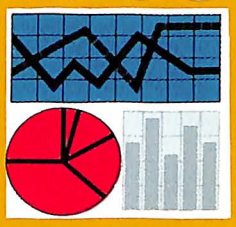
AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

1969



AEROSPACE FACTS & FIGURES

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

1969 AEROSPACE FACTS & FIGURES

COMPILED BY THE OFFICE OF PUBLIC AFFAIRS

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FOREWORD

The statistical measurements of the aerospace industry's activities in 1968 continued to show a pattern of sustained growth.

These are:

• Sales of industry products and services reached $29.5 billion in 1968, an 8.1 percent gain over 1967 sales of $27.3 billion. Civil transport-type aircraft accounted for the major share of this increase. However, sales in the category are expected to decline in 1969 as current models are phased out before deliveries of the third generation jet transports are made in substantial quantities.

• Although total sales of the industry are expected to decline slightly in 1969 (estimate: $28.7 billion), the backlog of the aerospace industry at year's end for 60 major companies was $31 billion. This is approximately two and one half times the backlog reported only eight years ago.

• During 1968, the aerospace industry remained in its position as the nation's largest manufacturing employer with more than 1.4 million workers. The second largest manufacturing employer—the automobile industry —reported about 900,000 workers. For the first time, employment of scientists and engineers engaged in research and development rose above 100,000, reaching a total of 106,000. The National Science Foundation reported that the aerospace industry was the largest employer of scientists and engineers in R&D assignments.

• The curve of aerospace exports continued up in 1968, reaching a new high of nearly $3 billion in 1968. This is 33 percent higher than the previous year; it is double industry exports only a decade ago. Commercial transport-type aircraft in 1968 nearly doubled over 1967 as 240 aircraft valued at $1.2 billion were delivered to foreign customers.

• The industry gained in aircraft production with an estimated 18,976 aircraft coming off the assembly lines in 1968. Civilian aircraft accounted for most of the production. This compares with 18,660 aircraft produced in the previous year. Aircraft sales of major manufacturers attained a new high of $13.9 billion, approximately $2 billion more than in 1967. Civil

aircraft backlog amounted to $12.6 billion while military aircraft accounted for a backlog of about $8.2 billion. General aviation manufacturers in 1968 produced 13,698 aircraft valued at $421.5 million. The increased dollar volume was largely due to the introduction of new twin-engine aircraft and increased sales of turbine-powered planes. Civilian helicopter production increased from 455 units to 522 units between 1967 and 1968.

- Overall expenditures for space programs during Fiscal Year 1969 were estimated at $6.3 billion. This breaks down to $4.1 billion for the National Aeronautics and Space Administration, $2.1 billion for Department of Defense, $117 million for the Atomic Energy Commission and $34 million spread among other agencies. Expenditures for space in 1968 represented a decline of about $300 million from 1967.
- The industry's production of missile systems totaled $2.81 billion in 1968 compared with $2.87 billion in 1967. However, the backlog at the end of 1968 reached $3.22 billion, the highest point in the decade of the sixties. This backlog points to increased sales during 1969.
- Expenditures for aerospace research and development in Fiscal Year 1969, including NASA expenditures, reached $8 billion.
- The industry's ratio of profit to sales rose from 2.7 percent in 1967 to 3.2 percent in 1968. This is substantially below the 5.1 percent average of all manufacturing industries.

This 1969 edition of *Aerospace Facts and Figures* provides detailed statistical information on historical trends in industry for the use of management in both government and industry, legislators, writers and editors, and analysts and students.

KARL G. HARR, JR.
President
Aerospace Industries Association

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AEROSPACE SUMMARY

Commercial sales of the aerospace industry largely accounted for the increase of total aerospace sales of $29.5 billion in 1968 compared with $27.3 billion in 1967.

These commercial sales include turbine-powered transports, executive and utility fixed wing aircraft, helicopters, aircraft engines and spare parts for these products.

Aerospace industry sales, by product group, during 1968 were: aircraft, $17,088 million; missiles, $4,706 million; space vehicles, $5,150 million; non-aerospace, $2,558 million. Estimated total sales for 1969 are $28.7 billion, down about $800 million from 1968. By product, the estimate for 1969 is: aircraft, $15,700 million; missiles, $5,400 million; space vehicles, $4,890 million; and non-aerospace, $2,700 million.

The expected decline in aircraft sales is principally due to a gradual phasing out of current models before the advent of the high passenger capacity third generation jet transports. The backlog for jet transports is increasing while current deliveries are decreasing.

Sales to the Department of Defense during 1968 increased to $16,595 million from $15,855 million in the previous year. Sales to the National

Aeronautics and Space Administration and other government agencies declined slightly from $4,201 million in 1967 to $3,920 million in 1968. Largest sales increase was in the non-government category which rose to $6,429 million in 1968 from $4,632 million in 1967.

Contribution (the value added by manufacturing with adjustments for taxes and services) of the aerospace industry to the Gross National Product was $16.1 billion in 1968. The aerospace contribution was 1.9 percent of the total GNP, the same as in 1967.

Backlog of the 60-odd major aerospace companies at the end of 1968 was nearly $31 billion, two and one half times as high as the 1960 backlog. The government backlog accounted for about $16.4 billion and other customers accounted for about $14.6 billion. However, in aircraft and engine orders, "other" customers amounted to $12.6 billion compared with approximately $8.2 billion in government aircraft and engine orders.

The aerospace industry during 1968 continued to be the nation's largest manufacturing employer with 1,418,000 workers. The aerospace industry accounts for 7.2 percent of all manufacturing employees. This per-

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	789.7	548.5	299.7	27.3	3.4	5.0	9.1
1968	860.6	603.7	331.0	29.5	3.4	4.9	8.9

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.

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

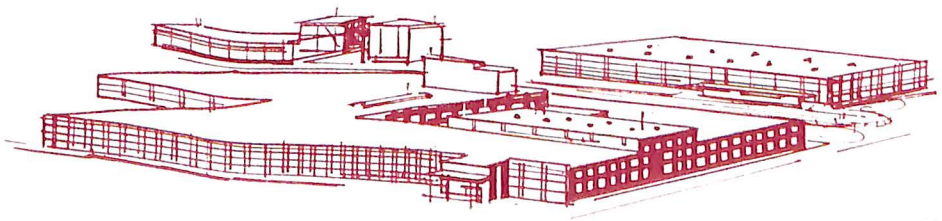
Year	Total Gross National Product	Contribution to GNP by		Aerospace Contribution as Percent of	
		Manufacturing Industries	Aerospace Industry	GNP	Manufacturing Industries
1960	$503.7	$144.4	$ 8.5[r]	1.7	5.9
1961	520.1	144.2	8.8[r]	1.7	6.1
1962	560.3	158.8	10.0[r]	1.8	6.3
1963	590.5	167.0	10.6[r]	1.8	6.3
1964	632.4	180.3	10.7	1.7	5.9
1965	684.9[r]	197.7	11.0	1.6	5.6
1966	747.6[r]	218.6	13.5[r]	1.8	6.2
1967	789.7[r]	224.3	14.8[r]	1.9	6.6
1968	860.6	246.9	16.1	1.9	6.5

[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.

centage ratio is the same as in 1967. The aerospace payroll in 1968 amounted to an estimated $13.8 billion compared with about $12.7 billion in 1967, an increase of more than a billion dollars.

Net profit after taxes (as a percentage of sales) increased in 1968 to 3.2 percent from 2.7 percent in 1967; however, the net profit ratio for all manufacturing averaged 5.1 percent in 1968.

Exports of aerospace products in 1968 amounted to nearly $3 billion. This compares with aerospace exports of about $1.4 billion only a decade ago. Aerospace accounts for nearly 9 percent of all U. S. exports.



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	29,502	17,088	4,706	5,150	2,558
1969[E]	28,690	15,700	5,400	4,890	2,700

NOTE: Includes military and nonmilitary sales and research, development, test and evaluation. Because of changes in source material, individual years are not always strictly comparable. Nonaerospace figures exclude sales by nonaerospace establishments.
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	29,502	16,595	3,920	6,429	2,558
1969[E]	28,690	16,700	3,690	5,600	2,700

NOTE: Includes military and nonmilitary sales and research, development, test and evaluation. Because of changes in source material, individual years are not always strictly comparable. Nonaerospace figures exclude sales by nonaerospace establishments.
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 Enging June 30	
	1962	1963
TOTAL	$48,205	$49,973
PROCUREMENT	14,532	16,632
AIRCRAFT	6,400	6,309
MISSILES	3,442	3,817
Ships	1,906	2,522
Ordnance, Vehicles, & Related Equipment	1,137	1,665
Electronics and Communications	1,139	1,427
Other procurement	508	892
RESEARCH, DEVELOPMENT, TEST AND EVALUATION	6,319	6,376
AIRCRAFT	624	544
MISSILES	2,777	2,241
ASTRONAUTICS	749	946
Other	2,169	2,645
MILITARY ASSISTANCE	1,390	1,721
AIRCRAFT AND MISSILES	367	445
Other	1,023	1,276
Military Construction	1,347	1,144
Family Housing	—	427
Civil Defense	90	203
Military Personnel	13,032	13,000
Active Forces	11,530	11,386
Reserve Forces	607	599
Retired Pay	894	1,015
Operations and Maintenance	11,594	11,874
Other	(99)	(1,404)

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

Year Ending June 30						
1964	1965	1966	1967	1968	1969	1970
$51,245	$47,401	$55,377	$68,460	$78,027	$78,400	$79,000
15,351	11,839	14,339	19,012	23,283	24,337	23,435
6,058	5,200	6,635	8,411	9,462	8,990	8,231
3,577	2,096	2,069	1,930	2,219	2,879	3,226
2,078	1,713	1,479	1,398	1,356	1,700	1,676
1,597	1,073	1,697	3,978	5,990	6,907	6,671
1,264	896	983	1,284	1,595	1,555	1,384
782	861	1,473	2,011	2,661	2,306	2,247
7,021	6,236	6,259	7,160	7,747	7,545	7,805
939	1,017	976	1,048	1,335	946	1,202
2,352	1,901	1,801	2,502	2,522	2,485	2,436
1,284	921	930	983	1,220	1,186	1,147
2,446	2,397	2,552	2,627	2,670	2,928	3,020
1,485	1,229	968	873	601	548	591
218	358	299	182[a]	97[a]	65[a]	70[a]
1,276	871	1,024	691	504	483	521
1,026	1,007	1,334	1,536	1,281	1,508	1,370
580	619	647	482	495	630	625
107	93	86	100	108	82	72
14,195	14,771	16,753	19,787	21,954	23,665	24,164
12,312	12,662	14,407	17,055	18,988	20,317	20,456
674	725	755	902	871	907	988
1,209	1,384	1,591	1,830	2,095	2,441	2,720
11,932	12,349	14,710	19,000	20,578	22,106	21,841
(452)	(741)	281	510	1,980	(2,021)	(903)

E Estimate.
[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.
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	30,722	17,750	12,972	20,628[a]		5,704	1,712	917	1,761
1968	30,934	16,352	14,582	8,157	12,580	5,084	1,852	987	2,274

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	23,438	16,329	7,109	7,140	4,750	6,053	1,914	1,002	2,579
1968	25,579	16,600	8,979	7,414	6,450	6,037	2,076	1,044	2,558

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 Per Cent 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[E]	77,789	4,250	20,663	26.6
1970[E]	78,471	3,950	20,129	25.7

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[E]	16,551	11,869	65	4,617
1970[E]	16,312	11,457	70	4,785

[E] Estimate.
[a] Data on Military Assistance are based on deliveries of aircraft and missiles to Air Force and Navy. These data are not included in most other tables on Department of Defense expenditures in this book.
Sources: Department of Defense, Reports "FAD 619, 620," January 13, 1969, and earlier reports; Department of Defense, "Military Assistance Facts" (Annually); "The Budget of the United States Government" (Annually).

Department of Defense
Direct Obligations for Aerospace Activities
Fiscal Years 1960 to Date
(Millions of Dollars)

Year Ending June 30	Total	Aircraft	Missiles	Astronautics
1960	$11,624	$ 6,513	$4,672	$ 439
1961	11,098	5,667	4,911	520
1962	13,017	6,591	5,604	822
1963	14,112	6,499	6,415	1,198
1964	13,567	6,254	5,822	1,491
1965	11,913	6,986	4,030	897
1966	14,132	9,310	3,846	976
1967	17,270	11,703	4,427	1,140
1968	16,848	10,930	4,844	1,074
1969[E]	15,847	8,944	5,724	1,179
1970[E]	17,076	9,505	6,419	1,152

[E] Estimate.
Source: Department of Defense, Reports "FAD 619, 620", January 13, 1969, 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
Addenda:				
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

Sources: Manufacturing and Durable Goods: Bureau of Labor Statistics, "Employment and Earnings," (Monthly); Aerospace: Aerospace Industries Association, 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[r]	6,220[r]	5,174	6.8	8.9
1967	1,392	645	747	12,659	6,860[r]	5,779	7.2	9.4
1968	1,418	664	754	13,759	7,728[E]	6,031[E]	7.2	9.5

[r] Revised
[E] Estimate
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, 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	Commercial Transports	Other Aerospace Products	
			(1912–1957 only)		
1912	$ 2,170.3	$ 0.1	$ 0.1		[a]
1915–18	22,176.7	31.5	31.5		0.14
1922	3,765.1	0.5	0.5		[a]
1929	5,157.1	9.1	9.1		0.18
1931	2,378.0	4.9	0.2		0.2
1939	3,123.3	117.8	117.8		3.8
1944	14,161.5	2,818.2	2,818.2		19.9
1948	12,523	154	$ 37	$117	1.2
1950	10,142	242	40	202	2.4
1951	14,879	301	13	288	2.0
1952	15,049	603	18	585	4.0
1953	15,652	881	79	802	5.6
1954	14,981	619	93	526	4.1
1955	15,419	728	81	647	4.7
1956	18,940	1,059	133	926	5.6
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	23,062	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	34,227	2,995	767	2,228	8.8

[a] Less than 0.5 per cent.
Sources: Bureau of the Census, "U. S. Exports of Domestic Merchandise, Schedule B Commodity by Country of Destination," 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	Per Cent 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	2,731	73.3

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 Per Cent of Sales for Manufacturing Corporations
Calendar Years 1957 to Date

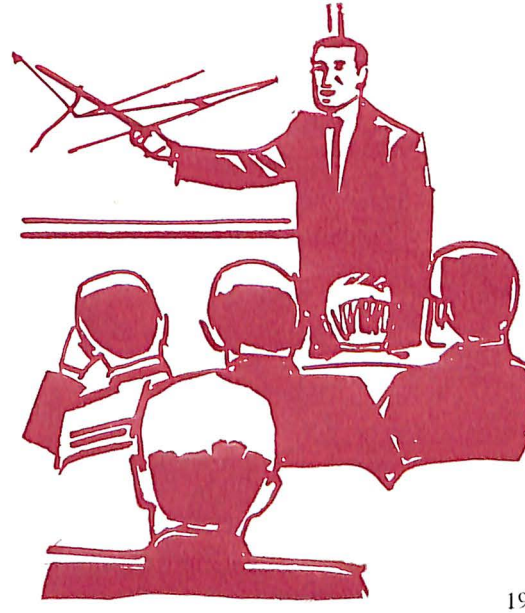
Year	All Manufacturing Corporations (except Newspapers)	Non-Durable Goods	Durable Goods	Aerospace
1957	4.8%	4.9%	4.8%	2.9%
1958	4.2	4.4	3.9	2.4
1959	4.8	4.9	4.8	1.6
1960	4.4	4.8	4.0	1.4
1961	4.3	4.7	3.9	1.8
1962	4.5	4.7	4.4	2.4
1963	4.7	4.9	4.5	2.3
1964	5.2	5.4	5.1	2.6
1965	5.6	5.5	5.7	3.2
1966	5.6	5.5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

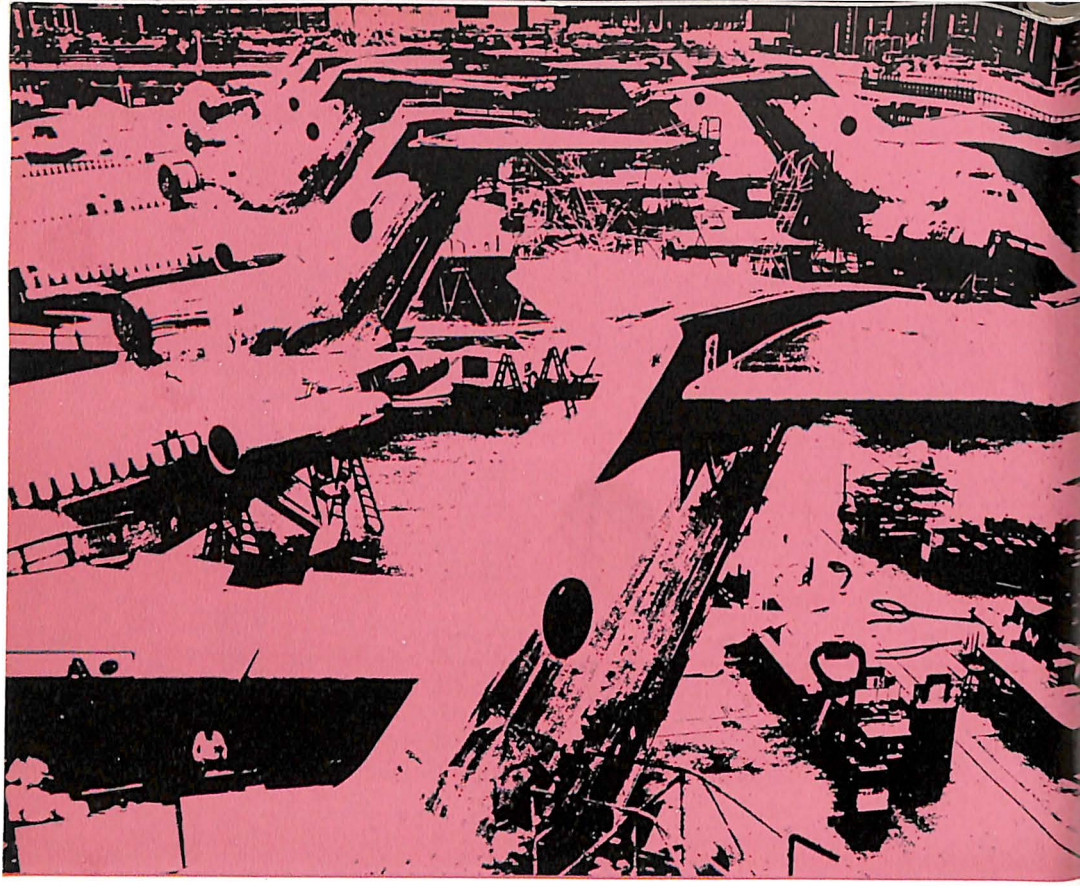
Source: Securities & Exchange Commission Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations."

