for an experiment package left on the lunar surface by Apollo 12 astronauts, and two SNAP-19 radioisotope thermoelectric generators were launched aboard the Nimbus III weather satellite to supply power.

As in previous years, other government agencies participated significantly in the space program. Among them were the Environmental Science Services Administration of the Department of Commerce, which continued to operate its ESSA weather satellite network and conducted studies of future meteorological systems; the Departments of Interior and Agriculture, which worked jointly with NASA toward further development of Earth resources observation spacecraft; and the National Science Foundation.

Estimates of space expenditures in Fiscal Year 1970 represented a decline of more than $600 million from the previous year's level. The decrease was largely caused by two factors: the reduced costs of vehicles



and equipment for Apollo, which have declined steadily since their peak in 1966, and cancellation of the DoD's Manned Orbiting Laboratory project. Some additional spending cuts were made as a result of pressures on the overall Federal budget.

Total FY 1970 expenditures were estimated at $5.666 billion. Of this amount, $3.71 billion is for NASA, $1.82 billion for DoD, $103 million for AEC, and $33 million for other agencies. The NASA figure was down $373 million from actual expenditures in FY 1969. DoD declined by $275 million. AEC and other agencies were only slightly reduced.

Despite the windup of Apollo hardware production, manned space flight continued to draw about two thirds of NASA's budget—more than $2 billion in FY 1970. This figure is expected to drop sharply in FY 1971.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
RESEARCH AND DEVELOPMENT PROGRAMS BUDGET PLAN
(Millions of Dollars)

	Fiscal Years Ending June 30			
	1968	1969	1970	1971
TOTAL	$3,967	$3,193	$3,114	$2,606
MANNED SPACE FLIGHT—				
TOTAL	2,809	2,177	2,032	1,474
Apollo	2,556	2,025	1,686	957
Space flight operations	253	150	343	515
Advanced missions	—	2	3	2
SPACE SCIENCE AND APPLICATIONS—TOTAL	553	438	520	566
Physics and astronomy	140	125	112	116
Lunar and planetary exploration	148	82	151	145
Bioscience	42	33	20	13
Space applications	99	98	128	167
Launch vehicle procurement	124	100	109	125
ADVANCED RESEARCH AND TECHNOLOGY—TOTAL	315	285	272	264
Basic research	21	21	19	18
Space vehicle systems	34	32	31	30
Electronics systems	38	35	33	22
Human factor systems	20	19	22	18
Space power and electric propulsion systems	44	42	34	31
Nuclear rockets	54	32	37	38
Chemical propulsion	37	29	20	20
Aeronautical vehicles	67	75	76	87
TRACKING AND DATA ACQUISITION—TOTAL	276	280	278	298
UNIVERSITY AFFAIRS—TOTAL	10	9	7	—
Sustaining university program	10	9	7	—
TECHNOLOGY UTILIZATION— TOTAL	4	4	5	4

Note: Administrative operations costs for NASA are not included.
Source: National Aeronautics and Space Administration Briefing on the Budget of the United States, February 2, 1970.

Launch Date	Project	Pilot	Nation	Duration
Orbital				
Mar 18, 1965	Voskhod II	Pavel Belyayev Alexei Leonov	USSR	26 hr. 2 min.
Mar 23, 1965	GT-3	Virgil I. Grissom John W. Young	USA	4 hr. 53 min.
June 3, 1965	GT-4	James A. McDivitt Edward H. White II	USA	97 hr. 56 min.
Aug 21, 1965	GT-5	L. Gordon Cooper Charles Conrad, Jr.	USA	190 hr. 55 min.
Dec 4, 1965	GT-7	Frank Borman James A. Lovell Jr.	USA	330 hr. 36 min.
Dec 15, 1965	GT-6[a]	Walter M. Schirra, Jr. Thomas P. Stafford	USA	25 hr. 51 min
Mar 16, 1966	GT-8	Neil A. Armstrong David R. Scott	USA	10 hr. 41 min.
June 8, 1966	GT-9	Thomas P. Stafford Eugene A. Cernan	USA	72 hr. 21 min.
July 18, 1966	GT-10	John W. Young Michael Collins	USA	70 hr. 47 min.
Sept 12, 1966	GT-11	Charles Conrad, Jr. Richard F. Gordon, Jr.	USA	71 hr. 17 min.
Nov 11, 1966	GT-12	James A. Lovell, Jr. Edwin E. Aldren, Jr.	USA	94 hr. 35 min.
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
Mar 3, 1969	Apollo 9	James A. McDivitt David R. Scott Russell L. Schweikart	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	Georgiy Shonin Valeriy Kubasov	USSR	118 hr. 21 min.
Oct 12, 1969	Soyuz 7	Anatoliy Filipchenko Vladislav Volkov Viktor Gorbatko	USSR	118 hr. 43 min.
Oct 13, 1969	Soyuz 8	Vladimir Shatalov Aleksey 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.

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

[a] Mission originally scheduled October 25, 1965, postponed when Agena target vehicle failed to achieve orbit.

Source: National Aeronautics and Space Administration.

CHRONOLOGY OF MAJOR UNITED STATES SPACE LAUNCHINGS, 1969 TO DATE

Date	Designation	Purpose
1969		
Jan 22	OSO V	Solar Physics
Jan 30	ISIS-A	International satellite for Ionospheric Studies. Third mission in a series of five in the cooperative U.S./Canadian space program
Feb 5	Intelsat III F-3	Communications
Feb 24	Mariner VI	Planetary/interplanetary exploration
Feb 26	ESSA IX	Meteorology
Mar 3	Apollo IX	First manned flight of all Manned Lunar Landing hardware in earth orbit. James McDivitt, David Scott and Russell Schweickart.
Mar 27	Mariner VII	Planetary/Interplanetary Exploration. Spacecraft identical to Mariner VI.
Apr 14	Nimbus III	Meteorology.
May 18	Apollo X	Manned lunar mission development flight to evaluate Lunar Module performance in the cislunar and lunar environment. Astronauts: Thomas P. Stafford, John W. Young and Eugene A. Cernan.
May 22	Intelsat III F-3	Global telecommunications satellite.
Jun 5	OGO-VI (OGO-F)	Interdisciplinary Studies.
Jun 21	Explorer XLI	Particles and Fields—environment study of Earth's magnetosphere during period of high solar activity.
Jun 29	Biosatellite III	Biology.
Jul 24	Apollo XI	First manned lunar landing mission. Assess capability and limitations of an astronaut and his equipment in the lunar environment. Astronauts: Neil A. Armstrong, Michael Collins and Edwin E. Aldrin, Jr.
Jul 26	Intelsat III F-4	Global telecommunications satellite.
Aug 9	OSO-VI (OSO-G)	Solar Physics.
Aug 12	ATS-V (ATS-E)	Application and Technology.
Aug 27	Pioneer E	To obtain polar plasma magnetic field, and cosmic-ray measurements near the orbital path of the earth but outside the earth's region of influence.
Oct 1	ESRO-1S	Non-NASA Mission. Second satellite of the European Space Research Organization Project.
Nov 14	Apollo XII	Second manned lunar landing mission. Demonstrated point landing capability, sampled more area, investigated Surveyor III spacecraft, obtained photographs of candidate exploration sites. Astronauts: Charles Conrad, Jr., Richard F. Gordon, Jr., and Alan L. Bean.
Nov 22	Skynet-A	Communications.

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.

Vehicle	Stages	Thrust (in thousands of pounds)	Payload (pounds)	
			300 Nautical miles Orbit	Escape
Scout	1. Algol (IIB)*	88	320	50
	2. Castor II*	60.5		
	3. Antares II*	22		
	4. Altair III*	5.9		
Thor Delta	1. Thor (DSV-3E-1)	169	950	150
	2. Delta (DSV-3)	7.1		
	3. FW-4D*	5.8		
Thrust Augmented Thor Delta	1. Thor (DSV-3E-1) plus three TX33-52*	169 plus 54 each	1,275	275
	2. Delta (DSV-3)	7.1		
	3. FW-4D*	5.8		
Thor Agena	1. Thor (DM-21)	170	1,600	—
	2. Agena	16		
Thrust Augmented Thor Agena	1. Thor (DM-21) plus 3 TX 33–52*	170 plus 54 each	2,200	—
	2. Agena	16		
Atlas Agena	1. Atlas Booster and Sustainer	338	6,300	1,150
	2. Agena	16		
Titan II (GLV)	1. Two LR-87	430	(8,000 @ 105 NM)	—
	2. LR-91	100		
Titan IIIA	1. Two LR-87	430	5,000	—
	2. LR-91	100		
	3. Agena	16		
Titan IIIB	1. Two LR-87	430	7,700	1,700
	2. LR-91	100		
	3. Agena	16		
Titan IIIC	1. Two 5-segment 120″ diameter*	2,400	23,000	5,000
	2. Two LR-87	430		
	3. LR-91	100		
	4. Transtage	16		

(*Continued on next page*)

UNITED STATES SPACE LAUNCH VEHICLES—*Continued*

Vehicle	Stages	Thrust (in thousands of pounds)	Payload (pounds)	
			300 Nautical miles Orbit	Escape
Atlas Centaur	1. Atlas Booster and sustainer	388	8,500	2,300
	2. Centaur (Two RL-10)	30		
Uprated Saturn I	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	98,000
	2. S-II (5J-2)	1,125	(285,000 @ 105 NM)	
	3. SIVB (1 J-2)	225		

* Solid propellant, all other are liquid.
Source: National Aeronautics and Space Administration

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	Administrative Operations
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[E]	3,889	3,150	60	679
1971[E]	3,403	2,638	72	693

[E] Estimate.
Source: "The Budget of the United States Government", (Annually).

SALES AND BACKLOG OF SPACE VEHICLE SYSTEMS
(Excluding Engines and Propulsion Units)
Reported by Ma or Manufacturers
1961 to Date
(Mill'ons of Dollars)

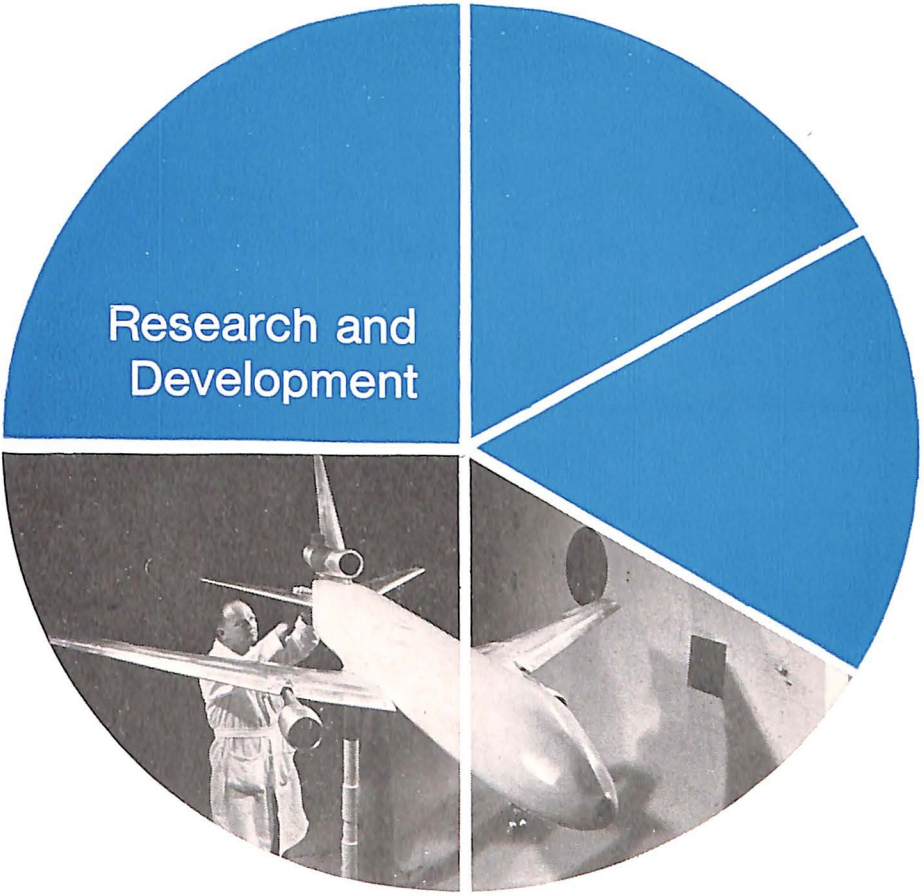
Year Ending December 31	Net Sales During Year			Backlog, December 31		
	TOTAL	Military[a]	Non-military	TOTAL	Military[a]	Non-military
1961	$ 775	$ 551	$ 224[a]	$ 586	$ 350	$ 236[a]
1962	1,319	712	607[a]	1,435	852	583[a]
1963	1,911	1,061	850	1,612	856	756
1964	2,222	732	1,490	1,611	391	1,220
1965	2,449	602	1,847	2,203	503	1,700
1966	2,710	734	1,967	1,494	428	1,066
1967	2,199[r]	789	1,410[r]	1,974	1,096	878
1968	2,357[r]	899[r]	1,458	1,329	834	495
1969	2,272	1,181	1,091	1,330	869	461

NOTE: Based on data from about 60 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 M37D (Quarterly).

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

Source: National Aeronautics and Space Administration.