DIRECT FEDERAL OBLIGATIONS FOR AEROSPACE PRODUCTS AND SERVICES 1960 to Date (Millions of Dollars)

Year Ending June 30	TOTAL	Department of Defense	National Aeronautics and Space Administration
1960	$11,939	$11,624	$ 315
1961	11,751	11,098	653
1962	14,321	13,017	1,304
1963	16,628	14,112	2,516
1964	17,443	13,567	3,876
1965	16,257	11,913	4,344
1966	19,212	14,132	5,080
1967	22,166	17,270	4,896
1968	21,304	16,848	4,456
1969[E]	19,955	15,847	4,108
1970[E]	20,896	17,076	3,820

NOTE: NASA excludes construction of facilities.
[E] Estimate.
Sources: Department of Defense, Reports "FAD 619, 620", January 13, 1969, and earlier reports; National Aeronautics and Space Administration, The Budget of the United States Government (Annually)





AIRCRAFT PRODUCTION

Significant gains were registered by the aerospace industry in aircraft production in 1968, not only in numbers but in the size of aircraft produced. An estimated 18,976 aircraft were rolled off assembly lines of the nation's aircraft manufacturers in a year which also saw Lockheed roll out its huge C-5A military airlifter and Boeing its 747 passenger transport, heralding a new generation of very large jet transports.

Commercial transport production rose sharply accounting for 702 of the 14,976 civil aircraft produced compared to 480 in 1967. General aviation aircraft produced numbered 13,698, up from 13,577 in 1967. Commercial helicopter production increased from 455 in 1967 to 522 in 1968.

Aircraft sales continued an upward climb begun in 1964, reaching a new high for the industry of $13.9 billion, about $2 billion higher than the year previous. Civil aircraft sales during the year surged ahead strongly with a total of $6.5 billion compared to $4.8 billion the year previous. Military sales, on the other hand, gained only slightly from $7.1 billion in 1967 to $7.4 billion in 1968.

The backlog of aircraft orders held by manufacturers, while not as dramatic as the more than $2 billion gain seen the year before, climbed from $20.6 billion in 1967 to $20.7 billion in 1968, almost seven times the backlog of the industry in the post-World War II period. By far the largest backlog was in civil aircraft which totaled $12.6 billion while military backlog approximated $8.2 billion.

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

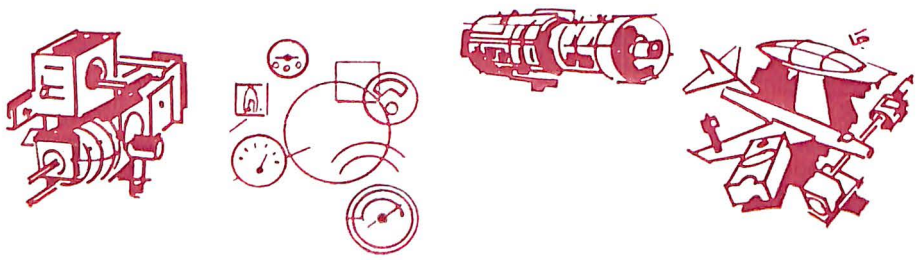
Year Ending December 31	Aircraft, Aircraft Engines, Propellers, and Parts	
	Net Sales During Year	Backlog December 31
1948	$ 1,061[a]	$ 2,983
1949	1,668	2,853
1950	2,116	4,717
1951	2,872	11,898
1952	5,654	16,692
1953	7,754	15,928
1954	7,471	13,755
1955	7,231	13,864
1956	7,689	16,000
1957	9,482	12,363
1958	8,661	10,182
1959	7,206	8,082
1960	6,429	8,171
1961	5,855	7,192
1962	5,900	6,572
1963	5,617	6,811
1964	6,431	7,797
1965	7,057	11,388
1966	8,725	18,479
1967	11,890	20,628
1968	13,864	20,737

[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 M37D (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 Sales			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	11,890	7,140	4,750	5,344	3,735	1,796	1,015	[b]	[b]
1968	13,864	7,414	6,450	5,697	5,194	1,717	1,256	[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[E]	8,990	5,300	2,848	842
1970[E]	8,231	4,830	2,616	785

N.A.—Not available.
[E] Estimate.
Source: Department of Defense, Report "FAD 619", January 13, 1969, 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 Backlog			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	20,737	8,157	12,580	5,999	10,780	2,158	1,800	[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).

AIRCRAFT PRODUCTION

NUMBER OF MILITARY AIRCRAFT, MISSILES, AND OTHER ITEMS PROGRAMMED 1969 AND 1970, BY SERVICE

Major Item	Year Ending June 30	
	1969[a]	1970
AIRCRAFT—Total	3,122	2,173
Air Force	990	650
Navy and Marine Corps	639	509
Army	1,493	1,014
Helicopters	1,944	1,272
Fixed Wing Aircraft	1,178	901
MISSILES—Total	38,519	49,138
Air Force	3,982	2,400
Navy and Marine Corps	5,007	3,842
Army	29,530	42,896
SHIPS—Navy—Total	24	38
New Construction	8	19
Conversions	16	19
TRACKED COMBAT VEHICLES—Total	2,619	2,496
Army	2,614	2,336
Marine Corps	5	160

[a] Includes supplemental program.
Source: Department of Defense, OASD (Comptroller), January 13, 1969.

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	18,660[E]	4,000[E]	14,660
1968	18,976[E]	4,000[E]	14,976

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
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	385.2	199.7	228.2	54.7
1962	3,816.1	1,629.5	1,005.2	674.3	193.7	249.6	63.8
1963	2,876.1	798.3	931.0	587	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

(Continued on next page)

Military Aircraft Produced: Number, Flyaway Value, and Airframe Weight—*Continued*
Calendar Years 1950 to Date

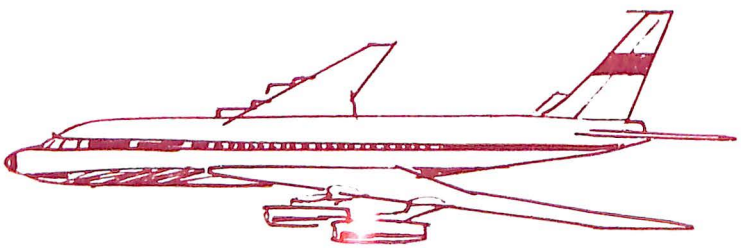
Year Ending December 31	Type of Aircraft						
	Total	Bomber	Fighter	Transport	Trainer	Helicopter	Other
AIRFRAME WEIGHT[c] (*Millions of Pounds*)							
1950	35.9	16.4	10.2	6.7	1.9	[b]	0.7
1951	50.2	17.0	15.7	11.5	3.1	[b]	2.0
1952	107.3	36.7	31.7	24.6	9.5	[b]	4.8
1953	138.0	44.1	40.7	36.5	11.3	[b]	5.4
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

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.

PRODUCTION OF COMMERCIAL TRANSPORT AIRCRAFT
1961 to Date
(Fixed Wing, Multiple Engine)

Company and Aircraft	1961	1962	1963	1964	1965	1966	1967	1968
TOTAL	198	134	100	163	233	344	480	702
Boeing								
707	11	38	28	32	54	77	113	111
720	61	30	6	6	9	6	5	—
727	—	—	6	95	112	135	115	160
737	—	—	—	—	—	—	4	105
Convair								
880	49	9	14	—	—	—	—	—
990	—	22	15	—	—	—	—	—
McDonnell-Douglas								
DC-8	42	22	19	20	31	16	41	102
DC-9	—	—	—	—	5	69	155	193
Fairchild								
F-27	8	7	6	5	12	3	3	—
FH-227	—	—	—	—	—	27	35	6
Lockheed								
Electra	21	—	—	—	—	—	—	—
130	6	6	6	—	10	11	9	25
Other	—	—	—	5	—	—	—	—

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



PRODUCTION OF GENERAL AVIATION AIRCRAFT,
BY FOURTEEN MANUFACTURERS, 1968

Manufacturer and Model	Complete Aircraft, Number	Manufacturers' Net Billing Price (Thousands of Dollars)
TOTAL	13,698	$421,522[a]
Aero Commander	435	22,309
100-500 Darter	120	
100-180 Lark	62	
Model 200	18	
A-9 Sparrow	9	
A-9B Quail	59	
B-1A Snipe	9	
S-2D Snow Commander	11	
S-2R Thrush	45	
680V Turbo II	39	
680FL Courser	9	
500 U Shrike	54	
American Aviation Corporation—		
TOTAL	33	291
AA-1 Yankee	33	
Beech—TOTAL	1,347	115,737
Airliner 99	62	
King Air 90	98	
Queen Air 88	3	
Queen Air 80	33	
Queen Air 70	1	
Queen Air 65	39	
Duke 60	31	
Super 18	4	
Baron 56TC	26	
Baron D55	174	
Baron B55	140	
Travelair 95	13	
Bonanza 36	114	
Bonanza V35TC	20	
Bonanza V35A	218	
Bonanza E33A	41	
Bonanza E33C	9	
Bonanza E33	68	
Musketeer 24	62	
Musketeer 23	86	
Musketeer 19	105	
Bellanca—TOTAL	94	2,128
260C	2	
Viking 300	20	
Super Viking	72	

(*Continued on next page*)

PRODUCTION OF GENERAL AVIATION AIRCRAFT, BY FOURTEEN MANUFACTURERS, 1968—*Continued*

Manufacturer and Model	Complete Aircraft, Number	Manufacturers' Net Billing Price (Thousands of Dollars)
Cessna—TOTAL	6,578	138,784
F150	152	
150	2,007	
F172	103	
Reims Rocket	65	
172/Skylark	1,206	
177/Cardinal	601	
180	97	
182/Skylane	778	
185/Skywagon	125	
AgWagon	142	
Super Skylane	88	
Super SkyWagon	229	
210 Centurion	112	
Turbo Centurion	78	
Super Skymaster	133	
Turbo Super Skymaster	74	
310	194	
Turbo 310	14	
Skyknight	24	
401	103	
402	67	
411	22	
Champion—TOTAL	255	$ 2,248
Citabria	255	
Lake—TOTAL	30	801
LA-4	30	
Lear Jet—TOTAL	41	28,650
24	25	
25	16	
Lockheed		
JetStar	16[a]	N.A.
Maule—TOTAL	25	332
M-2-220C	2	
M-4-210C	17	
M-4-220C	5	
M-4-C	1	
Mooney—TOTAL	579	24,707
A2A	25	
M20C Ranger	203	

(*Continued on next page*)

PRODUCTION OF GENERAL AVIATION AIRCRAFT, BY FOURTEEN MANUFACTURERS, 1968—*Continued*

Manufacturer and Model	Complete Aircraft, Number	Manufacturers' Net Billing Price (Thousands of Dollars)
M20E Chaparral	16	
M20F Executive	145	
M20G Statesman	129	
M22	12	
MU-2B	11	
MU-2D	16	
MU-2	21	
MU-2F	1	
North American Sabreliner	36[a]	N.A.
Piper—TOTAL	4,228	85,484
PA-18-150 Super Cub	138	
PA-23C-250 Aztec	132	
PA-23D-250 Aztec	165	
PA-24B-260 Comanche	67	
PA-24-400	1	
PA-25-235 Pawnee	211	
PA-25-260	145	
PA-28-140 Cherokee	1,211	
PA-28-180D Cherokee	687	
PA-28-180R Arrow	711	
PA-28-235 Cherokee	192	
PA-30B-160 Comanche	109	
PA-30C-160 Comanche	15	
PA-31-300 Navajo	206	
PA-32-260 Cherokee	87	
PA-32-300 Cherokee	151	
Ted Smith Aircraft—TOTAL	1	71
Aerostar Model 600	1	

N.A.—Not available

[a] Total dollar figures exclude Lockheed and North American.

NOTE: The totals here may differ from FAA figures because they are based on selected reports only. Excludes aircraft shipped to the military, helicopters and gliders.

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
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

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.
Source: Aerospace Industries Association, company reports.

Production of Military Helicopters
Calendar Years 1941 to Date

Year Ending December 31	Total[a]	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

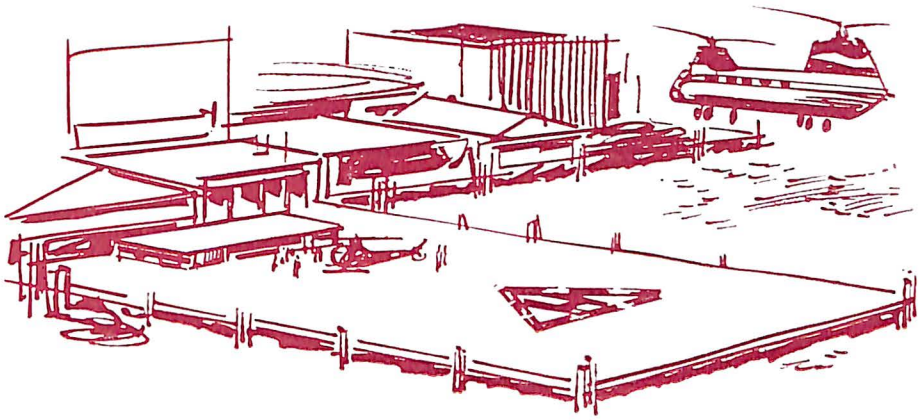
[a] The total includes helicopters bought by the Department of Defense under the Military Assistance Program and for other federal agencies.

Source: Department of Defense. Data released with a two-year lag for security reasons. For more recent data see pages 15 and 25.

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

Company and Helicopter	1960	1961	1962	1963	1964	1965	1966	1967	1968
TOTAL	266	378	407	504	579	598	583[a]	455[ab]	522[ab]
Bell									
U. S. production									
47 series	87	93	92	101	118	134	183	171	151
204 series	—	—	1	13	8	16	20	20	—
205 series	—	—	—	—	—	—	—	12	29
206 series	—	—	—	—	—	—	—	113	184
Foreign licensees									
47 series	57	70	63	81	103	123	147	N.A.	N.A.
204 series	—	—	18	32	48	48	46	N.A.	N.A.
102 series	1	2	—	—	—	—	—	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
Fairchild Hiller									
12 series	72	99	54	34	34	73	29	9	4
FH-1100	—	—	—	—	—	—	8	44	60
Hughes									
200's	—	17	86	163	46	23	—	—	—
300's	—	—	—	—	121	81	62	48	57
500's	—	—	—	—	—	—	—	—	15
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
S-62	2	10	6		5	1	9	4	3
S-64	—	—	1	1	—	—	—	—	—

N.A. Not available.
[a] Excludes 3 Fairchild "Porters" in 1966; 9 in 1967; 5 in 1968.
[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	N.A.	455[a]	N.A.
1968	N.A.	522[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	28,247[E]	25[E]	8,000[E]	17,686	2,536
1968	29,142[E]	25[E]	8,200[E]	18,182	2,735

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 1961 to Date
(Number of Engines)