Research and development spending by the federal government declined for the second consecutive year in Fiscal Year 1970, but still remained at a high level. From an all-time peak of $16.865 billion in FY 1968, R&D spending fell to $16.164 billion in FY 1969 and an estimated $15.889 billion in FY 1970. A smaller decrease is anticipated for FY 1971.

Reduced aerospace R&D spending by the government accounted for the over-all decrease from 1969 to 1970. Department of Defense expenditures fell from $4.6 billion to $4.428 billion, NASA from $4.251 billion to $3.889 billion. Aggregate spending on aerospace R&D by the Atomic Energy Commission, the Department of Transportation and other government agencies was estimated to have remained stable at $200 million-plus. Thus, there was a drop in the aerospace R&D total from approximately $9 billion in FY 1969 to about $8.5 billion.

(It is necessary to qualify these totals somewhat, since budget ac-

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 Administration	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	16,164	7,858	4,252	1,654	2,400
1970[E]	15,889	7,714	3,889	1,623	2,663
1971[E]	15,696	7,782	3,403	1,640	2,871

[E] Estimate.
NOTE: Includes military personnel, procurement, civil functions, and some other items not included in other tables. Includes R&D facilities, and administrative operating costs.
Source: "The Budget of the United States Government", (Annually).

counts treat all NASA expenditures as R&D. In fact, $721 million of the FY 1969 NASA expenditures of $4.252 billion was for construction of facilities and administrative operations; the corresponding figure in FY 1970 estimates is $739 million. See preceding chapter on Space Programs.)

Company-initiated expenditures for R&D, which rose to a total of $1.070 billion in 1967, far exceeding previous years' outlays, climbed slightly higher in 1968, to $1.148 billion. This trend reflects the increasing need to spend more on in-house R&D in order to remain competitive in meeting the demands of increasing performance and complexity in defense and space systems.

Spending by the Department of Defense falls into the categories of

aircraft, missiles and astronautics. In aircraft research and development, some of the major events of 1969 were further flight-testing of the USAF's C-5A Galaxy heavy logistics transport, the world's largest aircraft, bringing total flying time to well over 1,300 hours; initiation of engineering development of the F-14 carrier-based tactical fighter; award of the development and production contract for the Air Force's new air superiority tactical fighter, the F-15; and continued testing of the EA-6B Navy tactical countermeasure aircraft.

In missile activity, there was further conversion of Fleet Ballistic Missile Submarines from Polaris to the improved Poseidon missiles. The Safeguard anti-ballistic missile (ABM) system was initiated.

DEPARTMENT OF DEFENSE
EXPENDITURES 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[E]	7,300	3,050	2,140	1,640	470
1971[E]	7,383	3,068	2,165	1,664	486

NOTE: For RDT&E for aircraft, missiles and astronautics *only*, see page 64.
N.A.—Not available.
[E] Estimate.
Source: Department of Defense, Report "FAD 648", February 3, 1970.

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

Year Ending June 30	TOTAL, ALL RDT&E FUNCTIONS	AEROSPACE				Other
		TOTAL	Aircraft	Missiles	Astronautics	
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[E]	7,300	4,428	1,530	2,159	739	2,872
1971[E]	7,382	4,451	1,488	2,300	663	2,931

[E] Estimate.
Source: Department of Defense, Report "FAD 648", February 3, 1970.

DoD astronautics work was highlighted by completion of the flight-test phase of the Titan IIIC program: the big booster successfully launched the first Tactical Communication Satellite (Tacsat) and a pair of Vela nuclear detection satellites. The Air Force's Manned Orbiting Laboratory (MOL) project, was cancelled during the year, and with it the Titan IIIM booster project. Approximately 20 classified payloads were put into orbit, and seven scientific satellites were successfully launched.

For the civilian space program, 1969 was a year of triumphant culmination. Two members of the Apollo 11 crew became the first humans to land on another celestial body. Their mission, launched on July 16, was followed on Nov. 14 by the Apollo 12 flight. Earlier in the year, Apollo 9 and Apollo 10 were flown; the first simulated in Earth orbit the functions of the Lunar Module engines, and second traveled close to the Moon's surface to study the Apollo 11 landing site.

Two manned Apollo missions were scheduled for 1970. The first, Apollo 13, was aborted short of a lunar landing when an explosion occurred in the Service Module en route to the Moon. Using the Lunar Module and its supplies as a "lifeboat," the three-man crew returned to a safe landing in the Pacific on April 17.

Unmanned NASA space exploration included the flight of two Mariner spacecraft past Mars, returning a wealth of new data; successful launches of two Orbiting Solar Observatories, and Interplanetary Monitoring Platform, three cooperative international satellites, a Biosatellite, two Intelsat communications satellites (launched for Comsat Corp.), an Applications Technology Satellite and two meteorological satellites.

Aerospace R&D of the Atomic Energy Commission proceeded with

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[r]	16,415	5,570	4,499	1,070
1968	17,435	5,651	4,503	1,148

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.
[r] Revised.
Sources: National Science Foundation, Aerospace Industries Association.

the windup of ground-experimental engine testing for the NERVA nuclear rocket program. Also, an experiment package left on the Moon by Apollo 12 astronauts contained a SNAP-27 isotopic generator as its electrical power source, and the Nimbus III weather satellite went into orbit with two SNAP-19 radioisotope thermoelectric generators to supply power.

Other Government agencies were also involved in aerospace R&D. The Department of Transportation continued its supervision of the supersonic transport program. The Environmental Science Services Administration of the Department of Commerce maintained its ESSA weather satellite system and pursued investigations of future weather networks. The Departments of Interior and Agriculture cooperated with NASA on further development of plans for Earth resources satellites. The National Science Foundation continued its support of a wide range of projects.

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

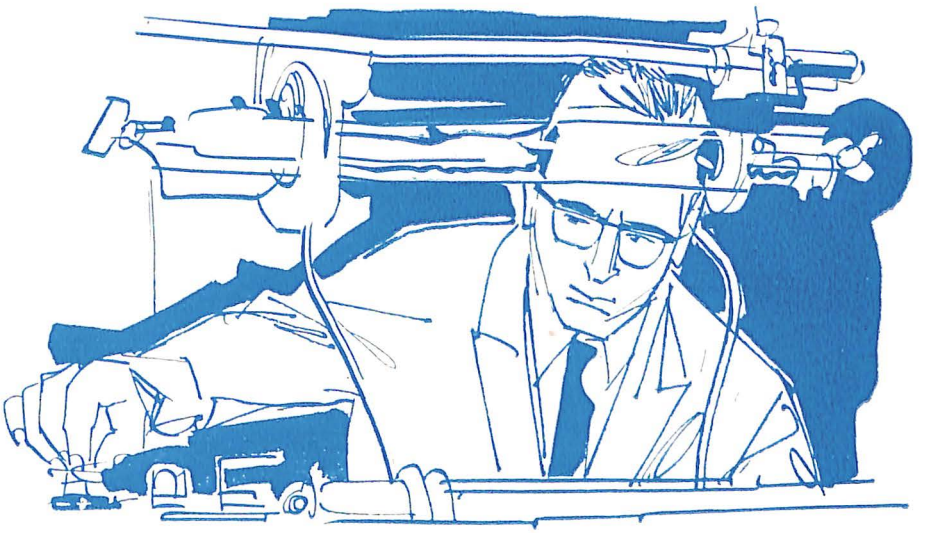
Year Ending December 31	Total Aerospace	Applied Research and Development Funds			Basic Research Funds		
		Total	Federal Government Contracts	Company	Total	Federal Government Contracts	Company
1957	$2,574	$2,549	N.A.	N.A.	$25	N.A.	N.A.
1958	2,609	2,583	$2,266	$317	26	$10	$16
1959	3,090	3,058	2,733	325	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[r]	5,570	5,500	4,479[a]	1,022[a]	70	33[a]	38[a]
1968	5,651	5,585	4,478	1,107	66	25	41

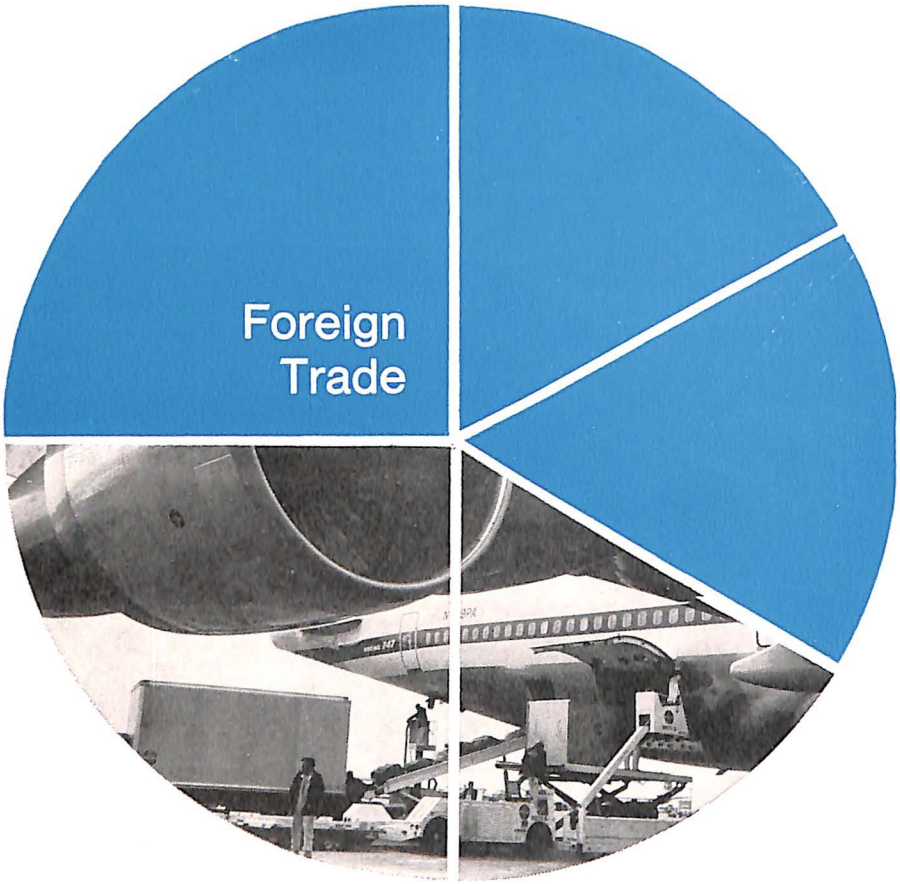
N.A.—Not available.
[r] Revised.
[a] Estimated by the National Science Foundation. Revised data not collected.
Source: National Science Foundation, Aerospace Industries Association.

Research and Development Expenditures
(Other than Department of Defense, National Aeronautics and Space Administration and Atomic Energy Commission)
Fiscal Years 1969 to 1971
(Millions of Dollars)

Department or Agency	Actual	Estimate	
	Years ending June 30		
	1969	1970	1971
Total	$1,982	$2,134	$2,267
Agriculture	257	264	286
Commerce	55	63	65
Health, Education and Welfare	1,086	1,153	1,183
Interior	151	169	187
Transportation	38	51	62
National Science Foundation	262	284	307
Veterans Administration	48	55	56
Other	84	96	121

Note: Includes research and development only; does not include support of research in colleges and universities or research and development facilities.
Source: "The Budget of the United States Government" (Annually).





Aerospace exports advanced during 1969 to a record $3.2 billion, exceeding the previous high in 1968 by 5.2 percent. Exports represented 11.7 percent of the industry's total sales and 1969 was the thirteenth year in which export sales exceeded $1 billion.

The aerospace trade balance reached a new high of $2.8 billion in 1969 increasing 6.9 percent over 1968. The aerospace industry again ranked as one of the nation's principal manufacturing export industries in 1969.

Civilian aerospace exports declined from $2.2 billion in 1968 for a drop of 12.5 percent to $1.9 billion in 1969. Military aerospace exports advanced to $1.2 billion in 1969 over $766 million in 1968 for an increase of 57.2 percent.

Commercial transport exports in 1969 exceeded the 1967 units and values, but were off appreciably from 1968 figures. Total commercial transport aircraft in 1969 declined 24.9 percent in units from 240 in 1968 to 182 in 1969. This was largely due to the fact that 165 commercial transports in the over 33,000-pound category were exported in 1969 compared with 221 large transports exported in 1968. Airline reequipment programs were nearing completion for the 707/DC-8 type aircraft in 1969 and deliveries of the new generation of wide-bodied jet transports are scheduled for delivery in the early 1970s.

Helicopter exports for 1969 posted a new high of 268 machines at a value of 48.0 million, an increase in units of 22.4 percent over the 219 machines exported for 1968. The $26.5 million value of 1968 helicopter exports was exceeded by 80.6 percent in 1969.

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

Year	Total U. S. Trade Balance	Aerospace			Aerospace Trade Balance as Percent of U. S. Total
		Trade Balance	Exports	Imports	
1960	$5,369	$1,665	$1,726	$ 61	31.0
1961	6,096	1,501	1,653	152	24.6
1962	5,178	1,795	1,923	128	34.7
1963	6,060	1,532	1,627	95	25.3
1964	7,556	1,518	1,608	90	20.1
1965	5,852	1,459	1,618	159	24.9
1966	4,524	1,370	1,673	303	30.3
1967	4,409	1,961	2,248	287	44.4
1968[r]	1,133	2,661	2,994	333	234.9
1969	1,574	2,844	3,151	307	180.7

[r] Revised.

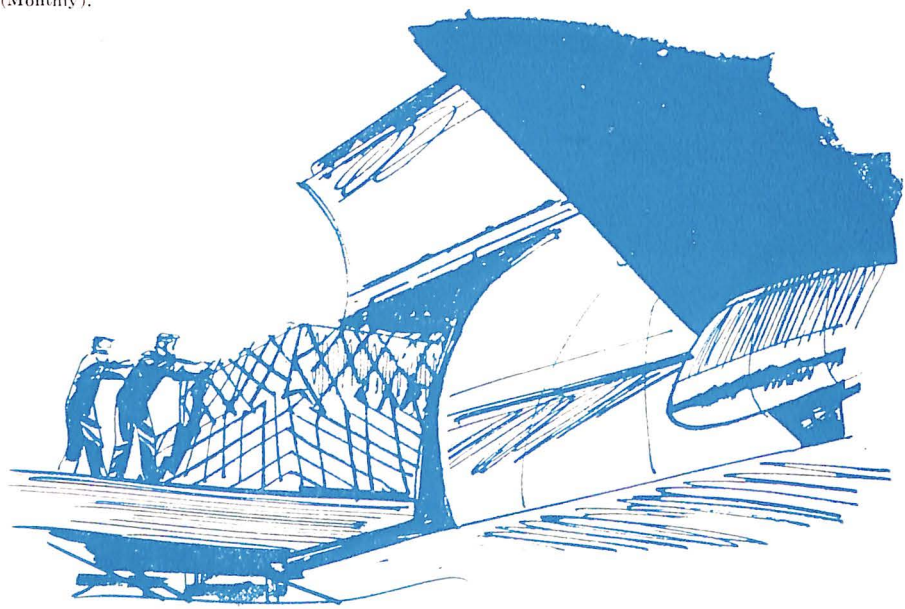
NOTE: U. S. Balance of trade is the difference between exports of domestic merchandise and imports for consumption.

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

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[r]	240	1,200.2	19	9.9	221	1,190.1
1969	182	939.9	17	25.5	165	914.4

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

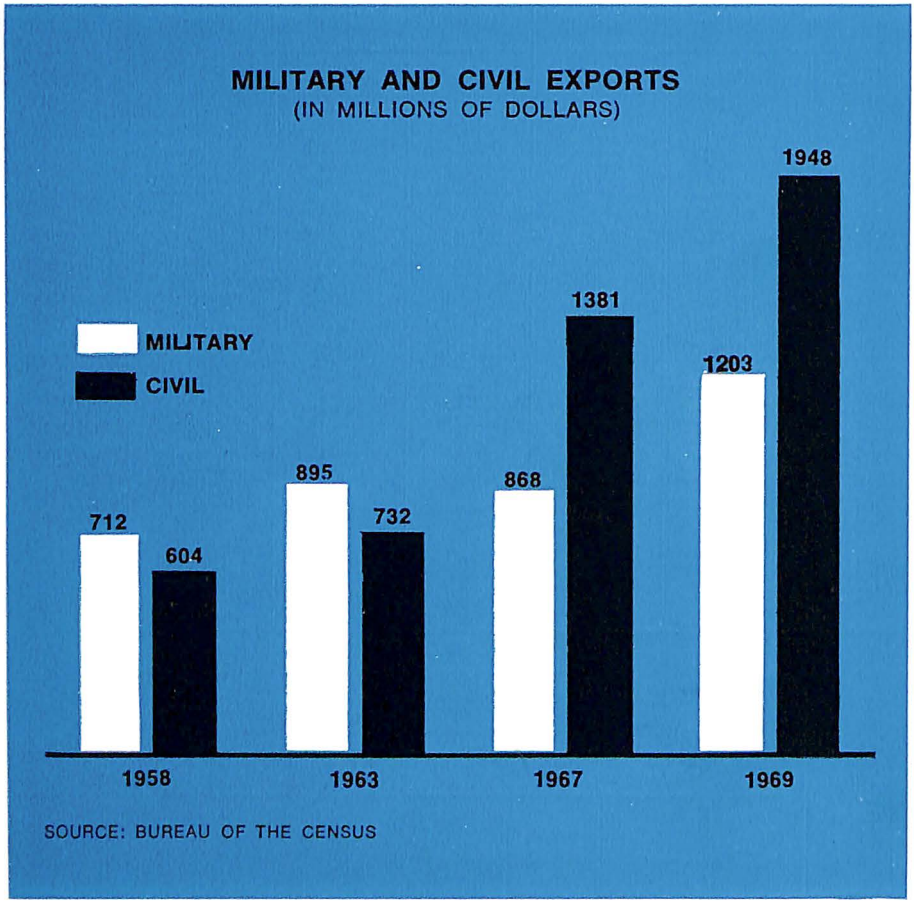


EXPORTS OF GENERAL AVIATION AIRCRAFT
Calendar Years 1948 to Date

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			
					Under 3000 Lbs.		3000 Lbs. & Over	
	Number	Value (Millions)	Number	Value (Millions)	Number	Value (Millions)	Number	Value (Millions)
1965....	2,457	$68.8	2,031	$30.6	184	$ 8.4	242	$29.8
1966....	2,985	89.1	2,387	35.2	261	13.4	337	40.5
1967....	3,125	91.2	2,554	36.9	198	9.5	373	44.8
1968r...	2,890	101.3	2,295	36.1	163	8.5	432	56.7
1969....	2,462	125.6	1,762	35.0	211	11.9	489	78.7

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


MILITARY AND CIVIL EXPORTS
(IN MILLIONS OF DOLLARS)
MILITARY
CIVIL
712
604
895
732
868
1381
1203
1948
1958
1963
1967
1969
SOURCE: BUREAU OF THE CENSUS

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

[a] Manufacturers' Net Billing Price.
NOTE: Data based on exports for Aero Commander, Beech, Cessna, Champion, Lear Jet, Mooney and Piper of new civil aircraft under 20,000 pounds, empty airframe weight.
Source: Aerospace Industries Association, company reports.

EXPORTS OF LIGHT TRANSPORTS AND GENERAL AVIATION AIRCRAFT, BY SELECTED U. S. MANUFACTURERS, BY DESTINATION, CALENDAR YEAR 1969

Total and Destination	Number	Value[a] (Thousands of Dollars)
TOTAL	2,626	$107,766.7
Canada and Greenland	387	11,594.3
Latin America	631	27,092.5
Europe	923	36,842.3
Asia	176	9,480.9
Oceania	138	5,805.4
Africa	371	16,951.3

[a] Manufacturers' Net Billing Price.
NOTE: Data are based on exports for Aero Commander, Beech, Cessna, Lear Jet, Mooney and Piper of new civil aircraft under 20,000 pounds, empty airframe weight.
Source: Aerospace Industries Association, company reports.

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[r]	3,279	115.6	866	92.4	2,413	23.2
1969	4,176	101.8	753	81.4	3,423	20.4

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

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[r]	1,176	7,155
1969	2,324	8,736

[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).

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[r]	379.7	149.0	27.3	121.7	227.4	116.5	110.9	3.3
1969	388.1	129.6	24.3	105.3	250.3	120.5	129.8	8.2

[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).

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

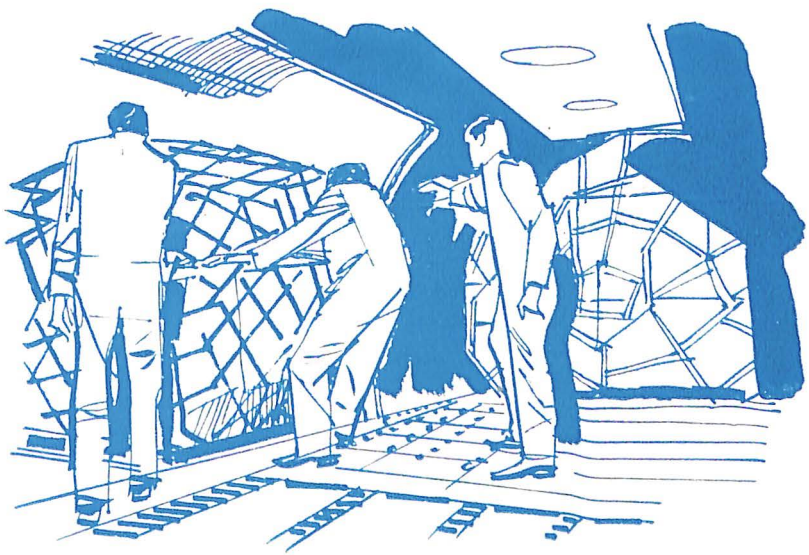
Year Ending Dec. 31	TOTAL		Military		Non-Military	
	Number	Value	Number	Value	Number	Value
1958	595	$35.8	—	—	595	$35.8
1959	632	22.9	171	$ 3.1	461	19.8
1960	634	26.2	70	0.5	564	25.7
1961	618	35.1	124	1.2	494	33.9
1962	511	37.5	129	0.9	382	36.6
1963	423	16.6	67	0.2	356	16.4
1964	589	31.7	201	2.8	288	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	389	143.5	5	5.0	384	138.5

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

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[r]	333,469	110,817	37,913	184,739
1969	307,498	104,374	31,414	171,710

[a] Aircraft includes new and used airplanes, seaplanes, and amphibians.
Source: Bureau of the Census, "U. S. Imports, General and Consumption, Schedule A Commodity and Country", Reports FT 110, 125, 135 (Monthly).



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	—
TOTAL[a]	18,508	16,451	2,057

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

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

NOTE: Data based on exports for Bell, Fairchild-Hiller, Hughes Tool, 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 1969

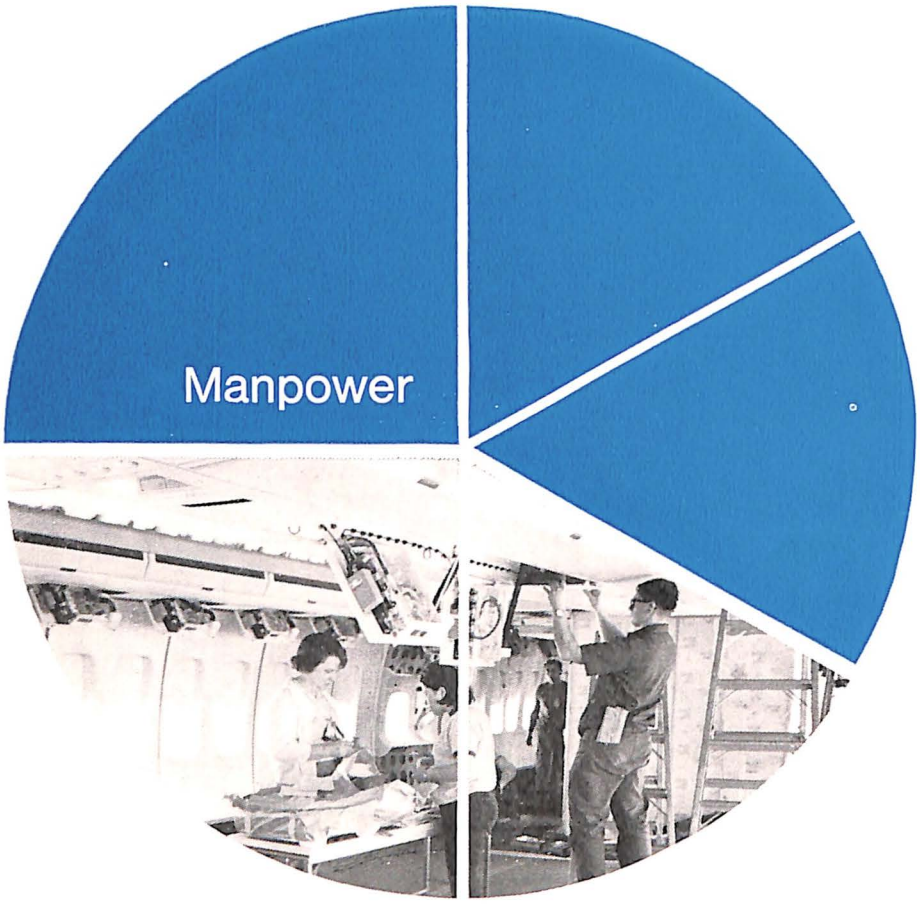
Total and Destination	Number	Value[a] (Thousands of Dollars)
TOTAL	268	$48,047.3
Canada and Greenland	45	5,077.8
Latin America	78	13,644.0
Europe	44	6,747.5
Asia	76	10,421.5
Oceania	15	1,277.2
Africa	3	145.9
Country not specified	7	10,733.4

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

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 (6 mos)	282.8	282.2	0.6	262.4	262.4	—	20.4	19.8	0.6

[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.



The aerospace industry continued to be the nation's largest manufacturing employer in 1969, but total employment in the industry declined to a monthly average of 1,354,000. This was a 64,000 decrease from the record-high employment of 1,418,000 in 1968.

Aircraft manufacturers, including engine producers, recorded a 33,000 employment decrease from 630,000 in 1968 to 597,000 in 1969. Missile and space manufacturers, including producers of communications equipment, registered a 1969 total employment of 582,000 down 28,000 from the 610,000 employed in the previous year. There were 175,000 employed in associated production throughout the industry in 1969, a 3,000 decrease from 1968.