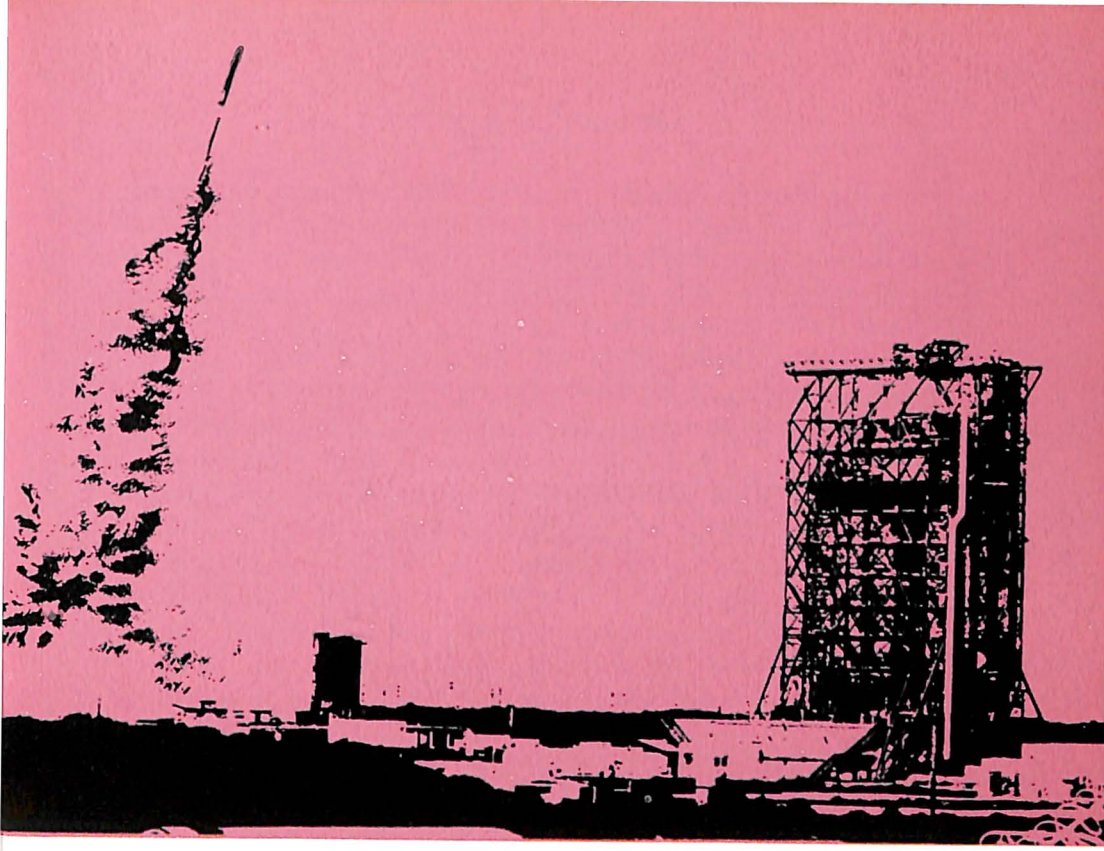
Manufacturer and Engine Designation	1961	1962	1963	1964	1965	1966	1967	1968
TOTAL	10,660	10,478	11,795	14,205	18,187	23,262	20,222	20,917
Reciprocating	9,699	9,921	11,322	13,346	17,018	21,324	17,686	18,182
Jet	991	557	473	859	1,169	1,938	2,536	2,735
Continental	5,105	5,242	5,409	6,216	9,045	11,132	7,845	7,073
O-200/C-90	828	826	773	918	2,059	3,298	2,224	1,912
O-300	987	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
O-470/IO-470/TSIO-470/GIO-470	3,060	3,120	2,630	2,627	2,434	2,508	1,337	1,656
GTSIO-520/TSIO-520/IO-520	—	—	665	1,025	1,727	2,851	2,385	2,515
PE-150	—	—	—	—	—	—	120	421
Other	230	192	131	45	176	17	—	—
General Electric	324	83	14	25	32	489	260	207
CT-58	—	—	—	25	31	12	28	27
CJ-805	185	25	1	—	1	—	—	—
CF-700	—	—	—	—	—	122	150	130
CJ-610	—	—	—	—	—	—	—	50
CJ-610	—	—	—	—	—	355	82	—
Other	139	58	13	—	—	—	—	—
Lycoming	4,472	4,621	5,817	7,127	7,973	10,192	9,841	11,109
O-720/IO-720	—	—	—	152	43	71	27	17
O-541/TIO-541/TGIO-541	—	—	—	—	—	4	143	210
O-540/IO-540/TIO-540	728	1,194	2,070	2,749	2,969	3,429	2,507	2,885
O-480/GO-480/IGSO-480/GSO-480	122	142	169	121	204	221	203	181
O-435/GO-435/VO-435/TVO-435	12	7	206	230	405	506	344	307
O-360/IO-360/TIO-360/AIO-360	218	1,080	1,508	1,729	2,330	2,629	2,733	3,077
O-320/IO-320	1,128	1,248	1,578	2,068	1,942	3,098	3,673	4,055
O-290	17	17	13	11	11	9	6	8
O-235	1,241	289	264	67	62	222	205	369
Other	1,006	644	9	—	7	3	—	—
Pratt & Whitney	645	474	459	834	1,137	1,449	2,276	2,528
JT-3D	357	406	251	337	491	598	874	969
JT-12	97	44	38	87	151	167	157	156
JT-8D	—	3	165	410	435	684	1,244	1,401
JFT-10A	—	—	—	—	—	—	—	2
Other	191	21	5	—	—	—	1	—

NOTE: Included in the totals are: 1961, 22 by Allison and 92 by Curtiss Wright; 1962, 58 by Curtiss Wright; 1963, 96 by Curtiss Wright; 1964, 3 by Curtiss Wright.
Source: Aerospace Industries Association, company reports.

MILITARY AIRCRAFT ENGINE ACCEPTANCES
Calendar Years 1957 to Date
(Number of Engines)

ENGINE DESIGNATION	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
TOTAL	11,087	8,121	4,626	3,674	5,172	5,441	5,390	5,380	5,191	7,548
Jet	8,104	6,135	3,421	2,025	2,821	3,162	2,871	2,638	2,111	3,142
J-33	106	20	—	—	—	—	—	—	—	—
J-34	76	99	139	80	—	—	—	—	—	—
J-44	181	320	55	—	—	—	—	—	—	—
J-48	214	60	24	—	—	—	—	—	—	—
J-52	—	5	36	229	305	471	318	310	202	261
J-57	5,391	4,000	1,957	565	532	562	476	133	6	—
J-60	—	—	1	29	184	219	207	44	48	100
J-69	542	652	538	487	284	435	321	335	186	479
J-75	70	209	293	256	229	219	174	42	—	—
J-79	302	460	309	174	598	752	894	1,279	1,027	1,416
J-85	2	32	69	214	688	486	471	495	642	886
J-93	—	—	—	—	1	—	—	—	—	—
J-65	798	137	—	—	—	—	—	—	—	—
J-71	422	135	—	—	—	—	—	—	—	—
J-83	—	6	—	—	—	—	—	—	—	—
JT-3D	—	—	—	—	—	18	10	—	—	—
Turbo-Fan	—	—	—	168	683	298	76	195	392	631
TF-33	—	—	—	168	683	298	76	182	343	489
TF-30	—	—	—	—	—	—	—	13	49	142
Turbo-Prop	554	534	544	724	1,251	1,740	2,288	2,372	2,596	3,730
T-33	—	—	2	—	—	—	—	—	—	—
T-34	52	103	63	49	—	—	—	—	—	—
T-50	—	—	—	—	43	68	78	131	154	242
T-53	—	40	165	339	358	452	759	981	1,284	1,747
T-56	481	371	260	234	522	763	1,019	719	497	566
T-58	21	20	54	96	298	384	348	342	370	626
T-YT-55	—	—	—	—	30	73	68	138	228	394
T-64	—	—	—	—	—	1	16	61	63	155
Reciprocating	2,429	1,452	661	756	417	241	155	175	92	45
O-435	217	298	327	189	—	—	—	—	—	—
O-480	230	285	66	57	11	—	—	—	—	—
O-470	143	173	—	—	—	—	—	—	—	—
O-335	13	—	—	—	—	—	—	—	—	—
O-526	4	—	—	—	—	—	—	—	—	—
O-525	9	—	—	—	—	—	—	—	—	—
R-1340	7	22	—	—	—	—	—	—	—	—
R-1820	1,191	506	155	418	282	241	155	175	92	45
R-3350	198	87	113	93	124	—	—	—	—	—
R-1300	201	11	—	—	—	—	—	—	—	—
R-2800	216	70	—	—	—	—	—	—	—	—

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



MISSILE PROGRAMS

In terms of dollar value, the aerospace industry's production of guided missile systems gained slightly in 1968, and indications point to increased missile output in 1969.

A major factor in the indicated increase is continuing improvement of the U. S. long-range arsenal, involving replacement of earlier units of the submarine-launched fleet ballistic missiles and the silo-based ICBMs with more advanced versions. Other contributing factors include DoD's plan to deploy an operational anti-ballistic-missile system, retrofit programs designed to better performance of existing weapons and contemplated phase-out of some older missiles in favor of new systems.

Funding for missiles research and development continued at approximately the $2.5 billion per fiscal year level reached in 1967. FY 1968 expenditures for guided missile research, development, test and evaluation totaled $2.522 billion. Estimates for FY 1969 and 1970 were $2.485 billion and $2.436 billion respectively.

Sales of propulsion systems for missiles and space vehicles dropped $71 million in calendar year 1968, to a total of $907 million from 1967's

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	2,320	2,157
1967	2,877	3,121
1968	2,812	3,220

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

$978 million. The reduction was attributable to a sharp decline in sales of engines and parts for the civil space program; dollar volume fell off from $537 million in 1967 to $231 million in 1968. Military procurement of propulsion units climbed substantially, from 1967's $441 million to $676 million in 1968.

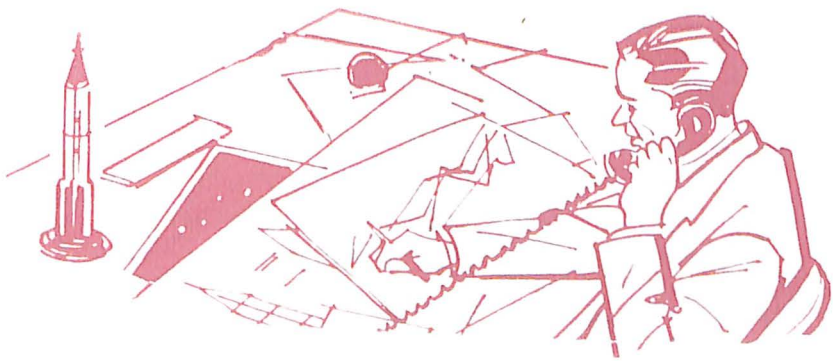
Highlighting the year's missile activity were a series of successful tests of the weapons components of the Sentinel/Safeguard ABM system, which employs the Spartan as the long-range member of the team and the Sprint as the high-acceleration unit designed for terminal intercept of incoming warheads. The latter, in flight status since 1965, progressed to a new stage of development with initiation of "fly-through" tests in which the missile blasts its way through the fiberglass lid of its launch cell, a technique designed to reduce reaction time. First flight tests of Spartan were conducted, beginning in April, 1968, at Kwajalein Test Range. Early in 1969, the new Administration altered the ABM deployment philosophy, reorienting Sentinel/Safeguard from a "thin" urban defense measure to a system designed primarily for protection of the U. S. ICBM retaliatory capability.

Considerable progress was achieved in the continuing upgrading of the U. S. long-range missile inventory with the replacement of additional

numbers of Minutemen II ICBMs and A3 Polaris fleet ballistic missiles, the most advanced operational members of their respective families. The year also saw the first successful test flights of even more advanced long-range systems, the Minuteman III and the Poseidon; both, coincidentally, made their initial flights on August 16, 1968. Minuteman III features a new re-entry system and an improved third-stage engine enabling delivery of heavier payloads than earlier models. Poseidon, scheduled to arm 31 of the 41 fleet ballistic missile submarines, has double the payload of A3 Polaris and is rated twice as accurate.

These other weapons passed milestones during the year:

- SRAM (Short-Range Attack Missile), an Air Force missile for air-launch against ground targets, entered flight test status.
- The USAF awarded a contract for development, test and production of Maverick, a TV-guided air-to-ground weapon.
- Plans were initiated by the Air Force for development of SCAD (Subsonic Cruise Armed Decoy), an air-to-ground system to be carried by the B-52 and the Advanced Manned Strategic Aircraft.
- Development was started on Viper, a USAF air-to-surface missile.
- The Army contracted for development of RAM, an air-launched version of the bazooka-like Redeye missile. Production rate for Redeye reached 1,000 missiles a month.
- SAM-D, an Army multiple-launch air defense system for field employment, reached advanced development status.
- Production testing started on Chaparral, a missile system designed to provide field units with a defense against low-flying aircraft.
- Development was initiated on ZAP, an unguided anti-aircraft weapon.
- First firings with manned guidance were successfully conducted on Dragon, a shoulder-launched missile designed for use against armor and field fortifications.



Sales of missile systems, excluding propulsion units and parts, totaled $2.81 billion in 1968, down from 1967's $2.87 billion. Backlog at year-end, however, reached the highest point in the decade of the sixties at $3.22 billion. This represented a boost of $100 million over the backlog on December 31, 1967, and an increase of more than $1 billion over the 1966 figure.

The trend toward greater missile production in 1969 was evidenced by Department of Defense estimates of expenditures for the fiscal years 1969 and 1970. For the year ending June 30, 1969, DoD estimated procurement funding of $2.879 billion, while the FY 1970 plan forecast expenditures of $3.226 billion. These amounts compare with $2.219 billion in FY 1968.

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[E]	2,879	1,470	787	622
1970[E]	3,226	1,650	741	835

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 619, January 13, 1969, 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[E]	5,364	2,879	2,485
1970[E]	5,662	3,226	2,436

Note: Does not include military assistance.
[E] Estimate
Source: Department of Defense, Reports "FAD 619, 620", January 13, 1969.

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

Note: Based on data from about 60 companies engaged in the manufacture of aerospace products The figures are inflated by the inclusion of subcontracts.
N.A.—Not available.
[a] Data included in totals for space vehicle 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/Rocketdyne	—	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
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	USN	General Dynamics	Aerojet	—	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/Rocketdyne	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/Rocketdyne		Philco/Raytheon	Operational
Sparrow 3	USN	Raytheon	NAR/Rocketdyne	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
Teton	Army	Aerojet	Aerojet		Aerojet	Development
Walleye	USN	Martin Marietta/ Hughes		Glide Bomb	Martin Marietta	Operational

MAJOR MISSILES IN DEVELOPMENT OR PRODUCTION—*Continued*

Project	Service	Systems Contractor	Propulsion		Guidance Mfr.	Status
			Manufacturer	Type		
BATTLEFIELD SUPPORT GUIDED MISSILES						
Lance	Army	LTV	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	Martin Marietta	Thiokol			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

Source: Air Force Systems Command.

SPACE PROGRAMS

Estimates of government expenditures for space programs in Fiscal Year 1969 indicated a decline of more than $300 million from the previous year's level. The drop was primarily attributable to reduced costs of space vehicles and equipment for the National Aeronautics and Space Administration's Apollo project, which peaked in 1966 and declined in each succeeding year.

Overall expenditures for FY 1969 were estimated at $6.343 billion. This is broken down into $4.097 billion for NASA, $2.095 billion for the Department of Defense, $117 million for the Atomic Energy Commission and $34 million spread among other government agencies. The NASA total is down more than half a billion dollars from FY 1968. The AEC and other agency figures represent slight reductions. Military space funding, however, continued to spiral upward, as it has in every year of the Space Age. The estimate for FY 1969 is more than $200 million above the 1968 expenditure.

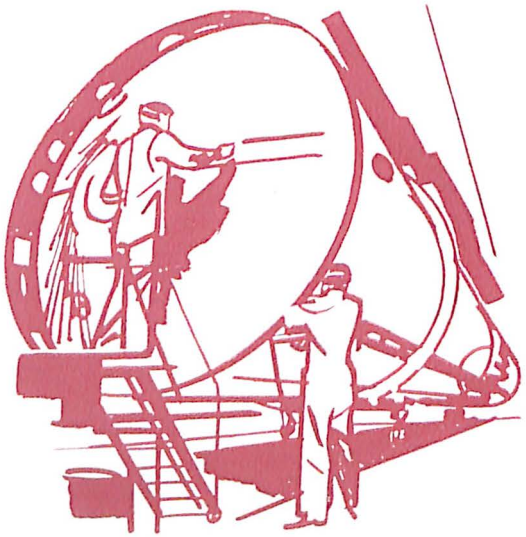
A further decline in overall funding was indicated for FY 1970. Estimates for that year showed a general reduction of another $200 million-plus, despite an increase in military expenditures of $80 million.

Within the NASA budget, manned space flight continued to dominate funding. Despite the drop in Apollo monetary requirements, funding for manned space operations was expected to remain above the $2 billion level in fiscal 1969. Indications were that it would remain close to that level in FY 1970.

By year-end 1968, the U.S. had launched 575 successful earth satellites, including both NASA and military spacecraft. In addition, the number of payloads successfully launched into escape trajectories—lunar, planetary or solar orbit spacecraft—reached a total of 31. The U.S. launched 61 earth-orbiting spacecraft and three escape payloads in 1968, compared with 77 and 10 respectively in 1967.

In 1968, NASA's momentum-gaining Apollo program reached a major milestone with the epochal flight of Apollo 8 on which astronauts Frank Borman, James A. Lovell, Jr. and William A. Anders flew 240,000 miles to the moon, made 10 revolutions of the moon, and returned safely to earth. Apollo 8 was preceded by three other 1968 missions: Apollo 5, an unmanned first test of the Lunar Module in space; Apollo 6, primarily a test of the Saturn V launch vehicle; and Apollo 7, the first manned Apollo flight, crewed by astronauts Walter M. Schirra, Jr., Donn F. Eisele and Walter Cunningham.

In other NASA manned space flight activity, the agency entered the hardware fabrication phase of the follow-on Apollo Applications Program. NASA contemplated three Apollo Applications long-duration earth-orbit missions involving a total of five launches. The missions, to range from 28 to 56 days, include the Saturn I Workshop, in which an S-IVB stage will be employed as an interim space station for manned experiments; the



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

	Fiscal Years Ending June 30		
	1968	1969	1970
TOTAL	$3,967	$3,193	$3,169
MANNED SPACE FLIGHT—			
TOTAL	2,809	2,177	2,008
Apollo	2,556	2,025	1,651
Space flight operations	253	150	354
Advanced missions	—	2	3
SPACE SCIENCE AND APPLICATIONS—TOTAL	553	438	559
Physics and astronomy	140	125	120
Lunar and planetary exploration	148	82	147
Bioscience	42	33	32
Space applications	99	98	136
Launch vehicle procurement	124	100	124
ADVANCED RESEARCH AND TECHNOLOGY—TOTAL	315	285	290
Basic research	21	21	21
Space vehicle systems	34	32	30
Electronics systems	38	35	35
Human factor systems	20	19	24
Space power and electric propulsion systems	44	42	40
Nuclear rockets	54	32	36
Chemical propulsion	37	29	25
Aeronautical vehicles	67	75	79
TRACKING AND DATA ACQUISITION—TOTAL	276	280	298
UNIVERSITY AFFAIRS—TOTAL	10	9	9
Sustaining university program	10	9	9
TECHNOLOGY UTILIZATION—			
TOTAL	4	4	5

Note: Administrative operations costs for NASA are not included.
Source: National Aeronautics and Space Administration Briefing on the Budget of the United States, January, 1969.