As a result of further budget reductions in the space program, the number of aerospace industry employees working on contracts for the National Aeronautics and Space Administration continued to decline. The

1969 total employment reflected a 48,800 reduction from the 235,400 reported for 1968. Further reductions are projected for 1970 and 1971.

Industry employment of scientists and engineers continued to increase in 1969 to a total of 386,100. This was an increase of 9,400 over 376,700 for 1968. Aircraft and missile employment in this category reached 101,000 in 1969 compared with 97,800 the year before.

Average weekly earnings in the aerospace industry, including overtime, rose to $161.77 compared to $152.04 in 1968.

Of the five largest areas of aerospace employment, the Pacific region ranked first with 406,301; New England was second with 111,937; West South Central third with 95,907; Middle Atlantic fourth with 95,766; and East North Central fifth with 89,980.

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	
	Accessions	Separations	Accessions	Separations	Accessions	Separations	Accessions	Separations	Accessions	Separations
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

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

ESTIMATED AEROSPACE EMPLOYMENT, TOTAL AND PRODUCTION WORKERS
Calendar Years 1959 to Date

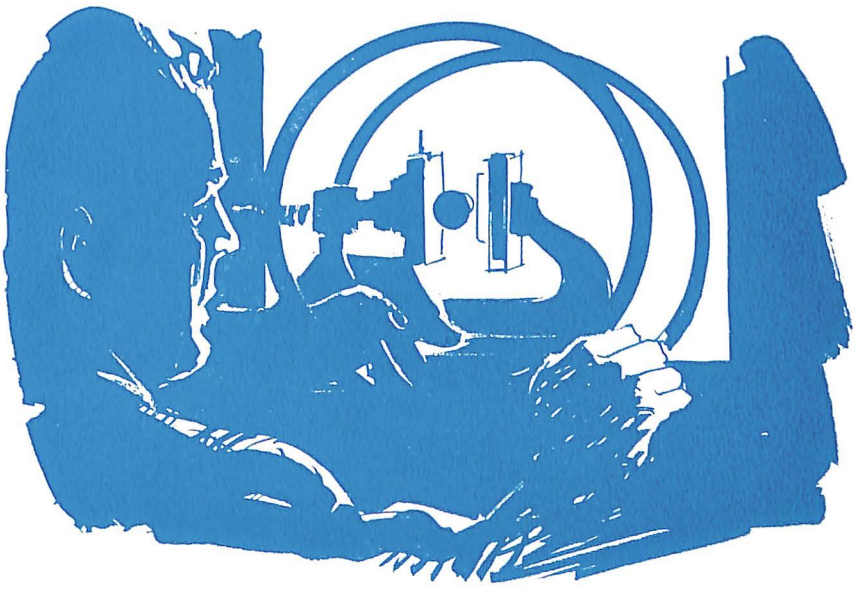
Monthly Average for the Year	TOTAL AEROSPACE	AIRCRAFT[a]		MISSILES AND SPACE[b]		OTHER[d]
		TOTAL (Including Propulsion)	Propulsion	TOTAL Missiles and Space	Communications Equipment[c]	
TOTAL EMPLOYMENT (Thousands)						
1959	1,128	707	128	342	106	79
1960	1,074	638	124	356	118	80
1961	1,096	557	121	421	165	118
1962	1,177	458	116	562	174	157
1963	1,174	446	116	578	185	150
1964	1,117	434	109	535	166	148
1965	1,133	458	105	505	188	170
1966	1,298	560	118	566	206	172
1967	1,392	610	122	602	224	180
1968	1,418	630	117	610	232	178
1969	1,354	597	109	582	231	175
PRODUCTION WORKERS (Thousands)						
1959	673	443	73	183	49	47
1960	607	370	68	191	53	46
1961	587	317	67	215	80	65
1962	619	269	66	273	85	77
1963	580	244	62	260	83	76
1964	552	243	58	236	72	73
1965	571	262	57	223	80	86
1966	686	332	68	263	92	91
1967	747	367	71	284	98	96
1968	754	374	67	287	102	93
1969	697	343	61	265	98	89

[a] "Aircraft" includes employees in the aircraft industry (SIC 372) engaged in aircraft, aircraft engine, propellers, or parts production.
[b] "Missiles and Space" includes employees in the aircraft, complete missile and space, and electronic industries engaged in missile and space work.
[c] "Communications equipment" includes employees in the electrical machinery industry (SIC 36) engaged in missile and space work.
[d] "Other" includes employees in industry classifications (SIC 28, 35, 38, 73, 89 and others) engaged in missile and space work.
Sources: Bureau of Labor Statistics "Employment and Earnings", Bureau of Employment Security "Missiles, Spacecraft and Aircraft", AIA estimates.

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

As of January	TOTAL Scientists and Engineers	Aircraft and Missiles Scientists and Engineers	Aerospace as a Per Cent of Total
1957	229,400	58,700	25.6
1958	243,800	58,600	24.0
1959	268,400	65,900	24.6
1960	292,000	72,400	24.8
1961	312,100	78,500	25.2
1962	312,000	79,400	25.4
1963	327,300	90,700	27.7
1964	340,200	99,400	29.2
1965	343,600	97,400	28.3
1966	353,200	97,200	27.5
1967	367,200	98,800	26.8
1968[r]	376,700	97,800	26.0
1969	386,100	101,000	26.2

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



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	210.0	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	318.7	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				
Mar.	738.5	434.9	184.3	118.8

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 198,700 employees in the aircraft and parts industry worked on missiles and spacecraft in December, 1969.
Source: Bureau of Labor Statistics, "Employment and Earnings." (Monthly).

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	38.4	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				
Mar.	413.1	236.0	100.4	76.7

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 113,000 production workers in the aircraft and parts industry worked on missiles and spacecraft in December, 1969.
Source: Bureau of Labor Statistics, "Employment and Earnings." (Monthly).

AVERAGE HOURLY EARNINGS IN AIRCRAFT AND PARTS PLANTS
1939 to Date
(Includes Overtime Premiums)

Monthly Average for the Year	TOTAL	Aircraft (Airframes)	Aircraft Engines and Parts	Other Aircraft Parts and Equipment
1939	N.A.	N.A.	$0.812	N.A.
1940	N.A.	N.A.	0.816	N.A.
1941	N.A.	N.A.	1.008	N.A.
1942	N.A.	N.A.	1.189	N.A.
1943	N.A.	N.A.	1.236	N.A.
1944	N.A.	N.A.	1.287	N.A.
1945	N.A.	N.A.	1.286	N.A.
1946	N.A.	N.A.	1.316	N.A.
1947	$1.372	$1.360	1.384	N.A.
1948	1.487	1.465	1.519	N.A.
1949	1.560	1.548	1.571	N.A.
1950	1.637	1.622	1.662	N.A.
1951	1.78	1.75	1.85	N.A.
1952	1.89	1.87	1.94	N.A.
1953	1.99	1.98	1.99	N.A.
1954	2.07	2.08	2.05	N.A.
1955	2.16	2.17	2.13	N.A.
1956	2.27	2.27	2.24	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	2.15	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				
Mar.	4.05	4.09	4.02	3.97

NOTE: The production workers surveyed include substantial missile and spacecraft employment. See NOTE page 85.
N.A.—Not available.
Source: Bureau of Labor Statistics, "Employment and Earnings," (Monthly).

AVERAGE WEEKLY EARNINGS IN AIRCRAFT AND PARTS PLANTS
1939 to Date
(Includes Overtime Premiums)

Monthly Average for the Year	TOTAL	Aircraft (Airframes)	Aircraft Engines and Parts	Other Aircraft Parts and Equipment
1939	N.A.	N.A.	$ 36.05	N.A.
1940	N.A.	N.A.	37.62	N.A.
1941	N.A.	N.A.	47.78	N.A.
1942	N.A.	N.A.	58.38	N.A.
1943	N.A.	N.A.	59.33	N.A.
1944	N.A.	N.A.	60.75	N.A.
1945	N.A.	N.A.	57.48	N.A.
1946	N.A.	N.A.	54.22	N.A.
1947	$ 54.74	$ 54.13	54.67	N.A.
1948	60.97	60.36	61.52	N.A.
1949	63.34	62.85	63.31	N.A.
1950	68.10	67.15	69.31	N.A.
1951	77.96	75.95	80.07	N.A.
1952	81.27	79.85	84.20	N.A.
1953	83.38	81.99	84.77	N.A.
1954	84.66	85.28	82.62	N.A.
1955	89.21	89.84	86.48	N.A.
1956	95.57	95.11	94.30	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				
Mar.	166.05	166.87	161.60	168.73

NOTE: The production workers surveyed include substantial missile and spacecraft employment. See NOTE page 85.
N.A.—Not available.
Source: Bureau of Labor Statistics, "Employment and Earnings," (Monthly).

AVERAGE EMPLOYMENT IN THE AIRCRAFT AND PARTS AND THE COMPLETE MISSILES AND SPACE VEHICLES INDUSTRY, BY GEOGRAPHIC DIVISION AND SELECTED STATES, 1964 TO DATE[a]

Geographical Divisions and Selected States	1964	1965	1966	1967	1968
TOTAL[b]	773,836	784,714	926,885	1,004,333	1,014,882
New England	86,242	88,067	100,998	110,979	111,937
Massachusetts	20,217	16,882	17,682	20,293	21,709
Connecticut	65,117	69,437	80,961	87,900	87,788
Me., N.H., Vt., R.I.	908	1,748	2,355	2,786	2,440
Middle Atlantic	74,237	74,863	88,521	94,298	95,766
New York	46,247	46,312	54,620	58,773	59,655
New Jersey	10,557	11,240	11,279	11,052	11,220
Pennsylvania	17,433	17,311	22,622	24,473	24,891
East North Central	69,423	72,718	85,800	88,455	89,980
Ohio	40,216	39,998	49,074	46,798	49,015
Indiana	20,209	20,639	22,684	24,208	24,833
Illinois	3,916	5,358	6,251	7,571	7,662
Mich., Wisc.	5,082	6,723	7,791	9,878	8,470
West North Central	70,555	69,836	86,750	91,873	83,112
Missouri	36,874	37,367	44,937	46,756	41,809
Kansas	32,644	31,113	40,037	42,983	38,463
Minn., Iowa, N.D., S.D., Neb.	1,037	1,356	1,776	2,134	2,840
South Atlantic	66,262	66,709	77,106	86,432	84,197
Maryland	16,978	14,500	18,076	19,330	16,476
Del., D.C., Va., W.Va., N.C., S.C.	3,127	3,687	4,362	5,626	5,724
Georgia	18,482	20,624	23,490	25,587	25,075
Florida	27,675	27,898	31,178	35,889	36,822
East South Central	9,919	14,517	19,822	19,550	19,099
Alabama	8,963	13,335	13,693	12,226	12,125
Tennessee	956	1,182	4,343	5,106	4,952
Ky., Miss.			1,786	2,218	2,022
West South Central	55,303	59,684	69,114	79,941	95,907
Texas	37,385	37,690	46,394	57,947	74,299
Ark., La.	17,918	10,676	9,848	8,529	7,371
Oklahoma		11,318	12,872	13,465	14,237
Mountain	20,580	27,029	27,072	29,258	28,317
Arizona	7,308	7,574	9,228	11,388	11,501
Utah	9,495	8,232	7,532	6,729	6,674
Mont., Idaho, Wyo., Colo., N.Mex., Nev.	3,777	10,605	10,312	11,141	10,142
Pacific	320,516	311,206	371,225	403,339	406,301
California	266,662	253,066	284,281	302,696	299,717
Washington	52,690	56,944	85,415	98,740	104,485
Ore., Alaska, Hawaii	1,164	1,196	1,529	1,903	2,099

[a] These figures are a combination of the average annual employment in the aircraft and parts industry (SIC 372) and the average employment during the first three months of each year in the complete missiles and space vehicles industry (SIC 1925). The difference between these totals and employment totals elsewhere in this book are due to technical differences and do not seriously affect the usability of the data.

[b] Includes Puerto Rico.

Source: Department of Labor, Manpower Administration.

THE ELEVEN LARGEST AEROSPACE LABOR MARKET AREAS[a]
As of November 1969

	Aerospace Employment (Thousands)	Percent of Total U.S. Employment of Aerospace
TOTAL, U. S.	1,307.0	100.0
TOTAL, ELEVEN LARGEST AREAS[a]	560.1	42.8
Los Angeles, Calif.	140.8	10.8
San Jose, Calif.	71.5	5.5
Hartford, Conn.	47.2	3.6
Fort Worth, Tex.	41.4	3.2
New York, New York	36.6	2.8
San Diego, Calif.	32.0	2.4
Wichita, Kans.	27.2	2.1
Anaheim-Santa Ana-Garden Grove, Calif.	15.6	1.2

[a] Includes areas with aerospace employment of 15,000 or more. To avoid disclosure, three large labor market areas are excluded in the details above. They are (1) Seattle, Washington, (2) St. Louis, Missouri, and (3) Atlanta, Georgia, with 147,758 employees.

Sources: Department of Labor, Manpower Administration; Aerospace Industries Association.

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

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.

EMPLOYMENT ON NATIONAL AERONAUTICS AND SPACE ADMINISTRATION PROGRAMS
1960 to Date

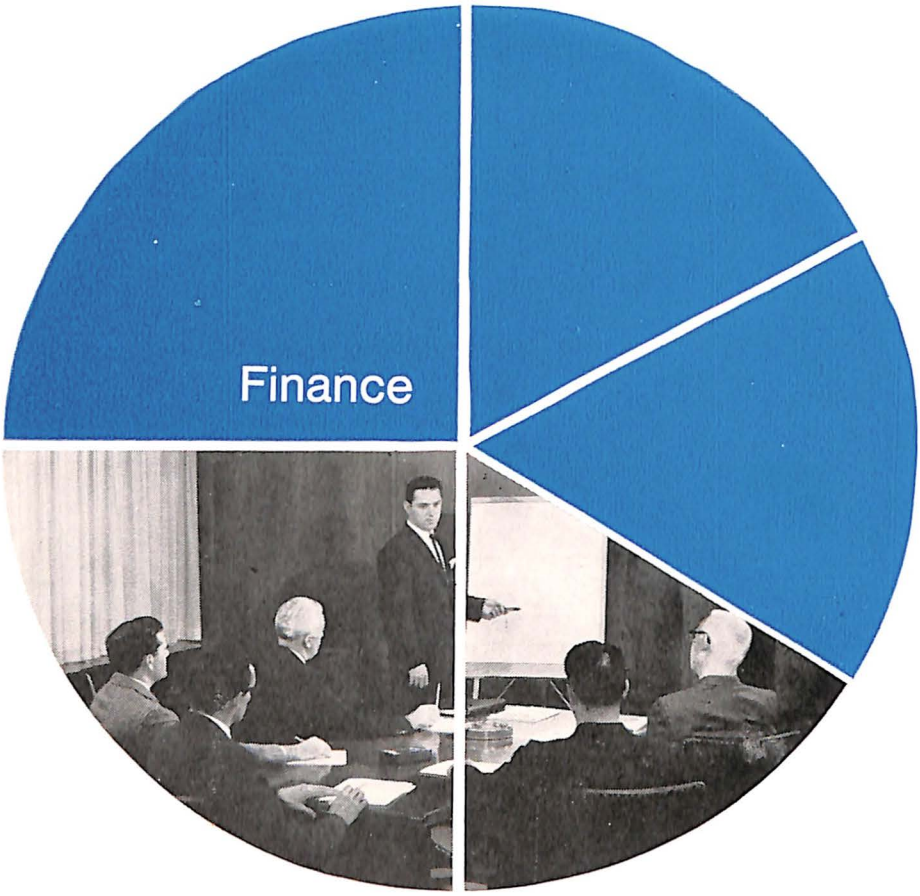
June	NASA Employees	Contractor Employees	TOTAL EMPLOYMENT
1960	10,268	36,500	46,786
1961	17,077	57,500	74,577
1962	22,156	115,500	137,656
1963	27,904	218,400	246,304
1964	31,984	347,100	379,084
1965	33,200	376,700	409,900
1966	33,924	360,000	393,924
1967	33,726	273,200	306,926
1968	32,471	235,400	267,871
1969	31,745	186,600	218,345
1970	31,350	135,550	166,900
1971[E]	30,550	113,350	143,900

[E] Estimate.
Source: National Aeronautics and Space Administration, "Background Material and NASA FY 1971 Budget Briefing"

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

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



A decline in sales was reported by 65 companies classified as aerospace firms by the Securities & Exchange Commission. The reported total 1969 sales (including non-aerospace sales) of $26.4 billion was down from $26.9 billion in 1968. (These sales figures differ from those reported in preceding pages because of the size of the industry group which filed with the SEC).

The net profit of these 65 companies after taxes totaled $804 million compared with $857 million in 1968. Net profit retained in business also decreased from $552 million in 1968 to $467 million in 1969. The ratio of profits on sales declined from 3.2 percent in 1968 to 3.0 percent in 1969. This is substantially lower than the 4.8 percent average for all manufacturing.

The value of industry stockholders' equity increased 21 percent from $6,037 million in 1968 to $7,312 million in 1969. Net working capital

was increased from $3,768 million to $4,531 million, up 20 percent from the previous years.

Federal income tax payments by aerospace companies in 1969 amounted to 43.9 percent of the industry's total net income. This reflected a 16 percent decrease from $749 million in 1968 to $629 million in 1969.

The total assets of aerospace companies increased from $18,332 million in 1968 to $22,678 million in 1969. Short-term debt was increased from $789 million to $1,132 million, and long-term debt moved up from $2,668 million to $3,618 million.

Aerospace industry plans for new plant and equipment in 1970 call for anticipated expenditures of $720 million, down $110 million from the $830 million capital spending for 1969.

COMPOSITION OF CURRENT ASSETS, 1956 TO DATE, AEROSPACE COMPANIES
(in Percent of Total)

Year	Total Current Assets	Cash and Securities	Inventories	Receivables	Miscellaneous
1956	100.0	9.7	64.1	25.3	0.9
1957	100.0	8.7	62.8	27.2	1.3
1958	100.0	9.7	60.2	28.8	1.3
1959	100.0	8.0	60.8	29.3	1.9
1960	100.0	8.2	60.2	30.2	1.4
1961	100.0	8.0	58.2	32.0	1.8
1962	100.0	7.2	58.4	32.3	1.2
1963	100.0	7.4	61.2	28.7	2.7
1964	100.0	7.8	62.0	27.1	3.1
1965	100.0	7.1	61.0	26.9	5.0
1966	100.0	5.0	66.2	25.1	3.7
1967	100.0	4.4	70.4	22.3	2.9
1968	100.0	4.7	70.6	21.7	3.0
1969	100.0	5.9	70.5	20.9	2.7

NOTE: Includes 65 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."

BALANCE SHEET COMPARISONS, AEROSPACE COMPANIES
1964 to Date
(Millions of Dollars)

	1964	1965	1966	1967	1968	1969
Assets:						
Current Assets						
Cash	$ 415	$ 395	$ 369	$ 460	$ 576	$ 763
U.S. Government Securities	74	75	46	16	37	170
Total Cash and U.S. Govt. Securities	$ 489	$ 470	$ 415	$ 476	$ 613	$ 933
Receivables (total)	1,695	1,788	2,066	2,387	2,840	3,318
Inventories (gross)	3,876	4,048	5,453	7,550	9,267	11,179
Other current assets	193	331	302	314	396	435
Total Current Assets	$6,253	$6,637	$ 8,236	$10,727	$13,116	$15,865
Total Net Plant	1,591	1,670	2,148	2,849	3,542	4,496
Other Non-Current Assets	341	402	684	1,128	1,674	2,317
Total Assets	$8,185	$8,709	$11,068	$14,704	$18,332	$22,678
Liabilities:						
Current Liabilities						
Short term loans	388	339	670	1,055	789	1,132
Advances by U.S. Govt.	1,725	1,868	2,446	3,578	4,317	5,135
Trade accounts and notes payable	928	835	1,098	1,391	1,922	2,303
Federal income taxes accrued	239	252	256	229	304	365
Installments due on long term debt	38	45	61	88	110	186
Other current liabilities	770	1,043	1,369	1,558	1,906	2,213
Total current liabilities	$4,088	$4,382	$ 5,900	$ 7,899	$ 9,348	$11,334
Long Term Debt	816	807	1,094	1,897	2,668	3,618
Other Non-Current Liabilities	47	67	100	186	279	412
Total Liabilities	$4,951	$5,256	$ 7,094	$ 9,982	$12,295	$15,364
Stockholders' Equity:						
Capital Stock	1,339	1,312	1,488	1,785	2,254	2,505
Earned Surplus and Reserves	1,895	2,142	2,486	2,937	3,783	4,807
Total Net Worth	$3,234	$3,454	$ 3,974	$ 4,722	$ 6,037	$ 7,312
Total Liabilities and Stockholder's Equity	$8,185	$8,709	$11,068	$14,704	$18,332	$22,678
Net Working Capital	$2,166	$2,256	$ 2,336	$2,828	$ 3,768	$ 4,531

NOTE: Includes 65 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."

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

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
Net Sales	$15,313	$15,403	$16,073	$19,224	$22,739	$26,852	$26,392
Net Profit from Operations	695	756	997	1,076	1,152	1,661	1,493
Total Income before Federal Income Taxes	665	748	984	1,046	1,099	1,606	1,433
Provision for Federal Income Taxes	316	351	460	473	489	749	629
Net Profit after Taxes	350	395	524	572	610	857	804
Net Profit Retained in Business	214	241	339	380	382	552	467

NOTE: Does not include data for companies which produce aerospace products but are classified in industries other than industry group 372. Includes 65 companies.
Source: Securities & Exchange Commission—Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations."

MAJOR DEFENSE CONTRACTORS
(Listed by rank according to net value of military prime contracts awarded July 1, 1968-June 30, 1969
(Millions of Dollars)

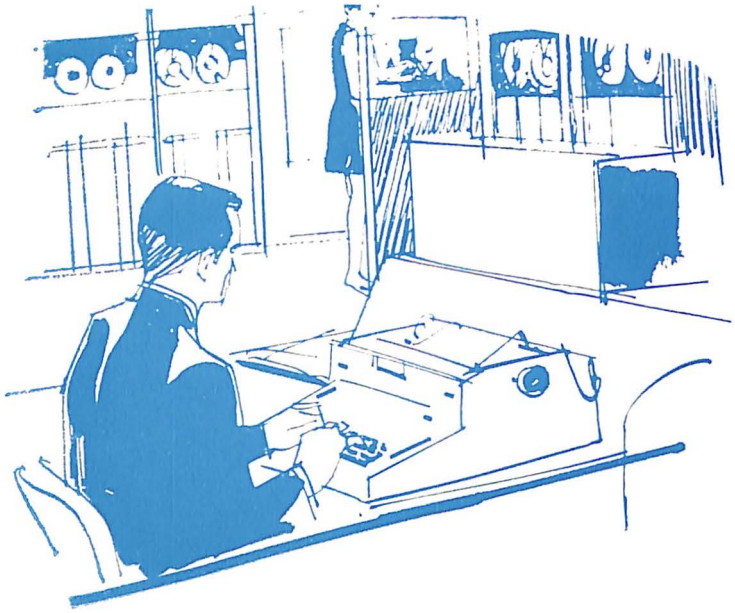
Company	July 1, 1964 to June 30, 1965	July 1, 1965 to June 30, 1966	July 1, 1966 to June 30, 1967	July 1, 1967 to June 30, 1968	July 1, 1968 to June 30, 1969
U. S. TOTAL ALL CONTRACTS	$24,177.8	$33,532.6	$39,219.4	$38,826.6	$25,175.2
Lockheed	1,715.0	1,531.0	1,807.2	1,870.2	2,040.2
General Electric	824.3	1,187.0	1,289.8	1,488.7	1,620.8
General Dynamics	1,178.6	1,136.0	1,831.0	2,239.3	1,243.1
McDonnell Douglas[a]	1,025.9	1,001.0	2,124.6	1,110.8	1,069.7
United Aircraft	632.1	1,138.7	1,097.1	1,321.0	997.4
American Telephone & Telegraph	587.6	672.1	637.0	775.9	914.6
Ling-Temco-Vought	264.7	310.8	534.7	758.3	914.1
North American Rockwell[b]	745.8	520.4	688.8	668.6	674.2
Boeing	583.3	914.5	911.7	762.1	653.6
General Motors	254.4	508.0	625.1	629.6	584.4
Raytheon	293.4	268.5	403.3	451.8	546.8
Sperry Rand	318.4	426.8	484.1	447.2	467.9
Avco	234.2	506.0	419.5	583.6	456.1
Hughes	278.3	336.6	419.5	286.1	439.0
Westinghouse Electric	260.9	348.7	453.1	251.0	429.6
Textron	195.7	554.8	496.4	500.7	428.3
Grumman	353.4	322.9	487.7	629.2	417.1
Honeywell	82.5	250.6	313.7	351.7	405.6
Ford (includes Philco)	312.0	247.9	403.8	381.4	396.3
Radio Corp. of America	213.9	242.4	268.4	255.0	299.0
Martin Marietta	315.6	337.8	290.2	393.5	264.3
General Tire & Rubber	302.0	327.3	273.1	248.1	263.5
International Business Machines	186.2	181.6	194.9	223.7	256.6
International Telephone & Telegraph	206.7	219.8	255.2	241.6	238.3
Bendix	234.9	281.8	296.1	223.6	184.4
Northrop	255.9	276.0	306.4	310.3	178.9
TRW	79.6	103.6	120.5	127.5	170.4
Fairchild Hiller	70.1	80.1	93.7	121.3	148.6
Thiokol	136.2	110.7	172.7	119.4	128.1
Curtiss Wright	49.3	91.1	90.8	75.4	91.2

[a] Combined data for McDonnell and Douglas for earlier years.
[b] North American only before FY 1968.
Source: Department of Defense, "100 Companies and their Subsidiary Corporations Listed According to Net Value of Military Prime Contract Awards". (Annually)

MAJOR NATIONAL AERONAUTICS AND SPACE ADMINISTRATION CONTRACTORS
(Listed by rank according to net value of NASA prime contracts awarded July 1, 1968-June 30, 1969)
(Millions of Dollars)