Saturn I Workshop Revisit, in which a second crew will rendezvous with the Workshop after several months of untended storage in orbit; and the Solar Astronomy Mission, in which modified Apollo hardware will be used as a manned solar observatory. First AAP launch is scheduled for late 1971 or early 1972.

During the year, NASA also continued its study effort toward development of a semi-permanent 12-man space station, to be operational in the mid-1970s. First assignment of contractors for definition studies was planned for 1969.

The unmanned portion of NASA's program was highlighted in 1968 by the first successful flight of the 4,400-pound Orbiting Astronomical Observatory, largest U.S. unmanned spacecraft. Also launched during the year were the fifth Orbiting Geophysical Observatory; the Pioneer 9 interplanetary explorer; the seventh and last of the Surveyor moon-lander series; and the first Radio Astronomy Explorer. For the Environmental Science Services Administration, NASA launched the ESSA 7 and 8 operational meteorological satellites.

The major military space project of the year involved the launch into high-altitude orbit of eight additional Comsats of the Initial Defense Satellite Communications System. This brought to 25 the number of satellites in the system and completed the IDSCS network. In developmental status during the year were advanced systems for both global communications and the specialized needs of a tactical Comsat network.

In addition to launching eight scientific satellites and approximately a score of classified payloads, the Department of Defense continued to operate its satellite navigation and geodetic systems, although no new space-

SPACECRAFT LAUNCHINGS AS OF APRIL 3, 1967

Country	TOTAL	Payloads in Earth Orbit	Payloads Decayed	Space Probes
TOTAL	851	323	500	28
United States	547	257	276	14
U.S.S.R.	291	57	220	14
U.S./Canada	2	2	—	—
U.S./U.K.	3	2	1	—
France	5	5	—	—
Italy	2	—	2	—
U.S./Australia	1	—	1	—

Source: National Aeronautics and Space Administration.

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	—
TOTAL	575	100	31	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.
[a] Failed to go to escape as intended, but did attain earth orbit.
Source: National Aeronautics and Space Administration, "Report to the Congress from the President of the United States" (Annually).

craft were added to either network. The only DoD manned space program, the Manned Orbiting Laboratory, continued in hardware development status toward first launch in 1972.

AEC's 1969 space effort focused on ground testing of the Phoebus series of reactors, part of a joint AEC/NASA program for development of a nuclear-powered rocket stage. Also in conjunction with NASA, AEC was conducting design and test work on nuclear generators for spacecraft power.

Other agencies participating in the space program in 1968 included the Environmental Science Services Administration of the Department of Commerce, which operated the ESSA weather satellite network and conducted studies of future meteorological systems; the Department of the Interior, working in concert with NASA toward development of earth resources observation spacecraft; and the National Science Foundation.

CHRONOLOGY OF MANNED SPACE FLIGHTS

Launch Date	Project	Pilot	Nation	Duration
Suborbital				
May 5, 1961	Mercury-Redstone 3	Alan Shepard	USA	302 miles
July 21, 1961	Mercury-Redstone 4	Virgil Grissom	USA	303 miles
Orbital				
April 12, 1961	Vostok 1	Yuri Gagarin	USSR	1 hr. 40 min.
Aug 6, 1961	Vostok 2	Gherman Titov	USSR	25 hr. 18 min.
Feb 20, 1962	Mercury-Atlas 6	John Glenn.	USA	4 hr. 45 min.
May 24, 1962	Mercury-Atlas 7	Scott Carpenter	USA	4 hr. 56 min.
Aug 11, 1962	Vostok 3	Andreyan Nikolayev	USSR	94 hr. 22 min.
Aug 12, 1962	Vostok 4	Pavel Popovich	USSR	70 hr. 57 min.
Oct 3, 1962	Mercury-Atlas 8	Walter Schirra, Jr.	USA	8 hr. 13 min.
May 15, 1963	Mercury-Atlas 9	Gordon Cooper	USA	34 hr. 20 min.
June 14, 1963	Vostok V	Valery Byovsky	USSR	119 hr. 6 min.
June 16, 1963	Vostok VI	Valentina Tereshkova	USSR	70 hr. 50 min.
Oct 12, 1964	Voskhod I	Vladimir M. Komarov Konstantin Feoktistiv Boris B. Yegorov	USSR	24 hr. 17 min.
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.

[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

Date	Designation	Purpose
1968		
Jan 7	Surveyor VII	Lunar Photography and Surface Studies
Jan 11	Explorer XXXVI	Geodetic Studies
Jan 22	Apollo V	Lunar Module Checkout
Mar 4	OGO V	Earth-Sun Data
Mar 5	Explorer XXXVII	Solar Radiation
Apr 4	Apollo VI	Man Rate Saturn V
Apr 27	Reentry VI	Reentry Heating Test
May 17	ESRO 1IS	Radiation
May 18	Nimbus 8	Meteorology
Jul 4	Explorer XXXVIII	Radio Astronomy
Aug 8	Explorer XXXIX Explorer XL	Interdisciplinary project to continue the detailed scientific study of density and radiation characteristics of earth's upper atmosphere at a time of high solar activity.
Aug 10	ATS IV	Application and Technology. To perform communication, meteorological, technology, and science experiments.
Aug 16	ESSA VII	Meteorology
Aug 22	RAM C II	To measure electron and ion concentrations in the flow field at discrete spacecraft locations during reentry.
Sep 19	Intelsat III F-1	Communications. Third generation Comsat commercial satellite.
Oct 3	Aurorae (ESRO-1)	Carried eight experiments designed to perform an integrated study of the high latitude ionosphere.
Oct 11	Apollo VII	Manned operations; Walter M. Schirra, Donn F. Eisele and Walter Cunningham. Eight successful service propulsion firings.
Nov 8	Pioneer IX	To collect scientific data on the electromagnetic and plasma properties of the interplanetary medium for a period covering six or more passages of solar activity centers.
Dec 5	HEOS-A	First NASA/ESRO reimbursable mission. Scientific satellite for the investigation of interplanetary magnetic fields and the study of solar and cosmic ray particles.
Dec 7	OAO II (A2)	Astronomy. Heaviest, most complex U.S. scientific spacecraft built to be unmanned
Dec 15	ESSA VIII	Meteorology
Dec 18	Intelsat III F-2	Communications
Dec 21	Apollo VIII	First manned Saturn V flight. Frank Borman, James A. Lovell, Jr. and William A. Anders, demonstrated crew, space vehicle and mission support facilities performance during a manned lunar orbital mission.
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.

NOTE: For data for earlier years, see earlier 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.

UNITED STATES SPACE LAUNCH VEHICLES

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

(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[E]	4,250	3,520	70	660
1970[E]	3,950	3,235	60	655

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

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

Year Ending June 30	TOTAL	National Aeronautics and Space Administration[a]	Department of Defense[b]	Atomic Energy Commission	Other
1955	[1]$ 75	$ 74	$ 1	N.A.	—
1956	100	71	17	N.A.	$12
1957	150	76	48	N.A.	26
1958	249	89	136	N.A.	24
1959	521	146	341	N.A.	34
1960	960	401	518	N.A.	41
1961	1,518	744	710	N.A.	64
1962	2,418	1,257	1,029	130	2
1963	4,114	2,552	1,368	181	13
1964	5,970	4,171	1,564	220	15
1965	6,886	5,035	1,592	232	27
1966	7,719	5,858	1,638	188	35
1967	7,237	5,337	1,673	184	43
1968	6,667	4,595	1,890	146	36
1969[E]	6,343	4,097	2,095	117	34
1970[E]	6,116	3,791	2,175	108	42

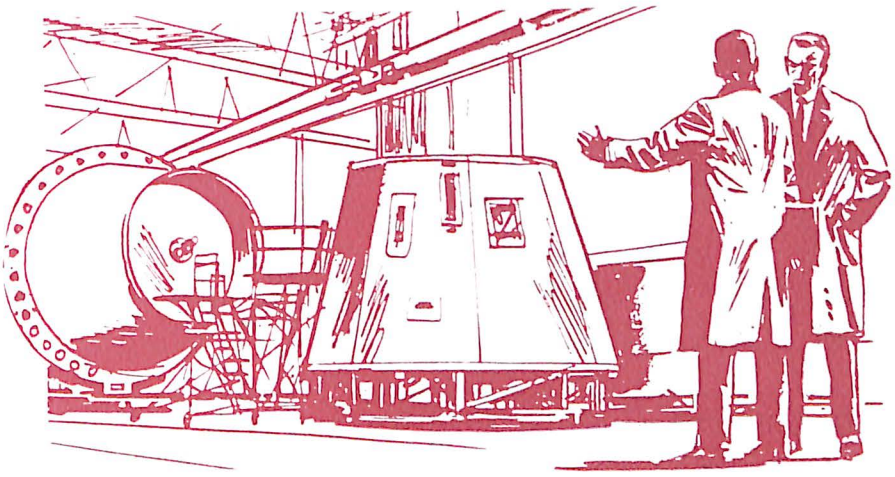
NOTE: Most of the activities of the National Aeronautics and Space Administration are classified as Research and Development. See chapter on Research and Development for additional tables.

[E] Estimate.

[a] Excludes amount for aircraft technology beginning with 1965.

[b] This includes the astronautics budget activity and other activities which contribute to the space effort.

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



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

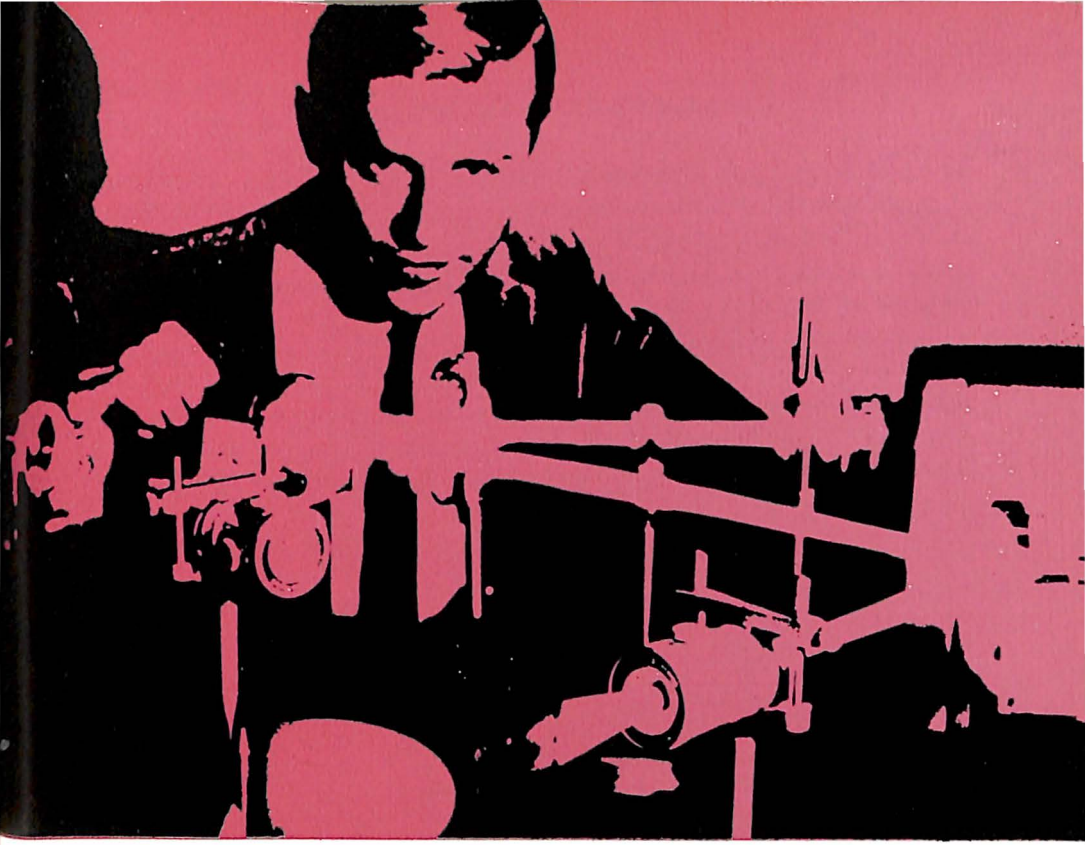
Year Ending December 31	Net Sales During Year			Backlog, December 31		
	TOTAL	Military[a]	Non-military	TOTAL	Military[a]	Non-military
1961	$ 775	$ 551	$ 224[a]	$ 596	$ 350	$ 236[a]
1962	1,319	712	607[a]	1,415	852	583[a]
1963	1,911	1,061	850	1,612	856	756
1964	2,222	732	1,490	1,611	391	1,220
1965	2,449	602	1,847	2,203	503	1,700
1966	2,710	734	1,967	1,494	428	1,066
1967	2,198	789	1,409	1,974	1,096	878
1968	2,318	860	1,458	1,329	834	495

NOTE: Based on data from about 60 companies engaged in the manufacture of aerospace products.
[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

Source: National Aeronautics and Space Administration.



RESEARCH AND DEVELOPMENT

U.S. government funding for research and development in Fiscal Year 1969 fell off only slightly from the all-time peak of 1968. Estimates indicate expenditures of $16.425 billion in FY 1969, compared with $16.865 billion in 1968. It appeared that R&D funding would show a modest gain in FY 1970, to an estimated total of $16.7 billion.

It was expected that the aerospace portion of the government-funded R&D program would amount to approximately $9 billion. FY 1969 estimates for the two major sponsors of aerospace R&D included $4.61 billion to be expended by the Department of Defense and $4.25 billion by NASA, a total of $8.86 billion. The aggregate allocations for the Atomic Energy Commission, the Federal Aviation Administration and other government agencies engaged in aerospace R&D are estimated at an additional $200 million-plus. The total needs some qualification, however, since budget accounts list all NASA expenditures as research and development. Actually, the $4.25 billion for NASA includes $730 million for construction of facilities and administrative operations which should properly be excluded from the R&D account (for breakdown, see Space Programs).

Precise data as to the amounts involved in government-sponsored

industrial R&D—that contracted to aerospace industry firms—were not available at publication time. However, it appeared a valid assumption—since overall funding remained near-constant—that industrial R&D would continue at about the $4.5 billion level; it has hovered at or near that total for the past several years.

In addition to government expenditures, it is estimated that approximately another billion dollars would be spent by aerospace industry companies for research and development in 1968. Mounting performance and complexity of modern defense and space systems demands that industry firms divert ever-increasing amounts of their earnings to in-house R&D in

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[r]	14,694	7,517	4,171	1,505	1,501
1965[r]	14,875	6,728	5,093	1,520	1,534
1966[r]	16,002	6,735	5,933	1,462	1,872
1967[r]	16,842	7,680	5,426	1,467	2,269
1968[r]	16,865	8,148	4,724	1,593	2,400
1969[E]	16,425	8,036	4,250	1,668	2,471
1970[E]	16,700	8,254	3,950	1,721	2,775

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

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[E]	7,545	3,400	2,070	1,600	475
1970[E]	7,805	3,476	2,150	1,670	509

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 620", January 13, 1969.

order to remain competitive. The industry total for company-financed R&D topped the billion dollar level in 1967.

The spectrum of aerospace research and development conducted by the Department of Defense is very broad. The program can be generally subdivided into aircraft, missiles and astronautics projects. In the field of aircraft research and development, highlights of the calendar year 1968 included initial flight testing and deliveries of prototypes of the USAF's C-5A Galaxy heavy logistics transport; the first flight of the P-3C Orion, the Navy's advanced submarine spotter; the start of testing of the EA-6B Navy tactical countermeasure aircraft; the emergence from development to

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[E]	7,545	4,617	946	2,485	1,186	2,928
1970[E]	7,805	4,785	1,202	2,436	1,147	3,020

[E] Estimate.
Source: Department of Defense, Report "FAD 620", January 13, 1969.

production status of the FB-111A strategic bomber; and advanced testing for the Army's AH-56A Cheyenne compound helicopter.

Missiles introduced to flight test status during the year included the Navy's Poseidon fleet ballistic missile; the Air Force's Minuteman III silo-based ICBM; Spartan, long-range member of the Army's Sentinel/Safeguard ABM system; SRAM (Short Range Attack Missile), a USAF air-to-surface weapon; and Dragon, a shoulder-fired missile for Army field use.

The major military astronautics project, the USAF's Manned Orbiting Laboratory, continued through 1968 in hardware development status with initial launch scheduled for 1972. Also in development were new members of the Titan III launch vehicle family and advanced satellite communications systems designed specifically for military requirements.

Highlights of NASA's R&D program in 1968 included four flights of Apollo spacecraft, foremost among them the dramatic lunar orbit mission of Apollo 8. Earlier in the year NASA flew Apollo 5, an unmanned first test of the Lunar Module in space; Apollo 6, a check out of the Saturn V vehicle and its compatability with the Apollo spacecraft; and Apollo 7, a

264-hour earth orbital mission which marked the first manned flight in the Apollo program. Apollo 9 and 10 in 1969 set the stage for a landing on the moon.

In addition to Apollo, NASA conducted a number of other important operations of unmanned spacecraft, among them the lunar landing and successful performance of Surveyor 7, last of the series; the first successful launch of the Orbiting Astronomical Observatory; the launch of the fifth in the series of Orbiting Geophysical Observatories; the successful injection into interplanetary orbit of Pioneer 9; and the launch of the first of a series of Radio Astronomy Explorers.

The principal aerospace R&D project of the Atomic Energy Commission during 1968 was work on the Phoebus series of reactors for nuclear-powered rockets. The Phoebus tests were part of the joint AEC-NASA

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[r]	15,548	5,448	4,695	756
1967	16,420	5,568	4,510	1,058

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.

Rover program aimed at eventual development of a nuclear-powered upper stage for space launch vehicles. AEC was also working with NASA on SNAP nuclear generators to be used as power sources for future spacecraft. In the non-classified area of AEC work for the military services, the agency was testing a plutonium-238 powered water recovery system for use aboard long-duration spacecraft.

Other government agencies performing aerospace R&D included the National Science Foundation and the Departments of Commerce (weather satellites), Interior (earth resources satellite studies) and Transportation. Within the latter agency, the Federal Aviation Administration was supervising the national supersonic transport development program and conducting research in such areas as air navigation and terminal equipment, all-weather landing systems, collision avoidance systems, new types of fuel, fog dispersal, runway improvement, improved weather forecasting and aeromedical applications.

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

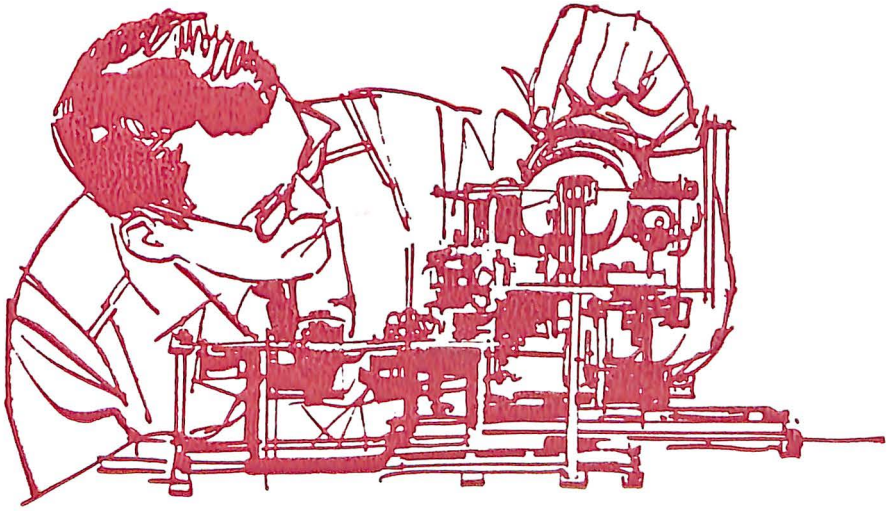
Year Ending December 31	Total Aerospace	Applied Research and Development Funds			Basic Research Funds		
		Total	Federal Government	Company	Total	Federal Government	Company
1957	$2,574	$2,549	N.A.	N.A.	$25	N.A.	N.A.
1958	2,609	2,583	$2,266	$317	26	$10	$16
1959	3,090	3,058	2,733	325	32	18	15
1960	3,514	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[a]	588[a]	70	40[a]	30[a]
1966	5,448	5,380	4,656	724	68	36	32
1967	5,568	5,497	4,477	1,021	71	33	37

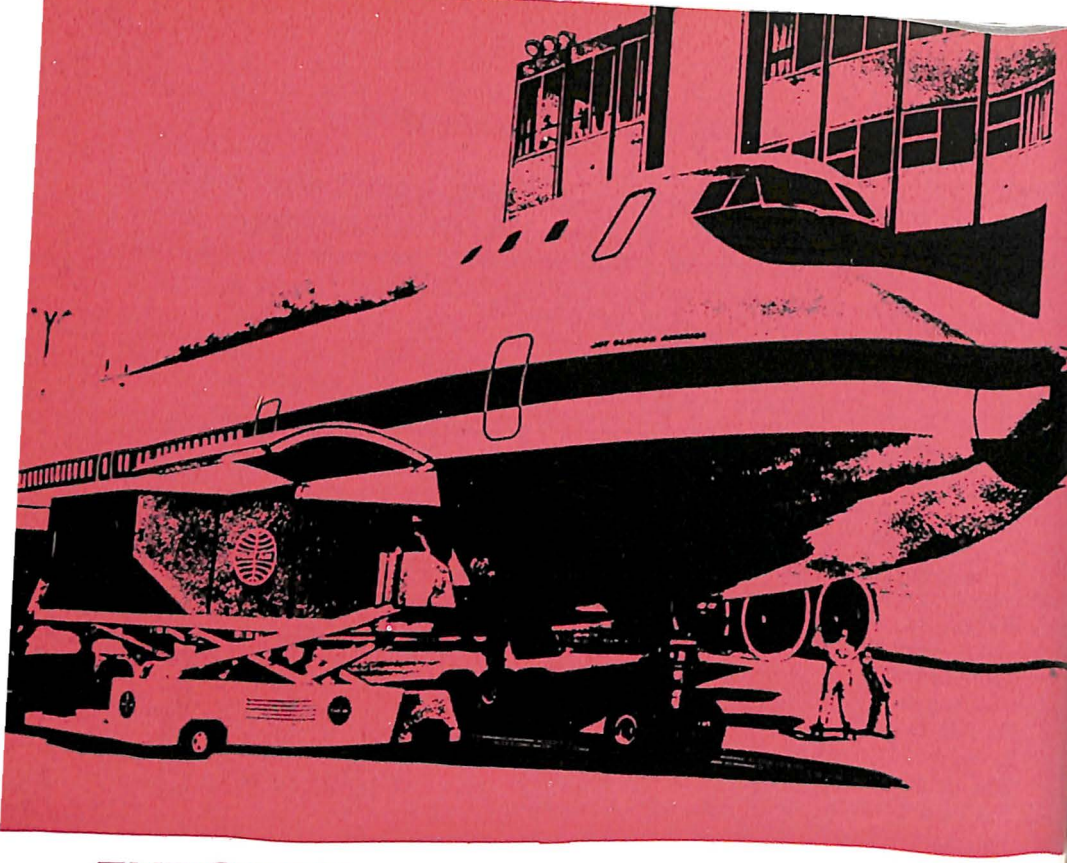
N.A.—Not available.
[r] Revised.
[a] Estimated by the National Science Foundation. Revised data not collected.
Source: National Science Foundation, Aerospace Industries Association.

RESEARCH AND DEVELOPMENT EXPENDITURES
(Other than Department of Defense, National Aeronautics and Space Administration and Atomic Energy Commission)
FISCAL YEARS 1968 to 1970
(Millions of Dollars)

DEPARTMENT OR AGENCY	Actual	Estimate	
	Years ending June 30		
	1968	1969	1970
TOTAL	$2,226	$2,287	$2,576
Agriculture	263	266	275
Commerce	76	78	86
Health, Education and Welfare	1,192	1,125	1,249
Interior	174	200	212
Transportation	105	153	220
National Science Foundation	248	270	293
Veterans Administration	44	48	59
Other	124	147	182

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).





EXPORTS

Aerospace exports continued an upward swing begun in 1965 to reach a new high of nearly $3 billion in 1968. This is 33 percent higher than 1967 and more than double total industry exports a decade ago. Exports represented about 10 percent of the industry's total sales in 1968 further bolstering its reputation as the nation's largest manufacturing exporter.

In addition, aerospace exports strengthened the U. S. trade balance substantially by contributing more than two and one-half times the total merchandise trade balance in 1968. The aerospace trade balance was more than $600 million higher than in 1967 rising to $2.6 billion.

Increasingly, the major portion of total aerospace exports has been civilian. Over the past 11 years, civilian exports have increased, and by 1968 they reached 74 percent of the total. In 1968 foreign airlines, industry and private citizens purchased a total of $2.2 billion of U. S. aircraft, engines and accessory equipment.

The U. S. aerospace industry supplied 73 percent of the transport aircraft in use on free world airlines during the year. Also, the availability of short-range jet transports in 1968 had a great impact on the export market during the year as foreign airlines rushed to accept delivery of these aircraft.

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	990	2,623	2,995	372	264.9

NOTE: U. S. Balance of trade is the difference between exports of domestic merchandise and imports for consumption.
Sources: U. S. Department of Commerce, Bureau of the Census: "U. S. Exports of Domestic Merchandise, Schedule B, Commodity by Country of Destination;" "U. S. Imports of Merchandise for Consumption;" "Highlights of U. S. Export and Import Trade;" (All are monthly publications).

Commercial transport exports nearly doubled during the year compared to 1967 as 240 aircraft valued at $1.2 billion were shipped to foreign buyers.

Export of general aviation aircraft declined slightly from 3,125 in 1967 to 2,879 in 1968 although the value of such exports jumped to $101 million in 1968 compared to $91 million in 1967.

The industry exported 219 commercial helicopters during the year, one less than the year previous. Value of the 1968 helicopter shipments were $26.5 million.

Military aircraft exports accounted for $409 million of total exports, up from $324 million in 1967. These included military transports, helicopters, fighters, bombers and general aviation aircraft. The most significant increase was in fighters and bombers which jumped from $115 million in 1967 to $279 million in 1968.

Aerospace imports edged higher totalling $372 million during 1968 compared to $287 million in 1967.

The U.S. Export-Import Bank reported gross authorizations of credits and guarantees supporting commercial aircraft exports totalling $400.4 million for 1968, $386.8 million of which represented jet transports. Credits, commitments of direct financing by the Bank of aircraft exports, totaled $336.8 million for the year while guarantees of principal and interest on loans made by other lending institutions amounted to $63.6 million for the year.

EXPORTS OF U. S. AEROSPACE PRODUCTS
Calendar Years 1958 to Date
(Millions of Dollars)

	Years Ending Dec. 31		
	1958	1959	1960
GRAND TOTAL	1,316.0r	1,059.1r	1,726.1
TOTAL MILITARY	712.4	556.7	637.4
COMPLETE AIRCRAFT, TOTAL	267.4	122.7	219.4
Transports	32.0	9.7	20.8
General Aviation	6.8	4.0	3.9
Rotary	19.2	17.9	10.8
Fighters & Bombers	193.6	73.9	177.9
Trainers	15.8	14.1	5.5
Other, including Used	0.01	3.1	0.5
ENGINES, TOTAL	29.1	20.5	12.8
Jet & Gas Turbine	0.9	2.5	3.5
Missile Turbine	—	—	—
Internal Combustion	28.2	18.0	9.3
PARTS, ACCESSORIES & EQUIPMENT INCLUDING SPARES, TOTAL	379.7	290.7	291.4
Engine Spares & Accessories	70.2	79.1	57.6
Other Spares & Equipment	309.5	211.6	233.8
ROCKETS, GUIDED MISSILES & PARTS, TOTAL	36.2	122.8	113.8
Complete Rockets & Guided Missiles	23.9	100.3	83.4
Parts & Accessories for Rockets & Guided Missiles	12.3	22.5	30.4
TOTAL, CIVILIAN	603.6r	502.4r	1,088.7
COMPLETE AIRCRAFT, TOTAL	204.7r	152.8r	537.1
Transports, New	147.2r	107.6r	480.1
General Aviation, New	12.1	14.4	23.6
Rotary Wing, New	9.5	8.1	7.7
Other, including Used	35.9	22.7	25.7
ENGINES, TOTAL, NEW AND USED	48.3	43.7	70.7
Jet & Gas Turbine	8.0	18.6	47.5
Internal Combustion	40.3	25.1	23.2
PARTS, ACCESSORIES & EQUIPMENT FOR AIRCRAFT AND ENGINES, INCLUDING SPARES, TOTAL	350.6	205.9	480.9
Engine Spares & Accessories	70.5	69.3	101.1
Other Spares & Equipment	280.1	236.6	379.8

EXPORTS OF U. S. AEROSPACE PRODUCTS—*Continued*
1958 to Date
(Millions of Dollars)

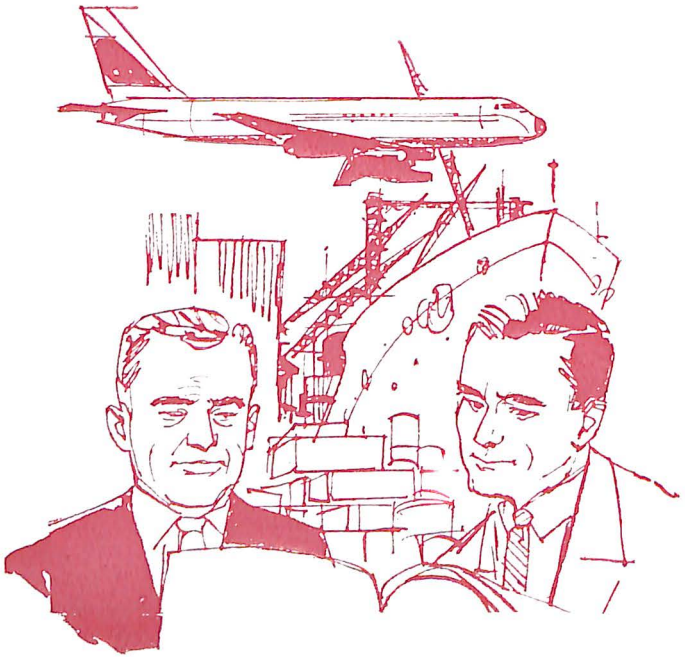
Years Ending December 31							
1961	1962	1963	1964	1965	1966	1967	1968
1,652.8	1,923.0	1,627.0	1,607.9	1,618.1	1,672.6	2,248.1	2,994.9
774.8r	1,013.2	895.1	844.1	763.6	637.5	867.6	767.4
246.1	310.6	226.7	241.4	304.1	221.7	323.8	409.4
30.5	14.0	52.0	66.1	63.6	43.6	130.6	100.6
1.6	1.6	3.6	1.6	2.1	1.6	1.2	0.6
7.7	28.9	48.6	31.0	23.3	17.4	30.0	9.8
191.3	214.6	81.5	120.2	156.6	107.6	115.2	278.6
13.8	50.6	40.8	19.7	57.1	31.8	15.1	11.5
1.2	0.9	0.2	2.8	1.4	19.7	31.7	8.3
17.9	19.2	34.6	30.0	30.1	31.2	26.4	31.5
12.2	14.3	26.8	24.9	22.1	19.8	18.8	24.2
—	—	—	—	5.1	4.1	2.4	3.0
5.7	4.9	7.8	5.1	2.9	7.3	5.2	4.3
413.2	578.3	541.1	475.4	287.6	250.4	308.8	192.8
92.0	125.1	123.8	97.0	83.4	72.7	83.8	41.9
321.2	453.2	417.3	378.4	204.2	177.7	225.0	150.9
97.6	105.1	92.7	97.3	141.8	134.2	208.6	133.7
62.4	36.2	13.7	14.1	12.6	13.3	34.0	41.6
35.2	68.9	79.0	83.2	129.2	120.9	174.6	92.1
878.0	909.8	731.9	763.8	854.5	1,035.1	1,380.5	2,227.5
334.5	327.8	244.1	287.1	477.2	552.4	789.3	1,403.9
262.5	259.2	190.9	211.1	352.8	420.8	611.4	1,200.1
27.5	23.1	26.9	33.3	68.8	89.1	91.2	101.3
6.9	8.8	9.8	14.6	16.2	11.6	25.3	33.0
37.9	36.7	16.5	28.1	39.4	30.9	61.4	69.5
75.3	63.0	45.1	46.7	56.2	77.0	101.2	115.9
53.6	44.8	25.7	25.0	38.8	49.3	69.6	92.4
21.7	18.2	19.4	21.7	17.4	27.7	31.6	23.5
467.9	519.0	442.7	430.0	321.1	405.7	490.0	707.7
104.2	112.2	101.3	87.7	92.6	116.9	132.1	191.0
363.7	406.8	341.4	342.3	228.5	288.8	357.9	516.7

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

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	143.7	26	40.1	39	103.6
1960	159	480.1	67	15.8	92	464.3
1961	119	262.5	68	11.2	51	251.3
1962	172	259.2	122	13.8	50	245.4
1963	181	190.9	151	18.1	30	172.8
1964	225	211.1	193	29.1	32	182.0
1965	76	351.8	16	4.9	60	346.9
1966	82	420.8	6	0.1	76	420.7
1967	134	611.4	13	4.4	121	607.0
1968	240	1,200.1	19	10.0	221	1,190.1

Source: Bureau of the Census, "U. S. Exports of Domestic Merchandise, Schedule B, Commodity by Country of Destination," 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
1968....	2,879	101.3	2,284	36.1	163	8.5	432	56.7

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

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

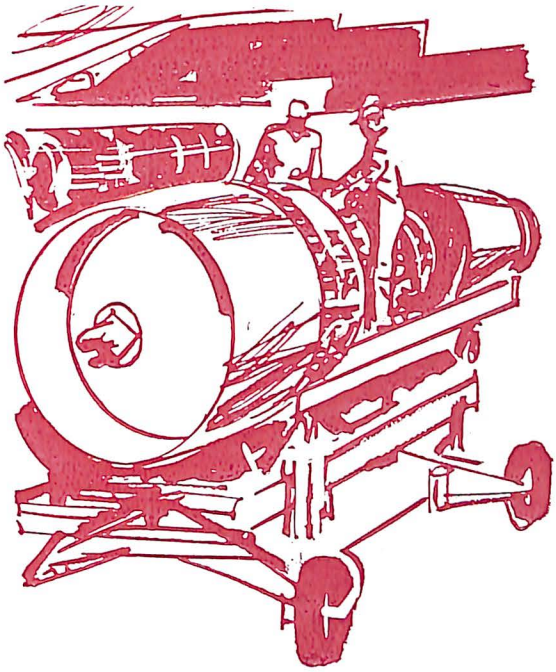
Year Ending December 31	Number	Value[a] (Thousands of Dollars)
1960	1,481	$27,312.6
1961	1,583	29,789.8
1962	1,458	30,938.7
1963	1,579	35,060.6
1964	1,775	44,118.4
1965	2,242	59,596.1
1966	2,903	75,373.3
1967	3,035	76,540.9
1968	2,803	91,448.1

[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 1968

Total and Destination	Number	Value[a] (Thousands of Dollars)
TOTAL	2,803	$91,448.1
Canada	377	9,197.6
Latin America	787	30,731.3
Europe	862	27,148.5
Asia	159	6,555.6
Oceania	251	6,996.4
Africa	367	10,818.7

[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.