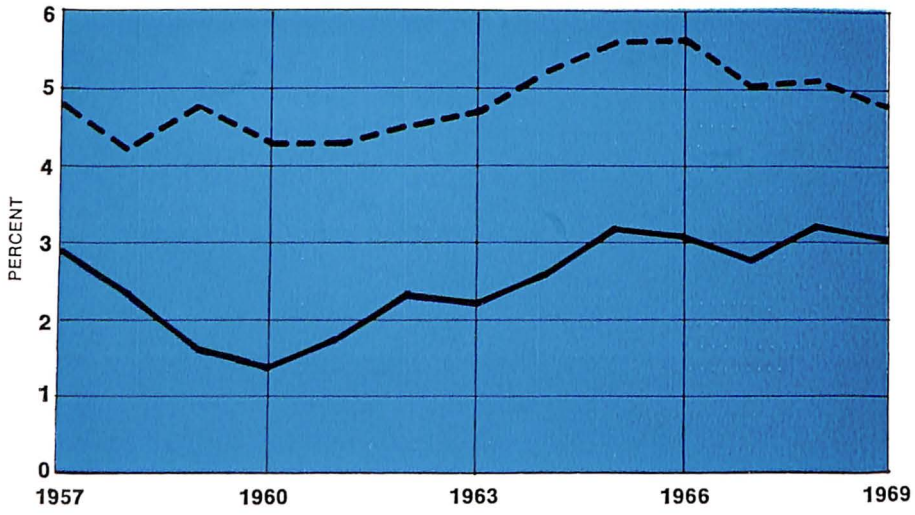
Company	July 1, 1964 to June 30, 1965	July 1, 1965 to June 30, 1966	July 1, 1966 to June 30, 1967	July 1, 1967 to June 30, 1968	July 1, 1968 to June 30, 1969
U. S. TOTAL ALL CONTRACTS	$4,141.4	$4,087.7	$3,864.1	$3,446.7	$3,022.3
North American Rockwell[a]	1,099.4	1,128.9	983.8	838.7	680.9
Grumman	267.2	381.2	481.1	394.1	369.2
Boeing	306.0	313.7	273.5	296.7	228.7
McDonnell Douglas[b]	418.4	312.0	243.9	209.0	207.5
General Electric	181.5	235.7	179.3	190.7	150.1
Bendix	66.1	78.0	120.0	123.8	127.6
International Business Machines	128.3	108.2	186.4	147.7	112.5
Aerojet General	[d]	100.5	95.7	67.1	64.9
Martin Marietta	8.4	5.7	12.8	26.8	56.0
Radio Corp. of America	106.6	51.3	57.5	63.2	51.6
TRW	50.5	49.9	52.6	52.4	50.0
Chrysler	86.0	83.5	76.6	62.6	42.5
Lockheed	35.8	44.5	42.0	40.5	39.8
Sperry Rand	39.4	29.5	39.7	31.8	34.1
General Dynamics	111.1	92.1	61.0	54.4	34.0
General Motors	72.5	123.3	65.2	46.8	30.9
Federal Electric Corp.	[d]	[d]	[d]	12.3	27.0
United Aircraft	43.3	40.7	40.0	18.1	26.2
Service Technology Corp.	[d]	[d]	[d]	[d]	26.2
Philco-Ford	30.0	25.4	32.1	32.0	22.4
Catalytic/Dow	[d]	[d]	[d]	[d]	19.4
LTV Aerospace	15.1	28.8	46.3	42.7	18.3
Brown/Northrop	4.0	[d]	10.0	14.5	12.7
Northrop	7.3	9.7	8.8	15.4	12.4
ILC Industries, Inc.	[d]	[d]	6.3	8.1	12.2
Brown Engineering	30.9	24.3	16.7	16.3	11.1
Bellcomm	9.8	9.7	9.3	10.0	10.1
Singer-General Precision[c]	[d]	4.1	25.0	12.4	9.7
Union Carbide	20.0	19.7	12.6	15.3	8.9
Garrett	7.2	7.0	9.3	10.7	8.9
Honeywell	27.1	22.2	22.6	15.7	8.1

[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).



NET PROFITS

(AFTER TAXES AS A PERCENTAGE OF SALES)



SOURCE: SECURITIES AND EXCHANGE COMMISSION
FEDERAL TRADE COMMISSION

MILITARY PRIME CONTRACT AWARDS AND PERCENT OF U. S. TOTAL, BY REGION AND STATE[a]
Fiscal Years 1967–1969

Region and State	Million Dollars			Percent of U. S. Total		
	FY 1967	FY 1968	FY 1969	FY 1967	FY 1968	FY 1969
U.S. TOTAL	$37,382	$37,248	$35,249	100.0	100.0	100.0
New England	3,875	4,436	3,625	10.4	11.9	10.3
Connecticut	1,936	2,355	1,715	5.2	6.3	4.9
Maine	57	75	53	0.2	0.2	0.2
Massachusetts	1,422	1,619	1,550	3.8	4.3	4.4
New Hampshire	162	156	102	0.4	0.4	0.3
Rhode Island	198	126	119	0.5	0.3	0.3
Vermont	100	105	86	0.3	0.3	0.2
Middle Atlantic	6,146	6,320	6,045	16.4	17.0	17.2
New Jersey	1,235	1,109	1,271	3.3	3.0	3.6
New York	3,262	3,484	3,074	8.7	9.4	8.7
Pennsylvania	1,649	1,727	1,700	4.4	4.6	4.8
East North Central	4,982	4,883	4,601	13.3	13.1	13.1
Illinois	1,064	932	932	2.8	2.5	2.6
Indiana	898	1,108	1,059	2.4	3.0	3.0
Michigan	1,034	796	683	2.8	2.1	1.9
Ohio	1,602	1,641	1,533	4.3	4.4	4.3
Wisconsin	384	406	394	1.0	1.1	1.1
West North Central	3,736	2,753	2,529	10.0	7.4	7.2
Iowa	279	261	202	0.7	0.7	0.6
Kansas	399	292	350	1.1	0.8	1.0
Minnesota	651	620	741	1.7	1.7	2.1
Missouri	2,278	1,357	1,095	6.1	3.6	3.1
Nebraska	103	121	102	0.3	0.3	0.3
North Dakota	17	68	36	[b]	0.2	0.1
South Dakota	9	34	3	[b]	0.1	[b]
South Atlantic	4,661	4,481	4,462	12.5	12.0	12.7
Delaware	52	43	47	0.1	0.1	0.1
District of Columbia	358	350	321	1.0	0.9	0.9
Florida	799	976	965	2.1	2.6	2.7
Georgia	1,148	964	933	3.1	2.6	2.6
Maryland	868	703	731	2.3	1.9	2.1
North Carolina	448	487	515	1.2	1.3	1.5

MILITARY PRIME CONTRACT AWARDS AND PERCENT OF U. S. TOTAL, BY REGION AND STATE[a]—*Continued*
Fiscal Years 1967–1969

Region and State	Million Dollars			Percent of U. S. Total		
	FY 1967	FY 1968	FY 1969	FY 1967	FY 1968	FY 1969
South Carolina	181	133	172	0.5	0.4	0.5
Virginia	665	693	711	1.8	1.9	2.0
West Virginia	142	132	67	0.4	0.4	0.2
South Central	5,562	6,214	5,377	14.5	16.7	15.3
Alabama	297	409	408	0.8	1.1	1.2
Arkansas	127	121	117	0.3	0.3	0.3
Kentucky	124	60	60	0.3	0.2	0.2
Louisiana	656	461	390	1.8	1.2	1.1
Mississippi	115	369	218	0.3	1.0	0.6
Oklahoma	158	165	173	0.4	0.4	0.5
Tennessee	538	542	486	1.4	1.5	1.4
Texas	3,547	4,087	3,525	9.5	11.0	10.0
Mountain	875	838	919	2.3	2.3	2.6
Arizona	250	287	344	0.7	0.8	1.0
Colorado	210	263	243	0.6	0.7	0.7
Idaho	15	17	16	[b]	[b]	[b]
Montana	78	20	22	0.2	0.1	0.1
Nevada	29	18	27	0.1	[b]	0.1
New Mexico	81	87	96	0.2	0.2	0.3
Utah	179	131	157	0.5	0.4	0.4
Wyoming	33	15	13	0.1	[b]	[b]
Pacific	7,394	7,121	7,485	19.8	19.1	21.2
California	6,689	6,472	6,824	17.9	17.4	19.4
Oregon	99	120	86	0.3	0.3	0.2
Washington	606	529	575	1.6	1.4	1.6
Alaska and Hawaii	151	202	206	0.4	0.5	0.6
Alaska	86	106	91	0.2	0.3	0.3
Hawaii	65	96	115	0.2	0.2	0.3

[a] Excludes the dollar value for work to be performed in classified locations and contracts and purchases under $10,000 amounting to about $4 billion per year.
[b] Less than 0.05%.
Source: Department of Defense, Office of the Secretary of Defense, Directorate of Statistical Services, "Military Prime Contract Awards by Region and State, Fiscal Years 1967, 1968, 1969".

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	0.83
1970[a]	83.58	34.80	17.61	0.72

[a] Plans according to a survey conducted in January and February 1970.
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 70-10, SEC 2426, March 11, 1970.

MILITARY PRIME CONTRACT AWARDS OF $10,000 OR MORE FOR SELECTED MAJOR MILITARY HARD GOODS, BY GEOGRAPHIC REGION
Fiscal Years 1967–1969

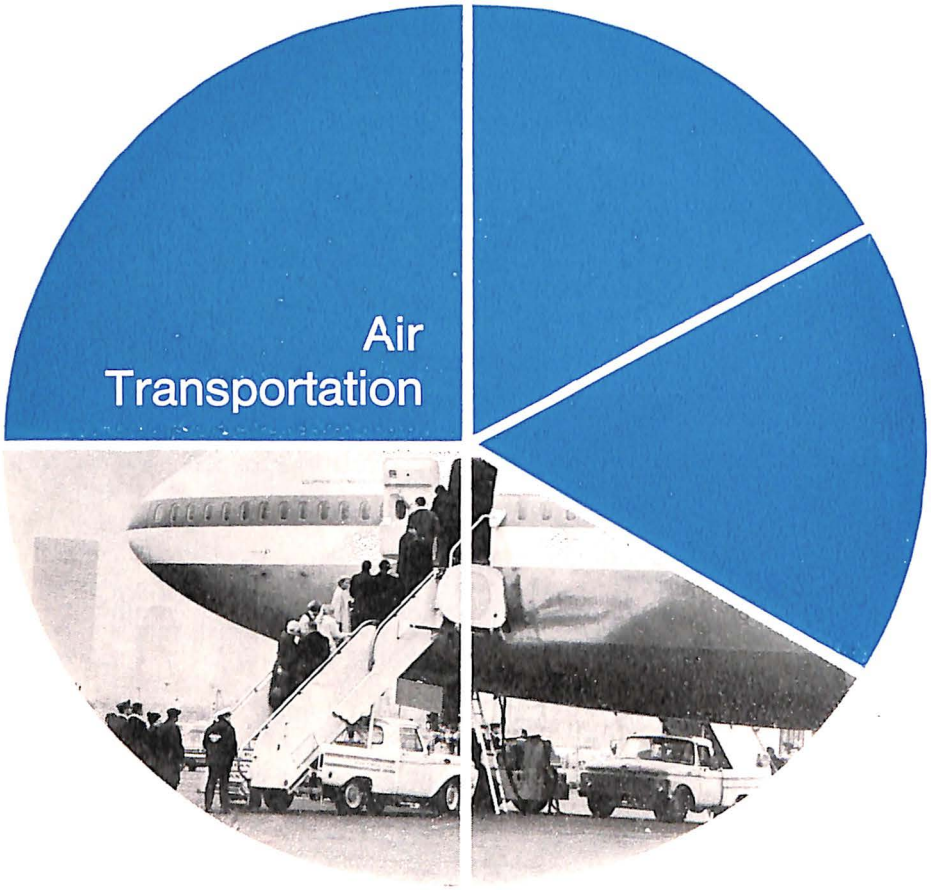
Program and Region	Million Dollars			Percent of Program Total		
	FY 1967	FY 1968	FY 1969	FY 1967	FY 1968	FY 1969
AIRCRAFT	$10,087	$9,644	$8,335	100.0	100.0	100.0
New England	1,532	1,791	1,308	15.2	18.6	15.7
Middle Atlantic	1,273	1,266	927	12.6	13.1	11.1
East North Central	1,071	1,080	1,154	10.6	11.2	13.8
West North Central	1,918	876	746	19.0	9.1	9.0
South Atlantic	1,068	980	1,070	10.6	10.2	12.8
South Central	2,124	2,577	2,083	21.1	26.7	25.0
Mountain	93	74	58	0.9	0.8	0.7
Pacific	1,008	999	988	10.4	10.4	11.9
Alaska and Hawaii	1	1	1	[a]	[a]	[a]
MISSILE AND SPACE SYSTEMS	$1,564	$4,945	$5,474	100.0	100.0	100.0
New England	463	577	702	10.2	11.7	12.8
Middle Atlantic	467	548	754	10.2	11.1	13.8
East North Central	208	200	128	4.6	4.0	2.3
West North Central	114	151	121	2.5	3.0	2.2
South Atlantic	441	516	499	9.7	10.4	9.1
South Central	145	143	125	3.2	2.9	2.3
Mountain	314	261	317	6.9	5.3	5.9
Pacific	2,412	2,528	2,826	52.9	51.1	51.6
Alaska and Hawaii	[b]	21	2	[a]	0.4	[a]
ELECTRONICS AND COMMUNICATION EQUIPMENT	$4,388	$3,980	$4,036	100.0	100.0	100.0
New England	575	552	486	13.1	13.9	12.1
Middle Atlantic	1,200	1,095	1,026	27.3	27.5	25.4
East North Central	424	409	447	9.7	10.3	11.1
West North Central	248	192	221	5.6	4.8	5.5
South Atlantic	665	520	596	15.2	13.1	14.8
South Central	232	254	262	5.3	6.4	6.5
Mountain	88	109	96	2.0	2.7	2.4
Pacific	944	833	873	21.5	20.9	21.6
Alaska and Hawaii	12	16	29	0.3	0.4	0.7

[a] Less than 0.05%.
[b] Less than $500,000.
Source: Department of Defense, Office of the Secretary of Defense, Directorate of Statistical Services, "Military Prime Contract Awards by Region and State, Fiscal Years 1967, 1968, 1969".