U. S. Exports of
New and Used Civil Aircraft Engines
Calendar Years 1958 to Date
(Value in Millions of Dollars)

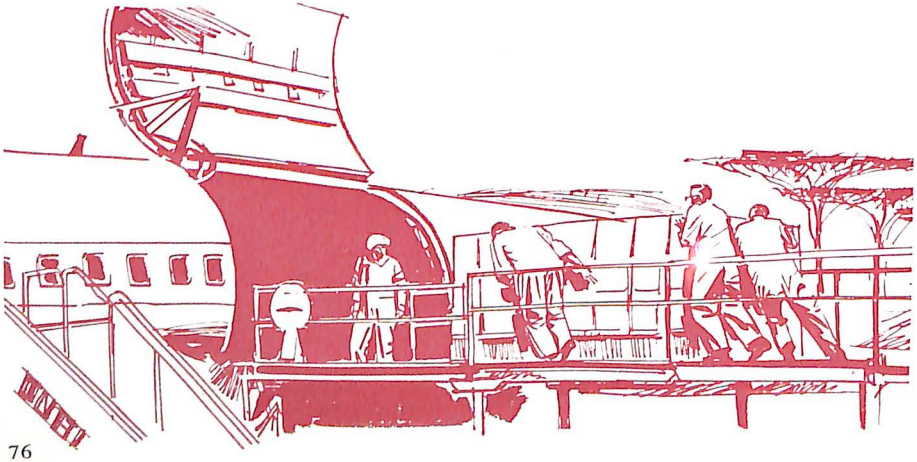
Year	Total		Jet and Gas Turbine		Internal Combustion	
	Number	Value	Number	Value	Number	Value
1958	3,904	$ 48.3	61	$ 8.0	3,843	$ 40.3
1959	2,900	43.7	313	18.6	2,587	25.1
1960	3,725	70.7	480	47.5	3,245	23.2
1961	3,630	75.3	364	53.6	3,276	21.7
1962	3,690	63.1	341	44.8	3,349	18.2
1963	3,143	45.1	253	25.7	2,890	19.4
1964	4,062	46.7	247	25.0	3,815	21.7
1965	3,330	56.2	372	38.8	2,958	17.4
1966	4,006	77.0	564	49.3	3,442	27.7
1967	4,236	101.2	756	69.6	3,480	31.6
1968	3,280	115.9	865	92.4	2,415	23.5

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

U. S. EXPORTS OF NEW SMALL AIRCRAFT ENGINES[a] FOR CIVILIAN AIRCRAFT
Calendar Years 1948 to 1964

Year Ending December 31	Number	Value (Thousands of dollars)
1948	660	$ 326
1949	107	112
1950	247	285
1951	304	509
1952	551	941
1953	347	708
1954	728	1,516
1955	897	2,016
1956	1,371	3,529
1957	1,516	3,860
1958	1,552	4,312
1959	948	2,448
1960	1,464	3,716
1961	1,575	4,399
1962	1,819	4,510
1963	1,292	3,635
1964	1,677	5,257
1965	1,491	4,815
1966	1,714	6,726
1967	1,748	6,816
1968	1,176	7,156

[a] 1948 and 1949, under 250 h.p.; 1950–1964, under 400 h.p.; 1965 to date, under 500 h.p.
Source: Bureau of the Census, "U. S. Exports of Domestic Merchandise, Schedule B, Commodity by Country of Destination", Report FT 410 (Monthly).



EXPORTS

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

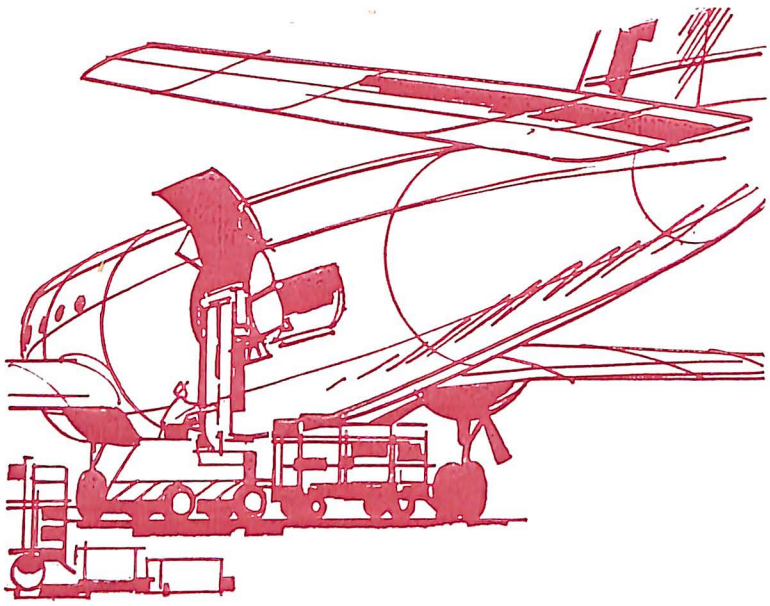
Year	TOTAL	Internal Combustion			Jet and Gas Turbine			Missile Engines and Parts
		Total	Engines	Parts	Total	Engines	Parts	
1958	$213.5	$204.6	$68.5	$136.1	$ 8.9	$ 8.9	N.A.	N.A.
1959	208.0	186.9	43.1	143.8	21.1	21.1	N.A.	N.A.
1960	235.1	184.1	32.5	151.6	51.0	51.0	N.A.	N.A.
1961	279.8	214.0	27.4	186.6	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	380.2	149.4	27.7	121.7	227.4	116.5	110.9	3.4

N.A.—Not available.
[a] Includes new and used.
Source: Bureau of the Census, "U. S. Exports of Domestic Merchandise, Schedule B, Commodity by Country of Destination," 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

Source: Bureau of the Census, "U. S. Exports of Domestic Merchandise, Schedule B, Commodity by Country of Destination," 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	371,980	110,817	37,913	223,250

[a] Aircraft includes new and used airplanes, seaplanes, and amphibians.
Source: Bureau of the Census, "U. S. Imports of Merchandise for Consumption," 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
TOTAL[a]	18,363	16,306	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

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 1968

Total and Destination	Number	Value[a] (Thousands of Dollars)
TOTAL	219	$26,546
Greenland	1	1,013
Canada	51	6,968
Latin America	64	5,090
Europe	25	4,184
Asia	33	6,756
Oceania	29	1,962
Africa	6	573

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.

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	2.2	2.7
1968	400.4	386.8	13.6	336.8	336.8	—	63.6	50.0	13.6
1969 (6 mos)	175.7	162.8	12.9	117.3	110.1	7.2	58.4	52.7	5.7

[a] "Credit" is a commitment of direct financing by the Export-Import Bank.
[b] "Guarantee" by the Export-Import Bank of principal and interest on a loan made by another institution such as a commercial bank.
Source: Export-Import Bank of the United States, Office of the Treasurer-Controller.

MANPOWER

The aerospace industry maintained its position in 1968 as the largest manufacturing employer in the nation with over 1.4 million workers. The industry's employment is substantially larger than other manufacturing industries. The motor vehicle industry with about 900,000 employees is the second largest manufacturing employer.

Aerospace employment in 1968 reached a record average of 1,418,000, up from 1,392,000 a year earlier. Aircraft employment rose slightly from 610,000 in 1967 to 630,000 in 1968, while missile and space employment increased from 602,000 to 610,000.

In 1968 the number of aerospace production workers was 754,000, 53 percent of total aerospace employment. Both aircraft and missile and space production workers increased between 1967 and 1968.

Employment of scientists and engineers on research and development rose above 100,000 for the first time in the aerospace industry, reaching 106,300. In 1968, according to the National Science Foundation, the aerospace industry was the single largest employer of research and development scientists and engineers. The proportion of research and

development scientists and engineers working in the aerospace industry rose from 26.8 to 27.4 percent between 1967 and 1968.

Average weekly earnings in the aerospace industry were $152.04 in 1968 compared to $146.54 in 1967, continuing their climb.

The five largest areas of aerospace employment in aircraft and parts during 1967[1] were: more than 311,000 in the Pacific region, 102,000 in New England, 94,000 in the Middle Atlantic, and 90,000 in West-North Central, 84,000 in East-North Central, with the remainder distributed throughout the nation.

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

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

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

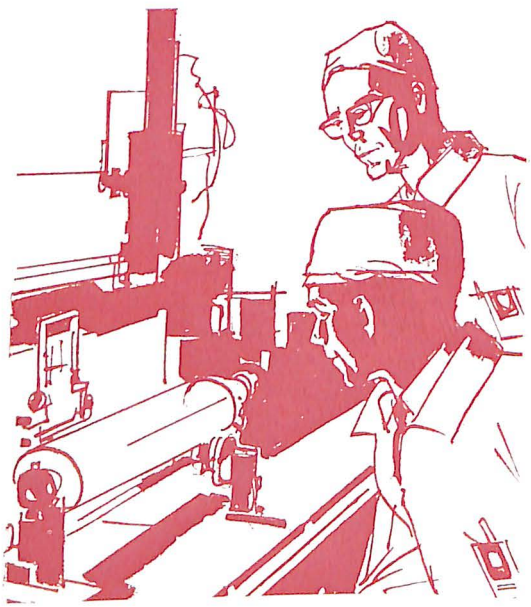
Monthly Average for the Year	Total Aerospace	Aircraft[a]		Missiles and Space[b]		Other[d]
		Total (Including Propulsion)	Propulsion	Total Missiles and Space	Communications Equipment[c]	
Total Employment (Thousands)						
1959	1,128	707	128	342	106	79
1960	1,074	638	124	356	118	80
1961	1,096	557	121	421	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
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

[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[r]	367,200	98,800	26.8
1968	387,900	106,300	27.4

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[E]
1940	148.6	101.8	31.4	15.4[E]
1941	347.1	234.6	75.3	37.2[E]
1942	831.7	549.6	192.0	90.1[E]
1943	1,345.6	882.1	314.9	148.6[E]
1944	1,296.6	815.5	339.7	141.4[E]
1945	788.1	489.9	210.0	87.3[E]
1946	237.3	159.0	49.9	28.4[E]
1951	467.8	313.3	95.0	59.5[E]
1953	795.5	472.4	191.2	131.9[E]
1955	761.3	466.6	168.0	126.7[E]
1957	895.8	519.0	213.2	163.6[E]
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				
Feb.	812.5	468.7	201.4	142.4

[E] Estimate.

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 215,200 employees in the aircraft and parts industry worked on missiles and spacecraft in December, 1968.

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[E]
1940	118.0	79.2	26.5	12.3[E]
1941	278.3	183.8	65.0	29.5[E]
1942	674.8	433.9	168.3	72.6[E]
1943	1,090.5	692.1	278.8	119.6[E]
1944	1,016.0	616.3	290.3	109.4[E]
1945	591.0	360.5	164.9	65.6[E]
1946	167.5	113.1	34.0	20.4[E]
1951	348.4	234.8	66.5	47.1[E]
1953	586.2	346.8	136.1	103.3[E]
1955	525.5	322.5	108.5	94.5[E]
1957	591.4	342.4	132.1	116.9[E]
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 Feb.	472.3	261.3	114.8	96.2

[E] Estimate.

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 127,000 production workers in the aircraft and parts industry worked on missiles and spacecraft in December, 1968.

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				
Feb.	3.81	3.86	3.81	3.67

NOTE: The production workers surveyed include substantial missile and spacecraft employment. See NOTE page 86.
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				
Feb.	156.59	162.12	146.69	152.67

NOTE: The production workers surveyed include substantial missile and spacecraft employment. See NOTE page 86.
N.A.—Not available.
Source: Bureau of Labor Statistics, "Employment and Earnings," (Monthly).

AVERAGE EMPLOYMENT IN THE AIRCRAFT AND PARTS INDUSTRY BY GEOGRAPHICAL DIVISION AND SELECTED STATES—1962 TO DATE[a]

Geographical Divisions and Selected States	1962	1963	1964	1965	1966	1967
TOTAL[b]	633,024	633,875	607,095	626,352	762,331	840,788
New England	76,762	77,531	75,071	80,220	93,516	101,867
Massachusetts	9,023	9,407	9,046	9,035	10,200	11,181
Connecticut	65,693	66,338	65,117	69,437	80,961	87,900
Me., N.H., Vt., R.I.	3,046	1,786	908	1,748	2,355	2,786
Middle Atlantic	74,476	82,771	74,116	74,723	88,363	94,132
New York	44,034	50,644	46,116	46,172	54,462	58,607
New Jersey	16,017	14,848	10,557	11,240	11,279	11,052
Pennsylvania	14,425	17,279	17,433	17,311	22,622	24,473
East North Central	70,107	69,023	62,695	64,142	76,858	84,386
Ohio	39,893	39,724	34,803	34,202	43,025	46,798
Indiana	18,592	19,677	18,894	19,590	21,808	23,271
Illinois	6,100	4,110	3,916	5,358	6,251	7,571
Mich., Wisc.	5,522	5,512	5,082	4,992	5,774	6,746
West North Central	60,047	63,029	70,423	69,474	85,689	90,812
Missouri	27,153	33,449	36,874	37,325	44,346	46,165
Kansas	31,805	28,840	32,542	31,095	40,036	42,982
Minn., Iowa, N.D., S.D., Neb.	1,089	740	1,007	1,054	1,307	1,665
South Atlantic	34,551	36,265	37,262	42,735	52,050	58,964
Maryland	3,640	3,094	2,577	3,193	4,951	5,439
Del., D.C., Va., W.Va., N.C., S.C.	1,210	1,842	1,621	2,497	3,593	4,992
Georgia	14,396	17,064	18,482	20,624	23,490	25,587
Florida	15,305	14,265	14,582	16,421	20,016	22,946
East South Central	7,498	8,561	6,338	8,832	13,157	13,940
Alabama	7,435	7,435	5,382	7,650	7,835	7,758
Tennessee	1,004	1,126	956	1,182	4,343	5,106
Ky., Miss.					979	1,076
West South Central	41,237	40,310	44,244	45,492	56,230	61,728
Texas	36,158	34,265	37,385	37,690	46,394	57,947
Ark., La.,	5,079	6,045	6,859	366	804	1,135
Oklahoma[c]				7,436	9,032	9,646
Mountain	21,956	20,926	17,198	15,447	15,984	16,408
Arizona	5,451	5,252	4,833	5,627	6,848	7,620
Utah[c]	11,695	12,047	8,786	6,245	5,248	4,484
Mont., Idaho, Wyo., Colo., N.Mex., Nev.	4,810	3,627	3,579	3,575	3,888	4,304
Pacific	246,349	235,459	218,959	225,202	280,355	311,343
California	172,413	170,634	165,213	167,075	193,421	210,700
Washington	73,326	64,204	52,591	56,940	85,415	98,740
Ore., Alaska, Hawaii	610	621	1,155	1,187	1,519	1,903

NOTE: Corresponding data for the years since 1947 may be found in "Aerospace Facts and Figures," earlier editions.

[a] The difference between these totals and employment totals appearing elsewhere are due to technical differences in methodologies of B.E.S., B.L.S., and Census, and do not seriously affect the usability of the data. The definition used is the narrow "aircraft industry" definition (SIC 372) which is narrower than the definition of "aerospace" used in some other tables.

[b] Includes Puerto Rico.

Source: Department of Labor, Bureau of Employment Security.

THE FOURTEEN LARGEST AEROSPACE LABOR MARKET AREAS[a]
As of October 1967

	Aerospace Employment (Thousands)	Per Cent of Total U.S. Employment in Aerospace
TOTAL, U. S.	1,393.4	100.0
TOTAL, Fourteen Largest Areas[a]	833.9	59.9
Los Angeles-Long Beach, Calif.	247.2	17.7
New York, New York	55.8	4.0
Anaheim-Santa Ana-Garden Grove, Calif.	54.0	3.9
Hartford, Conn.	51.0	3.7
Philadelphia, Pa.	45.7	3.3
Boston, Mass.	41.8	3.0
San Jose, Calif.	41.8	3.0
Fort Worth, Tex.	37.5	2.7
Wichita, Kans.	36.6	2.6
San Diego, Calif.	31.1	2.2
Minneapolis-St. Paul, Minn.	22.1	1.6

[a] Includes all areas with aerospace employment of 20,000 or more. To avoid disclosure three large labor market areas are excluded in the details below. They are (1) Seattle, Washington, (2) St. Louis, Missouri and (3) Atlanta, Georgia with 169,279 employees.
Source: Department of Labor, Bureau of Employment Security.

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

N.A.—Not available.
NOTE: The "aircraft and parts industry" to which this table applies includes substantial missile and spacecraft employment. It represents approximately 60 per cent of total aerospace employment.
Source: Department of Labor, Bureau of Labor Statistics, Division of Wages and Industrial Relations.

FINANCE

Sales of the aerospace industry continued to grow in 1968. Net sales, as reported to the Securities and Exchange Commission from a limited number of companies, increased from $22.7 billion in 1967 to $26.9 billion in 1968, a gain of 18 percent.

Net profit after taxes rose from $610 million to $857 million, while net profit retained in business rose from $382 million to $552 million. As a result, the ratio of profits on sales rose from 2.7 percent to 3.2 percent. However, this is still substantially below the average of all manufacturing of 5.1 percent.

In the period 1967 to 1968 the value of stockholders equity (net worth) including capital stock and earned surplus and reserves rose by 27.8 percent from $4,722 million to $6,037 million. Net working capital, the difference between current assets and current liabilities also rose substantially from $2,828 million in 1967 to $3,768 million in 1968.

In 1968, 46.6 percent of total income was paid to the federal government in income taxes. This amount rose between 1967 and 1968 from $489 million to $749 million, an increase of 53.2 percent.

Total assets of aerospace firms rose from $14,704 million in 1967 to $18,332 million in 1968. While short term debt declined between 1967 and 1968 from $1,055 million to $789 million, long term debt increased from $1,897 million to $2,668 million.

Capital spending anticipated for 1969 was $840 million, an increase of 18.3 percent from $710 million in 1968. In the period between 1963 and 1969 the level of such spending has more than doubled.

COMPOSITION OF CURRENT ASSETS, 1956 TO DATE, AEROSPACE COMPANIES
(in Per Cent 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

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
1963 to Date
(Millions of Dollars)

	1963	1964	1965	1966	1967	1968
Assets:						
Current Assets						
Cash	$ 435	$ 415	$ 395	$ 369	$ 460	$ 576
U. S. Government Securities	39	74	75	46	16	37
Total Cash and U. S. Govt. Securities	$ 474	$ 489	$ 470	$ 415	$ 476	$ 613
Receivables (total)	1,847	1,695	1,788	2,066	2,387	2,840
Inventories (gross)	3,936	3,876	4,048	5,453	7,550	9,267
Other current assets	174	193	331	302	314	396
Total Current Assets	$6,431	$6,253	$6,637	$ 8,236	$10,727	$13,116
Total Net Plant	1,575	1,591	1,670	2,148	2,849	3,542
Other Non-Current Assets	278	341	402	684	1,128	1,674
Total Assets	$8,284	$8,185	$8,709	$11,068	$14,704	$18,332
Liabilities:						
Current Liabilities						
Short term loans	461	388	339	670	1,055	789
Advances by U. S. Govt.	1,674	1,725	1,868	2,446	3,578	4,317
Trade accounts and notes payable	1,072	928	835	1,098	1,391	1,922
Federal income taxes accrued	255	239	252	256	229	304
Installments due on long term debt	28	38	45	61	88	110
Other current liabilities	756	770	1,043	1,369	1,558	1,906
Total current liabilities	$4,246	$4,088	$4,382	$ 5,900	$ 7,899	$ 9,348
Long Term Debt	835	816	807	1,094	1,897	2,668
Other Non-Current Liabilities	42	47	67	100	186	279
Total Liabilities	$5,123	$4,951	$5,256	$ 7,094	$ 9,982	$12,295
Stockholders' Equity:						
Capital Stock	1,354	1,339	1,312	1,488	1,785	2,254
Earned Surplus and Reserves	1,808	1,895	2,142	2,486	2,937	3,783
Total Net Worth	$3,162	$3,234	$3,454	$ 3,974	$ 4,722	$ 6,037
Total Liabilities and Stockholder's Equity	$8,284	$8,185	$8,709	$11,068	$14,704	$18,332
Net Working Capital	$2,185	$2,166	$2,256	$ 2,336	$ 2,828	$ 3,768

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 as a Percent of Sales After Taxes
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

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."

INCOME ACCOUNTS, AEROSPACE COMPANIES
1962 to Date
(Millions of Dollars)

	1962	1963	1964	1965	1966	1967	1968
Net Sales	$15,206	$15,313	$15,403	$16,073	$19,224	$22,739	$26,852
Net Profit from Operations	739	695	756	997	1,076	1,152	1,661
Total Income before Federal Income Taxes	682	665	748	984	1,046	1,099	1,606
Provision for Federal Income Taxes	322	316	351	460	473	489	749
Net Profit after Taxes	360	350	395	524	572	610	857
Net Profit Retained in Business	231	214	241	339	380	382	552

NOTE: Does not include data for companies which produce areospace 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, 1967-June 30, 1968
(Millions of Dollars)

Company	July 1, 1963 to June 30, 1964	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
U. S. TOTAL ALL CONTRACTS	$25,163.7	$24,177.8	$33,532.6	$39,219.4	$38,826.6
General Dynamics	986.7	1,178.6	1,136.0	1,831.0	2,239.3
Lockheed	1,455.4	1,715.0	1,531.0	1,807.2	1,870.2
General Electric	892.6	824.3	1,187.0	1,289.8	1,488.7
United Aircraft	625.4	632.1	1,138.7	1,097.1	1,321.0
McDonnell Douglas[a]	2,386.5	1,025.9	1,001.0	2,124.6	1,110.8
Boeing	1,365.2	583.3	914.5	911.7	762.1
American Telephone & Telegraph	635.6	587.6	672.1	637.0	775.9
Ling-Temco-Vought	247.5	264.7	310.8	534.7	758.3
North American Rockwell[b]	1,019.5	745.8	520.4	688.8	668.6
General Motors	255.8	254.4	508.0	625.1	629.6
Grumman	395.6	353.4	322.9	487.7	629.2
Avco	278.7	234.2	506.0	419.5	583.6
Textron	216.3	195.7	554.8	496.4	500.7
Raytheon	253.0	293.4	268.5	403.3	451.8
Sperry Rand	373.9	318.4	426.8	484.1	447.2
Martin Marietta	476.4	315.6	337.8	290.2	393.5
Ford (includes Philco)	211.2	312.0	247.9	403.8	381.3
Honeywell	107.5	82.5	250.6	313.7	351.7
Northrop	164.9	255.9	276.0	306.4	310.3
Hughes	288.7	278.3	336.6	419.5	286.1
Radio Corp. of America	233.6	213.9	242.4	268.4	255.0
Westinghouse Electric	236.9	260.9	348.7	453.1	251.0
General Tire & Rubber	364.4	302.0	327.3	273.1	248.1
International Telephone & Telegraph	256.1	206.7	219.8	255.2	241.6
International Business Machines	332.4	186.2	181.6	194.9	223.7
Bendix	257.4	234.9	281.8	296.1	223.6
Thiokol	253.6	136.2	110.7	172.7	119.4
Fairchild Hiller	89.2	70.1	80.1	93.5	121.3
Curtiss-Wright	51.2	49.3	91.1	90.8	75.4

[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, 1967-June 30, 1968)
(Millions of Dollars)

Company	July 1, 1963 to June 30, 1964	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
U. S. TOTAL, ALL CONTRACTS	$4,521.1	$4,141.4	$4,087.7	$3,864.1	$3,446.7
North American Rockwell[a]	917.2	1,099.4	1,128.9	983.8	838.7
Grumman	156.4	267.2	381.2	481.1	394.1
Boeing	197.1	306.0	313.7	273.5	296.7
McDonnell Douglas[b]	517.9	418.4	312.0	243.9	209.0
General Electric	143.6	181.5	235.7	179.3	190.7
International Business Machines	85.6	128.3	108.2	186.4	147.7
Bendix	41.9	66.1	78.0	120.0	123.8
Aerojet	[c]	[c]	100.5	95.7	67.1
Radio Corp. of America	49.8	106.6	51.3	57.5	63.2
Chrysler	99.4	86.0	83.5	76.6	62.6
General Dynamics	148.2	111.1	92.1	61.0	54.4
TRW	39.0	50.5	49.9	52.6	52.4
General Motors	41.9	72.5	123.3	65.2	46.8
Ling-Temco-Vought	21.5	15.1	28.8	46.3	42.7
Lockheed	39.0	35.8	44.5	42.0	40.5
Philco Ford	35.7	30.0	25.4	32.1	32.0
Sperry Rand	11.8	39.4	29.5	39.7	31.8
Martin Marietta	8.5	8.4	5.7	12.8	26.8
Catalytic Construction	5.9	25.3	5.5	11.1	18.8
United Aircraft	36.7	43.3	40.7	40.0	18.1
Brown Engineering	41.6	30.9	24.3	16.7	16.3
Honeywell	7.1	27.1	22.2	22.6	15.7
Northrop	2.6	7.3	9.7	8.8	15.4
Union Carbide	20.1	20.0	19.7	12.6	15.3
Brown/Northrop	[c]	4.0	[c]	10.0	14.5
General Precision	[c]	[c]	4.1	25.0	12.4
Garrett	3.0	7.2	7.0	9.3	10.7
Bellcomm	8.7	9.8	9.7	9.3	10.0

[a] North American only before FY 1968.
[b] Combined data for McDonnell and Douglas.
[c] Not in list of major contractors for indicated year.
Source: National Aeronautics and Space Administration, "NASA Annual Procurement Report." (Annually)

MILITARY PRIME CONTRACT AWARDS AND PERCENT OF U. S. TOTAL, BY REGION AND STATE[a]
Fiscal Years 1966–1968

Region and State	Million Dollars			Percent of U. S. Total		
	FY 1966	FY 1967	FY 1968	FY 1966	FY 1967	FY 1968
U. S. TOTAL	$31,713	$37,382	$37,248	100.0	100.0	100.0
New England	3,761	3,875	4,436	11.9	10.4	11.9
Connecticut	2,051	1,936	2,355	6.5	5.2	6.3
Maine	51	57	75	0.2	0.2	0.2
Massachusetts	1,336	1,422	1,619	4.2	3.8	4.3
New Hampshire	110	162	156	0.3	0.4	0.4
Rhode Island	132	198	126	0.4	0.5	0.3
Vermont	81	100	105	0.3	0.3	0.3
Middle Atlantic	5,574	6,146	6,320	17.8	16.4	17.0
New Jersey	1,090	1,235	1,109	3.4	3.3	3.0
New York	2,819	3,262	3,484	8.9	8.7	9.4
Pennsylvania	1,665	1,649	1,727	5.3	4.4	4.6
East North Central	4,860	4,982	4,883	15.3	13.3	13.1
Illinois	920	1,064	932	2.9	2.8	2.5
Indiana	1,068	898	1,108	3.4	2.4	3.0
Michigan	918	1,034	796	2.9	2.8	2.1
Ohio	1,589	1,602	1,641	5.0	4.3	4.4
Wisconsin	365	384	406	1.1	1.0	1.1
West North Central	2,358	3,736	2,753	7.4	10.0	7.4
Iowa	248	279	261	0.8	0.7	0.7
Kansas	313	399	292	1.0	1.1	0.8
Minnesota	498	651	620	1.6	1.7	1.7
Missouri	1,112	2,278	1,357	3.5	6.1	3.6
Nebraska	80	103	121	0.3	0.3	0.3
North Dakota	83	17	68	0.3	[b]	0.2
South Dakota	23	9	34	0.1	[b]	0.1
South Atlantic	3,975	4,661	4,481	12.5	12.5	12.0
Delaware	37	52	43	0.1	0.1	0.1
District of Columbia	328	358	350	1.0	1.0	0.9
Florida	767	799	976	2.4	2.1	2.6
Georgia	799	1,148	964	2.5	3.1	2.6
Maryland	843	868	703	2.7	2.3	1.9
North Carolina	449	448	487	1.4	1.2	1.3

MILITARY PRIME CONTRACT AWARDS AND PERCENT OF U. S. TOTAL, BY REGION AND STATE[a]—*Continued*
Fiscal Years 1966–1968

Region and State	Million Dollars			Percent of U. S. Total		
	FY 1966	FY 1967	FY 1968	FY 1966	FY 1967	FY 1968
South Carolina	177	181	133	0.6	0.5	0.4
Virginia	426	665	693	1.3	1.8	1.9
West Virginia	145	142	132	0.5	0.4	0.4
South Central	3,865	5,562	6,214	12.2	14.5	16.7
Alabama	282	297	409	0.9	0.8	1.1
Arkansas	96	127	121	0.3	0.3	0.3
Kentucky	70	124	60	0.2	0.3	0.2
Louisiana	303	656	461	1.0	1.8	1.2
Mississippi	162	115	369	0.5	0.3	1.0
Oklahoma	159	158	165	0.5	0.4	0.4
Tennessee	502	538	542	1.8	1.4	1.5
Texas	2,291	3,547	4,087	7.2	9.5	11.0
Mountain	837	875	838	2.6	2.3	2.3
Arizona	248	250	287	0.8	0.7	0.8
Colorado	256	210	263	0.8	0.6	0.7
Idaho	20	15	17	0.1	[b]	[b]
Montana	14	78	20	[b]	0.2	0.1
Nevada	32	29	18	0.1	0.1	[b]
New Mexico	86	81	87	0.3	0.2	0.2
Utah	170	179	131	0.5	0.5	0.4
Wyoming	11	33	15	[b]	0.1	[b]
Pacific	6,347	7,394	7,121	20.0	19.8	19.1
California	5,813	6,689	6,472	18.3	17.9	17.4
Oregon	90	99	120	0.3	0.3	0.3
Washington	444	606	529	1.4	1.6	1.4
Alaska and Hawaii	136	151	202	0.4	0.4	0.5
Alaska	72	86	106	0.2	0.2	0.3
Hawaii	64	65	96	0.2	0.2	0.2

[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 1966, 1967, 1968".

CAPITAL SPENDING,
ALL MANUFACTURING AND THE AEROSPACE INDUSTRY
Calendar Years 1963 to Date
(Millions of Dollars)

Year Ending December 31	All Manufacturing Industries	Aerospace Industry	Aerospace Industry As a Per Cent of All Manufacturing
1963	$15,690	$390	2.5%
1964	18,584	350	1.9
1965	22,449	410	1.8
1966	26,986	770	2.9
1967	26,692	770	2.9
1968[E]	26,441	710	2.7
1969[P]	29,380	840	2.9

[E] Estimated.
[P] Planned.
Source: U. S. Department of Commerce, Office of Business Economics; McGraw-Hill, Inc., Economics Department.

Military Prime Contract Awards of $10,000 or More for Selected Major Military Hard Goods, by Geographic Region
Fiscal Years 1966–1968

Program and Region	Million Dollars			Percent of Program Total		
	FY 1966	FY 1967	FY 1968	FY 1966	FY 1967	FY 1968
Aircraft	$7,791	$10,087	$9,644	100.0	100.0	100.0
New England	1,631	1,532	1,791	20.9	15.2	18.6
Middle Atlantic	1,133	1,273	1,266	14.5	12.6	13.1
East North Central	1,018	1,071	1,080	13.1	10.6	11.2
West North Central	886	1,918	876	11.4	19.0	9.1
South Atlantic	695	1,068	980	8.9	10.6	10.2
South Central	1,321	2,124	2,577	17.0	21.1	26.7
Mountain	100	93	74	1.3	0.9	0.8
Pacific	1,006	1,008	999	12.9	10.4	10.4
Alaska and Hawaii	1	1	1	[a]	[a]	[a]
Missile and Space Systems	$4,359	$4,564	$4,945	100.0	100.0	100.0
New England	422	463	577	9.7	10.2	11.7
Middle Atlantic	529	467	548	12.1	10.2	11.1
East North Central	161	208	200	3.7	4.6	4.0
West North Central	197	114	151	4.5	2.5	3.0
South Atlantic	512	441	516	11.7	9.7	10.4
South Central	132	145	143	3.0	3.2	2.9
Mountain	282	314	261	6.5	6.9	5.3
Pacific	2,123	2,412	2,528	48.7	52.9	51.1
Alaska and Hawaii	1	[b]	21	[a]	[a]	0.4
Electronics and Communication Equipment	$3,792	$4,388	$3,980	100.0	100.0	100.0
New England	435	575	552	11.5	13.1	13.9
Middle Atlantic	1,132	1,200	1,095	29.9	27.3	27.5
East North Central	390	424	409	10.3	9.7	10.3
West North Central	260	248	192	6.8	5.6	4.8
South Atlantic	535	665	520	14.1	15.2	13.1
South Central	256	232	254	6.8	5.3	6.4
Mountain	88	88	109	2.3	2.0	2.7
Pacific	694	944	833	18.3	21.5	20.9
Alaska and Hawaii	2	12	16	[a]	0.3	0.4

[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 1966, 1967, 1968".

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 1968

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	$6,427	100.0	$391	100.0	$285	100.0	$5,751	100.0
New England	681	10.6	130	33.3	42	15.0	509	8.9
Middle Atlantic	908	14.1	54	13.9	23	8.1	831	14.4
East North Central	589	9.2	31	8.0	23	7.9	535	9.3
West North Central	147	2.3	9	2.3	2	0.6	136	2.4
South Atlantic	927	14.4	82	20.9	48	16.8	797	13.9
South Central	523	8.1	15	3.8	8	2.7	500	8.7
Mountain	254	4.0	18	4.5	4	1.3	232	4.0
Pacific	2,385	37.1	46	11.8	135	47.6	2,204	38.3
Alaska and Hawaii	13	0.2	6	1.5	[b]	[c]	7	0.1

[a] Includes contracts with other government agencies.
[b] Less than $500,000.
[c] 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 1966, 1967, 1968".