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 1969
(Dollar Figures in Millions)

Region	Type of Contractor							
	Total		Educational Institutions		Other Non-Profit Institutions[a]		Business Firms	
	Million Dollars	Percent	Million Dollars	Percent	Million Dollars	Percent	Million Dollars	Percent
TOTAL	$5,940	100.0	$378	100.0	$276	100.0	$5,286	100.0
New England	601	10.1	119	31.5	30	11.0	452	8.5
Middle Atlantic	1,051	17.7	53	14.1	28	10.3	970	18.3
East North Central	357	6.0	38	10.1	24	8.8	295	5.6
West North Central	159	2.7	12	3.1	2	0.7	145	2.7
South Atlantic	756	12.7	76	20.1	42	15.3	638	12.1
South Central	350	5.9	17	4.5	9	3.1	324	6.1
Mountain	23	3.9	19	4.9	6	2.2	209	4.0
Pacific	2,410	40.6	37	9.8	134	48.4	2,239	42.4
Alaska and Hawaii	22	0.4	7	1.9	1	0.2	14	0.3

[a] Includes contracts with other government agencies.
Source: Department of Defense, Office of the Secretary of Defense, Directorate of Statistical Services, "Military Prime Contract Awards by Region and State, Fiscal Years 1967, 1968, 1969".



The air transport industry during 1969 reached a record high in traffic, but earnings continued to decline.

Domestic traffic, measured in revenue passenger-miles, amounted to nearly 96 billion while international traffic attained nearly 30 billion revenue passenger miles. Both were substantial increases over 1968. At the same time, net operating income dropped to $311 million from $411 million in 1968.

Stuart G. Tipton, president of the Air Transport Association, stated: "The industry rate of return (on total investment) is disappointing and is still substantially below to 10.5 percent that the Civil Aeronautics Board has set as a reasonable rate of return for the industry. With traffic expected to double by 1975, the airlines must invest billions of dollars in new flight equipment. Adequate earnings are the key to maintaining this investment."

Total orders for turbine-powered aircraft, including both transport and executive type aircraft, amounted to 1,234 units for delivery in 1970 and later with a total value of more than $8.6 billion dollars. Transport aircraft accounted for 608 units with a value of more than $8.1 billion.

At the end of 1969 the total gross value of flight equipment for U.S. domestic carriers amounted to more than $8 billion.

The "Made in U.S.A." label continued to dominate in aircraft operated by the world's free airlines. During 1968, the International Air Transport Association reported 3,903 aircraft in operation of which 2,890 were manufactured in the U.S. This is 74 percent of the total.

Hours flown by general aviation aircraft reached a new high of more than 24 million hours and miles flown reached a new high of 3.7 billion. The general aviation fleet amounted to a record 124,237 aircraft.

PUBLIC AIRPORTS BY LENGTH OF RUNWAY AND REGION, January 1, 1969

Region	TOTAL	Airports by Length of Runway (in feet)		
		Under 5,000	5,000–9,999	10,000 & over
TOTAL	10,470	9,122	1,106	242
New England	427	350	56	21
Middle Atlantic	972	887	63	22
East North Central	1,573	1,447	107	19
West North Central	1,611	1,485	105	21
South Atlantic	1,035	879	144	12
East South Central	433	383	50	—
West South Central	1,483	1,326	135	22
Mountain	1,104	861	233	10
Pacific	1,804	1,484	207	113
Other	28	20	6	2

Department of Transportation, Federal Aviation Administration.

U. S. MANUFACTURED AIRCRAFT IN OPERATION ON WORLD AIRLINES
Calendar Years 1962 to Date

	1962	1963	1964	1965	1966	1967	1968
TOTAL MANUFACTURED IN U. S.	2,345	2,266	2,317	2,548	2,556	2,735	2,890
4 Engine	1,474	1,434	1,417	1,493	1,410	1,424	1,374
Turbojets	517	580	627	738	825	941	1,102
Boeing 707	209	206	233	291	365	467	547
Boeing 720	51	55	109	119	118	121	119
Boeing 720B	25	52					
McDonnell Douglas DC-8	167	183	199	236	254	276	372
Convair 880	44	53	53	52	53	58	48
Convair 990	21	31	33	40	35	19	16
Turboprops	137	137	137	136	136	127	85
Lockheed Electra	137	137	137	136	133	124	82
Lockheed L-100 Hercules	—	—	—	—	3	3	3
Piston Engine	820	717	655	619	449	356	187
Lockheed Constellation	206	179	176	136	83	31	10
Douglas DC-7	232	178	133	85	47	23	5
Douglas DC-6	277	257	250	265	210	193	76
Douglas DC-4	105	103	96	132	109	109	96
Boeing Stratocruiser	—	—	—	1	—	—	—
3 Engine	—	4	97	193	309	441	561
Boeing 727 (turbojet)	—	4	97	193	309	441	561
2 Engine	883	783	754	803	791	836	925
Turbojets	—	—	—	4	59	176	392
Boeing 737	—	—	—	—	—	—	70
Lear Jet 24	—	—	—	—	—	—	1
McDonnell Douglas DC-9	—	—	—	4	59	176	321
Turboprops	7	7	7	7	18	28	34
Fairchild F-27/F-227	7	7	7	7	18	22	23
Convair 640	—	—	—	—	—	6	10
Beech 99	—	—	—	—	—	—	1
Piston Engine	826	776	747	792	714	632	499
Convair 240, 340, 440	250	228	201	190	177	161	120
Martin 202, 404	4	4	—	4	—	—	—
Curtiss Commando C-46	36	37	38	57	56	44	23
Douglas DC-3/C-47	516	479	471	481	441	391	320
Other	20	28	37	60	40	36	36
1 Engine	12	18	19	21	13	10	12
Helicopters	26	27	30	38	33	24	18
ALL MANUFACTURERS GRAND TOTAL	3,162	3,086	3,137	3,461	3,541	3,725	3,903
Per Cent of Grand Total Manufactured in U. S.	74.2	73.4	73.9	73.6	72.2	73.4	74.0

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

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	2,300	155	106,000	2,670	625
1965	2,550	177	123,000	3,390	755
1966	2,790	200	142,000	4,010	1,050
1967	3,290	234	169,500	4,590	1,295
1968	3,735	262	192,500	5,575	1,610
1969	4,130	289	217,000	6,895	1,705

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).

COMPOSITION OF U. S. AIR LINE FLEET, BY TYPE OF AIRCRAFT, NUMBER OF ENGINES, AND MODEL, JANUARY 1, 1968, 1969, AND 1970
(Number of Aircraft)

Type of Aircraft, Number of Engines, and Model	1970	1969	1968
TOTAL AIRCRAFT	2,690	2,586	2,452
Total fixed-wing	2,672	2,570	2,430
Turbine-powered—total	2,448	2,239	1,788
Four-engine—total	997	983	902
Turbojet—total	886	816	706
Boeing 707	428	393	338
Boeing 720	127	134	135
Boeing 747	1	—	—
Convair 880	41	41	45
Convair 990	6	11	14
McDonnell Douglas DC-8	283	237	173
Lockheed 1329	—	—	1
Turboprop—total	111	167	196
Armstrong Whitworth Argosy AW-650	8	7	5
Canadair CL-44	9	14	19
Lockheed 188	73	114	125
Lockheed 382	18	13	9
Vickers Viscount 745	3	19	38
Three-engine—total	628	543	410
Turbojet—total	628	543	410
Boeing 727	628	543	410
Twin-engine—total	818	706	469
Turbojet—total	554	422	228
Boeing 737	147	76	—
British Aircraft Corp. BAC-111	60	60	57
Sud Aviation Caravelle SE-210	20	20	20
McDonnell Douglas DC-9	327	266	148
Dassault SE-20	—	—	3
Turboprop—total	264	284	241
Convair 240T	24	36	29
Convair 340T	119	113	85
DeHavilland DH/DH-C	9	6	3
Fairchild F-27	38	48	49
Fairchild FH-227	53	55	58
Grumman G-159	1	1	1
Grumman G21T	1	2	1
Nord 262	—	12	12
Short SC-7	2	2	1
Nihon YS-11	17	9	2

(Continued on next page)

COMPOSITION OF U. S. AIR LINE FLEET, BY TYPE OF AIRCRAFT, NUMBER OF ENGINES AND MODEL, JANUARY 1, 1968, 1969, and 1970—*Continued*
(Number of Aircraft)

Type of Aircraft, Number of Engines, and Model	1970	1969	1968
Single-engine turboprop—total	5	7	7
Pilatus PC-6A	2	3	3
Pilatus PC-6B	3	4	4
Piston-powered—total	224	331	642
Four-engine—total	64	82	265
Boeing 377	1	—	—
Douglas DC-4	11	8	10
Douglas DC-6	33	40	133
Douglas DC-7	14	29	55
Lockheed 049/149	—	4	5
Lockheed 749	1	1	7
Lockheed 1049/1649	4	—	55
Twin-engine—total	153	234	357
Aero Commander 680E	1	1	1
Convair 28-5-ACF	2	4	4
Convair 240	1	3	12
Convair 340/440	7	46	78
Curtiss C-46	43	44	63
Douglas DC-3	37	56	107
Fairchild C82	2	4	4
Grumman G-21	11	17	18
Grumman G-44	3	3	2
Grumman G-73	1	1	2
Grumman SA-16	2	2	2
Martin 202	1	2	2
Martin 404	38	47	57
Other	4	4	5
Single-engine—total	7	15	20
Rotary Wing—total	18	16	22
Turbine-powered—total	15	13	17
Sikorsky S-61	8	8	9
Sikorsky S-62	—	1	1
Vertol V-107-II	4	4	7
Bell BL-206	3	—	—
Piston-powered—total	3	3	5
Sikorsky S-55	—	—	2
Sikorsky S-58C	3	3	3

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

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	50,362	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	98,474	3,537	985
1968	2,146	150	113,958	3,872	1,268
1969	2,385	159	125,414	4,443	1,345

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.

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

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.

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 Equipment (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

[a] Comprises net investment in buildings and ground equipment, flight equipment, working capital, etc.
Note: Excludes helicopter airlines.
Sources:
Civil Aeronautics Board 1964, "Annual Report."
Civil Aeronautics Board, Costs and Statistics Section.

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

[a] Excludes helicopters.
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	5,592	4,902	182	343	9	156

[a] Includes Intra-Alaska and Intra-Hawaii carriers.
Source: Civil Aeronautics Board. Bureau of Accounts and Statistics.

Operating Revenues, Expenses and Net Operating Income of Scheduled Domestic Passenger/Cargo Operatorsand Certificated Air Carriers[a]
Calendar Years 1957 to Date
(Millions of Dollars)

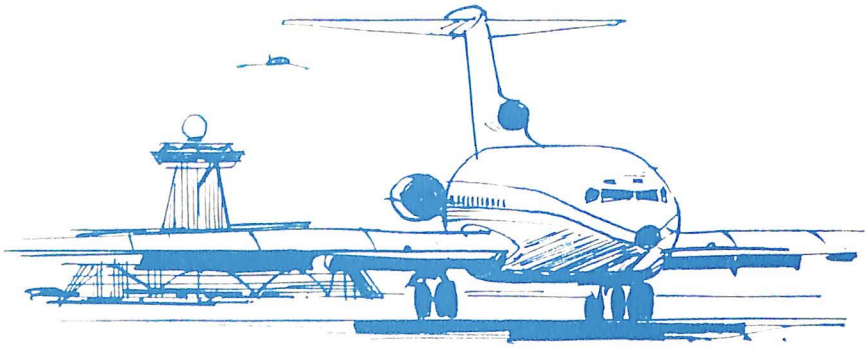
Calendar Years	Total Operating Revenues	Total Operating Expense	Net Operating Income
1957	$1,530	$1,489	$ 41
1958	1,636	1,539	97
1959	1,955	1,848	107
1960	2,129	2,091	38
1961	2,245	2,244	1
1962	2,498	2,408	90
1963	2,722	2,580	142
1964	3,094	2,778	316
1965	3,608	3,165	443
1966	4,070	3,589	481
1967	4,887	4,476	411
1968	5,592	5,281	311

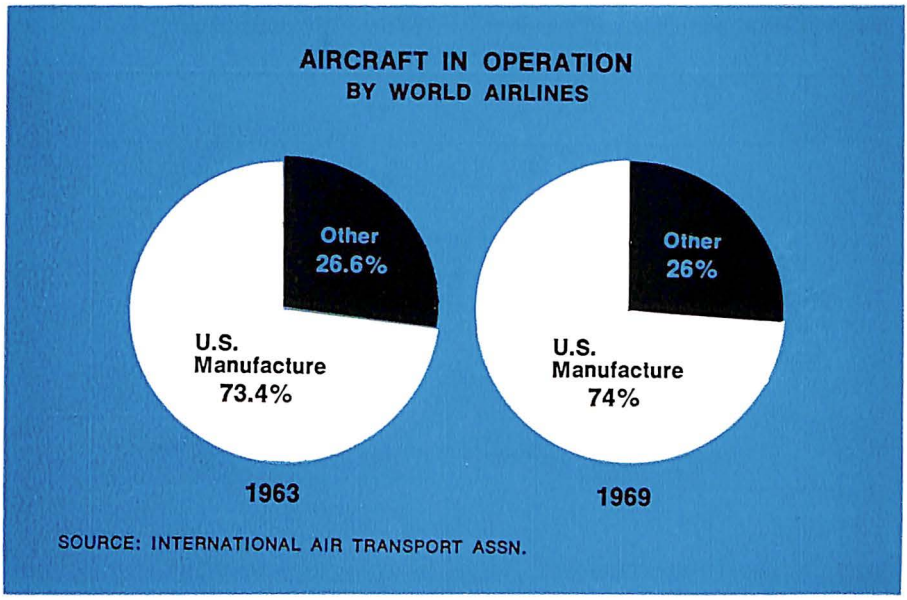
Note: Figures before 1961 do not include certain items of ground and indirect expense
[a] Includes Intra-Alaska and Intra-Hawaii carriers
Source: Civil Aeronautics Board Bureau of Accounts and Statistics

INVENTORY OF CIVIL AIRCRAFT
Including Air Carrier Aircraft
1928 to Date

Year As of January 1	TOTAL	Eligible	Ineligible
1928	2,740	N.A.	N.A.
1932	10,680	N.A.	N.A.
1935	8,322	N.A.	N.A.
1941	26,013	N.A.	N.A.
1951	92,809	60,921	31,888
1952	88,545	54,039	34,506
1955	92,067	58,994	33,073
1956	85,320	60,432	24,888
1957	87,531	64,688	22,843
1958	93,189	67,153	26,036
1959	98,893	69,718	29,175
1960	105,309	70,747	34,562
1961	111,580	78,760	32,820
1962	117,904	82,853	35,051
1963	124,273	86,287	37,986
1964	129,975	87,267	42,708
1965	137,189	90,935	46,254
1966	142,078	97,741	44,337
1967	155,132	107,085	48,047
1968	166,598	116,781	49,817
1969	179,285	127,164	52,121

NOTE: An eligible aircraft is an aircraft with a current airworthiness certificate which, through a periodic or progressive inspection, has been renewed within the past 12 months.
N.A.—Not available.
Source: Federal Aviation Administration. "FAA Statistical Handbook of Aviation" (Annually).





INVENTORY OF ELIGIBLE CIVIL AIRCRAFT, BY YEAR OF MANUFACTURE
As of January 1, 1969

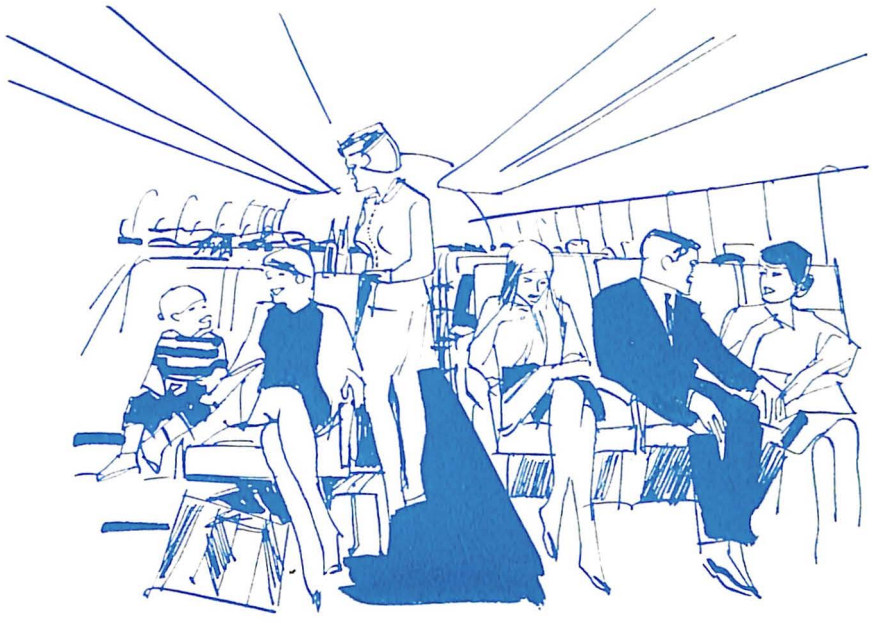
Year of Manufacture	Number	Percent of Total
TOTAL	127,164	100.0
1968	10,805	8.5
1967	10,335	8.1
1966	12,426	9.8
1965	9,242	7.3
1964	6,985	5.5
1963	5,358	4.2
1962	4,629	3.6
1961	4,415	3.5
1960	5,080	4.0
1959	5,473	4.3
1958 and prior years	52,416	41.2

NOTE: An eligible aircraft is an aircraft with a current airworthiness certificate which, through a periodic or progressive inspection, has been renewed within the past 12 months.
Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Monthly).

ELIGIBLE CIVIL AIRCRAFT BY TYPE AND CIVIL AIRPORTS
Calendar Years 1954 to Date

Year Jan. 1	Active Civil Aircraft								Airports on Record with FAA
	TOTAL	Total Air Carrier[a]	General Aviation Aircraft						
			TOTAL	Fixed-Wing Aircraft			Rotorcraft[b]	Other[c]	
				Multi-engine	Single-Engine				
					4-place & over	3-place & less			
1954	55,505	1,615	53,890	N.A.	N.A.	N.A.	N.A.	N.A.	6,780
1955	58,994	1,606	57,388	2,600	17,078	37,278	235	197	6,977
1956	60,432	1,642	58,790	3,342	19,240	35,654	283	271	6,839
1957	64,638	1,802	62,886	4,183	22,805	35,291	350	257	7,028
1958	67,153	1,864	65,289	5,036	23,751	35,809	433	260	6,412
1959	69,718	1,879	67,839	5,416	26,170	35,440	521	292	6,018
1960[d]	70,747	2,020	68,727	6,034	27,301	34,543	525	324	6,426
1961	78,760	2,211	76,549	7,243	34,829	33,472	634	361	6,881
1962	82,853	2,221	80,632	8,401	38,206	32,800	798	427	7,715
1963	86,287	2,166	84,121	9,186	41,120	32,341	967	507	8,084
1964	87,267	2,179	85,088	9,695	42,657	30,977	1,171	588	8,814
1965	90,935	2,193	88,742	10,644	45,777	30,367	1,306	648	9,490
1966	97,741	2,299	95,442	11,977	49,789	31,364	1,503	809	9,566
1967	107,085	2,379	104,706	13,548	52,972	35,687	1,622	877	9,673
1968	116,781	2,595	114,186	14,651	56,865	39,675	1,899	1,096	10,126
1969	127,164	2,927	124,237	16,760	60,977	42,830	2,350	1,320	10,470

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."



ACTIVE AIRMAN CERTIFICATES HELD
1955 to Date

Year as of Jan. 1	Pilots						Non-pilots	Other
	TOTAL	Students	Private	Commercial	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	116,635	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

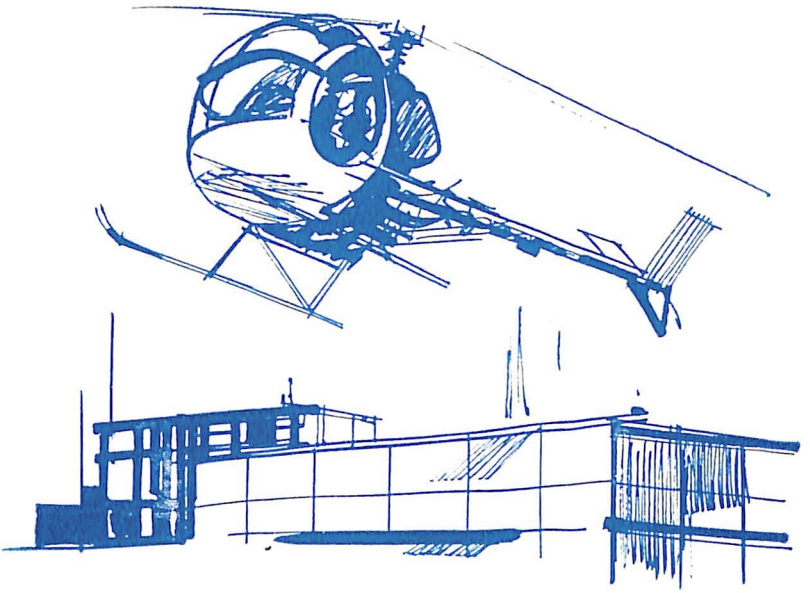
[E] Estimate.
[a] Includes special certificates issued to foreign nationals.
Source: Federal Aviation Administration, Office of Management Systems.

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

Year Ending December 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
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

[a] Less than 0.5 per cent.
Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Annually).

VERTICAL LIFT AIRCRAFT



Corporations and law enforcements agencies continue during 1969 as the major civil users of helicopters.

A survey conducted by the AIA's Vertical Lift Aircraft Council in 1969 of the commercial, executive and civil government helicopter operators in the United States and Canada established a total of 1,379 operators and 3,433 helicopters operated. This revealed an increase of 35 percent in the number of operators and 45 percent in the number of helicopters compared to the 1967 survey.

Of these, the largest increase in operators—40 percent—was in the number of companies and executives that own and operate helicopters. These corporate owners also show the largest increase in the number of helicopters operated—an increase of 58 percent over the 1967 total.

The 27 percent increase in the number of civil government agencies using helicopters reflects the effective role of helicopters as the air arm for law enforcement—for patrol, crime and control and rescue.

During 1969, with matching Federal funds available under the 1966 National Highway Safety Act, nine state highway patrols purchased 21 helicopters. By year's end more than 45 city and state law enforcement agencies were using helicopters.

In addition, under the 1966 National Highway Safety Act Federal funds were allocated to four states during 1969 for helicopter test

demonstration programs. These programs were directed to developing emergency medical services for highways, in both rural and urban areas, using helicopter ambulances. As a result more communities are considering the addition of ambulance helicopters to supplement their existing land ambulance fleets and are planning ahead by providing hospital heliports.

The number of helicopter pilots increased from 17,607 in 1968 to 20,896 by the end of 1969.

In 1969, thirteen of the fifteen member companies of the Vertical Lift Aircraft Council reported ninety-six models were in operation/production ranging in size from 1 to 50 place. In addition, twenty-one flight test, research and development models were reported.

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

Source: Civil Aeronautics Board.

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	1,703	1,622	34	36	7	4

Source: Civil Aeronautics Board.

HELICOPTER PILOTS
As of 1 January, 1970

Type	TOTAL	Helicopter Only	Helicopter and Airplane	Other
TOTAL	20,896	4,270	16,567	59
Private	914	224	674	16
Commercial	19,664	3,827	15,794	43
Airline Transport Rating	318	219	99	—

Source: Federal Aviation Administration, Statistical Department.

Heliports and Helistops in the United States, Canada, and Puerto Rico 1960 to Date

Region	1960	1963	1964	1965	1966	1968
Total	357	797	1,000	1,118	1,225	1,892
(elevated)	N.A.	N.A.	N.A.	(95)	(125)	(158)
New England	17	67	95	88	93	138
Middle Atlantic	42	90	148	179	203	346
East North Central	126	169	151	122	139	258
West North Central	8	26	36	47	43	81
South Atlantic	21	54	83	97	105	157
East South Central	8	13	20	25	28	41
West South Central	36	73	87	116	118	195
Mountain	15	60	77	78	92	126
Pacific	73	203	262	320	358	470
Other	11	42	42	46	46	80

N.A.—Not available.
Note: Data for 1967 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]
Total	34	67	88	147	161
New England	1	2	2	2	2
Middle Atlantic	4	8	10	19	22
East North Central	1	12	14	50	52
West North Central	—	1	2	4	4
South Atlantic	10	13	16	19	24
East South Central	—	1	1	1	1
West South Central	9	13	16	16	17
Mountain	1	3	8	9	11
Pacific	8	14	19	27	28

[a] In addition to those in operation, 21 are proposed. There is one hospital heliport in Toronto, Canada, also.
[b] In addition to those in operation, 39 are proposed.
[c] In addition to those in operation, 34 are proposed.
Source: Aerospace Industries Association.

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
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

NOTE: Includes United States and Canada.
[a] Federal, state and local governments.
Source: Aerospace Industries Association, company reports.

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