AIR TRANSPORTATION

Domestically and internationally, U. S. scheduled airlines substantially exceeded past records in 1968 by carrying 150 million passengers over 113.9 billion revenue passenger-miles. The year previous they carried 132 million passengers over nearly 99 billion passenger miles. World airlines (exclusive of mainland China and the U.S.S.R.) flew 263 million passengers over 3.7 billion miles during 1968.

This growth has been experienced each consecutive year since 1926. However, in recent years it has been more noticeable as the airlines have replaced piston-powered equipment with jet transports. By the beginning of 1969, U. S. airlines alone were flying 2,239 turbine-powered aircraft as opposed to 331 piston-powered aircraft. Air routes have been extended and it has been possible to carry more and more of the air-minded, expanding populace in the larger jets.

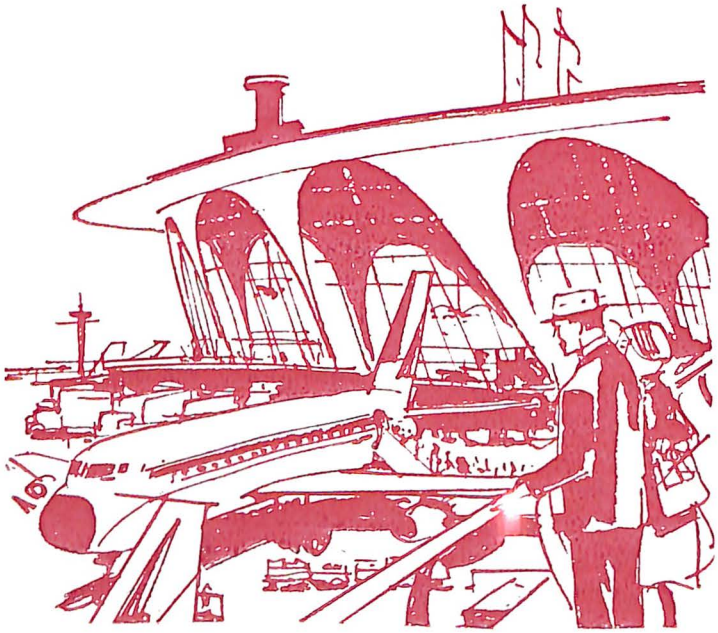
In addition to passengers, U. S. scheduled airlines were also able to increase cargo tonnage in 1968 to 3.9 billion ton miles from 3.5 billion in 1967. Mail increased from 985 million ton miles in 1967 to 1.3 billion by 1968 as more and more surface mail was expedited by air.

Net value of U. S. domestic airline equipment was more than $5 billion compared to $3.8 billion in 1967.

U. S. aircraft manufacturers had at the end of 1968 a backlog of orders from foreign and domestic customers for 1,698 aircraft valued at $10 billion. This total represents 914 transports worth $9.5 billion and 784 executive-type aircraft worth $492 million. The largest orders were for the new generation wide-bodied jet transports.

The nation's public airports increased from 10,126 in 1967 to 10,470 in 1968, according to the Federal Aviation Administration. This includes 242 airports with runways 10,000 feet or more which can handle the large jet transports. The major number of airports, 1,804, are located in the Pacific region of the country.

"The dynamic growth of the air transport industry and its emergence as the major form of public intercity transportation have made it imperative that the development and improvement of the national aviation system keep pace with that growth," Stuart G. Tipton, president of the Air Transport Association, states. "The restrictions which have gone into effect at five major airports this year are unmistakable signs of past neglect in this regard. What is needed now is for the federal government to take leadership in providing the funds for new and improved airways and the stimulus for the development of more and better airports to handle the increased volume of traffic."



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.

ORDERS AND DELIVERIES BY YEAR FOR EXECUTIVE TYPE JET AIRCRAFT As of December 31, 1968

	Total Aircraft	Domestic Orders	Foreign Orders
TOTAL			
Number of aircraft	784	649	135
Value-million dollars	$492	$425	$67
FOR 1969 DELIVERY			
Number of aircraft	356	284	72
Value-million dollars	$230	$195	$35
FOR 1970 DELIVERY			
Number of aircraft	428	365	63
Value-million dollars	$262	$230	$32

Source: Aerospace Industries Association, reports from member companies.

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

	1962	1963	1964	1965	1966	1967
TOTAL MANUFACTURED IN U. S.	2,345	2,266	2,317	2,548	2,556	2,731
4 Engine	1,474	1,434	1,417	1,493	1,410	1,420
Turbojets	517	580	627	738	825	941
Boeing 707	209	206	233	291	365	467
Boeing 720	51	55	109	119	118	121
Boeing 720B	25	52				
McDonnell Douglas DC-8	167	183	199	236	254	276
Convair 880	44	53	53	52	53	58
Convair 990	21	31	33	40	35	19
Turboprops	137	137	137	136	136	127
Lockheed Electra	137	137	137	136	133	124
Lockheed L-100 Hercules	—	—	—	—	3	3
Piston Engine	820	717	655	619	449	352
Lockheed Constellation	206	179	176	136	83	31
Douglas DC-7	232	178	133	85	47	23
Douglas DC-6	277	257	250	265	210	193
Douglas DC-4	105	103	96	132	109	105
Boeing Stratocruiser	—	—	—	1	—	—
3 Engine	—	4	97	193	309	441
Boeing 727 (turbojet)	—	4	97	193	309	441
2 Engine	833	783	754	803	791	836
Turbojets	—	—	—	4	59	176
McDonnell Douglas DC-9	—	—	—	4	59	176
Turboprops	7	7	7	7	18	28
Fairchild F-27/F-227	7	7	7	7	18	22
Convair 640	—	—	—	—	—	6
Piston Engine	826	776	747	792	714	632
Convair 240, 340, 440	250	228	201	190	177	161
Martin 202, 404	4	4	—	4	—	—
Curtiss Commando C-46	36	37	38	57	56	44
Douglas DC-3/C-47	516	479	471	481	441	391
Other	20	28	37	60	40	36
1 Engine	12	18	19	21	13	10
Helicopters	26	27	30	38	33	24
ALL MANUFACTURERS GRAND TOTAL	3,162	3,086	3,137	3,461	3,541	3,725
Per Cent of Grand Total Manufactured in U. S.	74.2	73.4	73.9	73.6	72.2	73.3

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	28,500	725	190
1955	1,425	68	38,000	905	255
1956	1,580	77	44,000	1,030	275
1957	1,765	86	50,500	1,125	295
1958	1,820	88	53,000	1,150	320
1959	1,920	98	61,000	1,330	355
1960	1,925	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	2,290	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	3,300	235	170,000	4,600	1,295
1968	3,720	263	191,000	4,931	1,497

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, 1967, 1968, AND 1969
(Number of Aircraft)

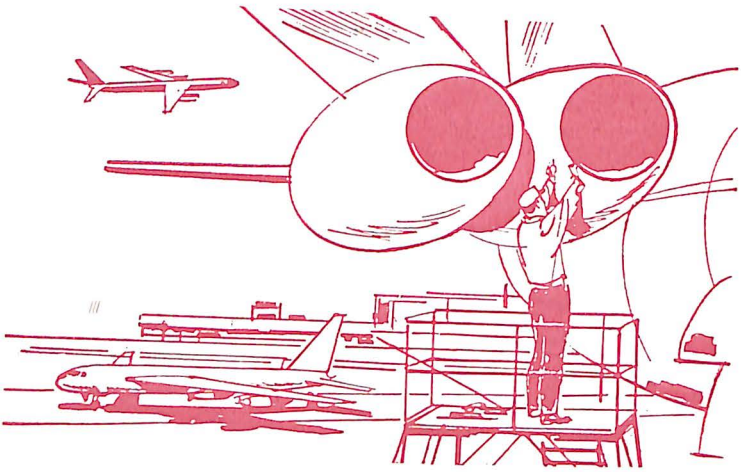
Type of Aircraft, Number of Engines, and Model	January 1		
	1969	1968	1967
TOTAL, AIRCRAFT	2,586	2,452	2,272
Total fixed-wing	2,570	2,430	2,251
Turbine-powered—total	2,239	1,788	1,378
Four engine—total	983	902	796
Turbojet—total	816	706	586
Boeing 707	393	338	245
Boeing 720	134	135	129
Convair 880	41	45	46
Convair 990	11	14	17
McDonnell Douglas DC-8	237	173	149
Lockheed 1329	—	1	—
Turboprop—total	167	196	210
Armstrong Whitworth Argosy AW-650	7	5	6
Canadair CL-44	14	19	22
Lockheed 188	114	125	125
Lockheed 382	13	9	5
Vickers Viscount 745	19	38	44
Vickers 810/812	—	—	8
Three-engine—total	619	410	287
Boeing 727	543	410	287
Boeing 737	76	—	—
Twin-engine—total	630	469	287
Turbojet—total	346	228	133
British Aircraft Corp. BAC-111	60	57	54
Sud Aviation Caravelle SE-210	20	20	20
McDonnell Douglas DC-9	266	148	56
Dassault SE-20	—	3	3
Turboprop—total	284	241	154
Convair 240T	36	29	28
Convair 340T	113	85	42
De Havilland DH/DH-C	6	3	—
Fairchild F-27	48	49	64
Fairchild FH-227	55	58	16
Grumman G-159	1	1	1
Grumman G-21T	2	1	—
Nord 262	12	12	—
Short SC-7	2	1	—
Nihon YS-11	9	2	3

(*Continued on next page*)

COMPOSITION OF U. S. AIR LINE FLEET, BY TYPE OF AIRCRAFT, NUMBER OF ENGINES AND MODEL; JANUARY 1, 1967, 1968, 1969—*Continued*
(Number of Aircraft)

Type of Aircraft, Number of Engines, and Model	January 1		
	1969	1968	1967
Single-engine turboprop—total	7	7	8
Pilatus PC-6A	3	3	4
Pilatus PC-6B	4	4	4
Piston-powered—total	331	642	873
Four-engine—total	82	265	388
Boeing 377	—	—	1
Douglas DC-4	8	10	10
Douglas DC-6	40	133	164
Douglas DC-7	29	55	91
Lockheed 049/149	4	5	6
Lockheed 749	1	7	37
Lockheed 1049/1649	—	55	79
Twin-engine—total	230	357	461
Aero Commander 680E	1	1	1
Convair 28-5-ACF	4	4	4
Convair 240	3	12	32
Convair 340/440	46	78	112
Curtiss C-46	44	63	69
Douglas DC-3	56	107	137
Fairchild C82	4	4	4
Grumman G-21	17	18	19
Grumman G-44	3	2	3
Grumman G-73	1	2	1
Grumman SA-16	2	2	2
Martin 202	2	2	1
Martin 404	47	57	75
Other	—	5	—
Single-engine—total	15	20	24
Rotary Wing—total	16	22	21
Turbine-powered—total	13	17	16
Sikorsky S-61	8	9	9
Sikorsky S-62	1	1	1
Vertol V-107-II	4	7	7
Piston-powered—total	3	5	5
Sikorsky S-55	—	2	2
Sikorsky S-58C	3	3	3

Source: Department of Transportation, Federal Aviation Administration, "U. S. Civil Carrier Fleet" (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	98,747	3,537	985
1968	2,146	150	113,911	3,874	1,268

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	134,416	87,459.9	15,753	26,450.6

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	5,076	81.0

[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

[a] Excludes helicopters.
Source: Civil Aeronautics Board.

TOTAL ORDERS FOR JET AIRCRAFT
(Domestic and Foreign)
Airline and Executive-Type Fixed Wing
As of December 31, 1968

	TOTAL Aircraft for Delivery in 1969 or Later	Domestic Orders	Foreign Orders
TOTAL			
Number of aircraft	1,698	1,269	429
Value-million dollars	$10,017	$7,181	$2,836
TRANSPORTS			
Number of aircraft	914	620	294
Value-million dollars	$9,525[a]	$6,756[a]	$2,769[a]
EXECUTIVE TYPE			
Number of aircraft	784[b]	649[b]	135[b]
Value-million dollars	$492	$425	$67
NUMBER OF TRANSPORT AIRCRAFT			
Boeing			
B-707	59	42	17
B-727	99	82	17
B-737	119	73	46
B-747	161	104	57
Lockheed			
L-1011	181	131	50
McDonnell Douglas			
DC-8	110	60	50
DC-9	114	59	55
DC-10	69	69	—
Fairchild Hiller			
F-27	2	—	2

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

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
	Amount	Amount	Amount	Amount	Amount	Amount
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

[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
	Amount	Amount	Amount
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

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

GENERAL AVIATION

General aviation, which comprises all aviation in the U. S. except for airline and military aviation, made a substantial contribution to the nation's total air transportation economy in 1968.

Manufacturers produced 13,698 aircraft valued at more than $421.5 million during the year, 17 percent higher than 1967 net billings. Exports continued strong with the sale of 2,879 aircraft valued at nearly $101.3 million reflecting the growing requirements for these aircraft throughout the world.

Net profits were mixed as the result of expanded manufacturing facilities and the introduction of new model lines. The labor force increased to more than 25,000 workers, up 1.3 percent from 1967.

The increased dollar volume stemmed primarily from the introduction of new twin-engine aircraft and increased sales of turbine-powered aircraft by manufacturers.

The most dramatic growth in general aviation during 1968 was seen in the air taxi-commuter services which jumped from 165 to 240 firms serving 843 communities. More than 70 air taxi companies are now offering scheduled service. And the use of air taxi by the Post Office Department during the past three years had increased by 1968 from a few small contracts to more than 150 routes.

One reason for the rapid growth of air taxi-commuter companies has been the introduction of aircraft specifically designed for this use.

General aviation provides the connecting link between major air traffic hubs and hundreds of cities which have infrequent airline service as well as the thousands of communities which are totally dependent on general aviation as their connection with the air transportation system.

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

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, 1968

Year of Manufacture	Number	Per cent of Total
TOTAL	116,781	100.0
1967	10,056	8.6
1966	12,263	10.5
1965	9,254	7.9
1964	7,054	6.0
1963	5,406	4.6
1962	4,621	4.0
1961	4,497	3.8
1960	5,092	4.4
1959	5,562	4.8
1958	4,325	3.7
1957 and prior years	48,651	41.7

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" (Annually).

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

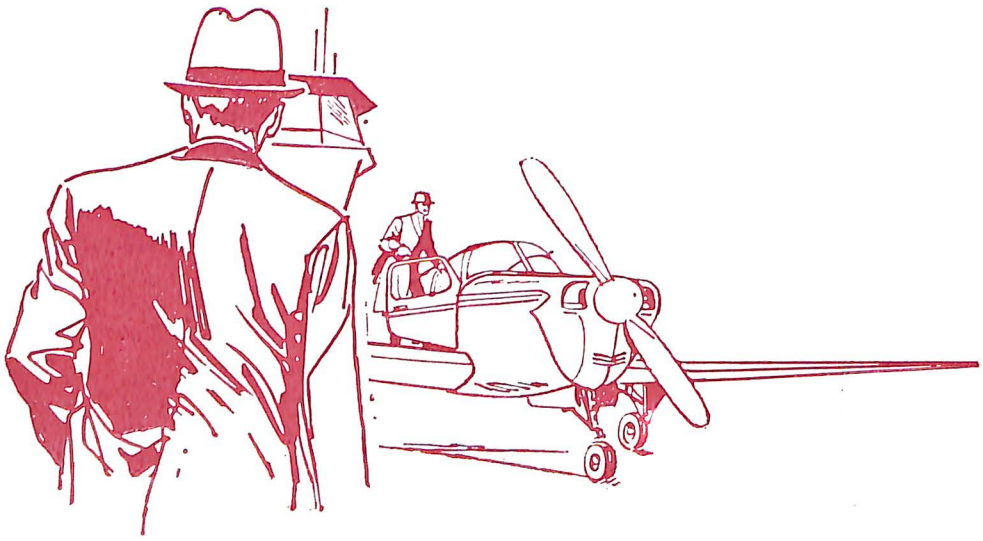
Year Jan. 1	Active Civil Aircraft								Airports on Record with FAA
	TOTAL	Total Air Carrier[a]	General Aviation Aircraft						
			TOTAL	Fixed-Wing Aircraft			Rotorcraft[b]	Other[c]	
				Multi-engine	Single-Engine				
					4-place & over	3-place & less			
1954	55,505	1,615	53,890	N.A.	N.A.	N.A.	N.A.	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

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

– Estimate.
[a] Includes special certificated 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
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

[a] Less than .05 per cent.
Source: Federal Aviation Administration, "FAA Statistical Handbook of Aviation" (Annually).

VERTICAL LIFT AIRCRAFT

Scheduled helicopter airlines experienced a slight dip in passengers carried during 1968 as well as revenue ton miles flown. Helicopter operators reported to the Civil Aeronautics Board that they carried more than one million passengers, 78,000 less than 1967, over 24,856,000 revenue passenger miles.

A total 2,482,000 revenue ton miles were flown by helicopter airlines during the year down from 2,960,000 carried in 1967. This included 120,000 revenue ton-miles of U. S. air mail, express, air freight and excess baggage.

The number of helicopter pilots increased from 12,698 at the beginning of 1967 to 17,607 at the end of 1968, according to the Federal Aviation Administration.

By 1968 there were 1,892 heliports and helistops in the U. S., Canada and Puerto Rico, 158 of which were elevated. This compares to 1,225 heliports built by the end of 1966. And the number of hospital heliports grew to 147 in 1968 with 39 proposed compared to 88 such heliports in 1967.

An AIA Directory of Foreign Helicopter Operators to be published in 1969 discloses that there are 859 helicopter operators in 104 foreign countries flying a total of nearly 7,000 helicopters.

The helicopter continues to be used also as an agricultural sprayer, construction crane, forest fire fighter, executive transport, and is proving effective in city traffic patrol and in the urban fight against crime as well as an airborne ambulance.

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

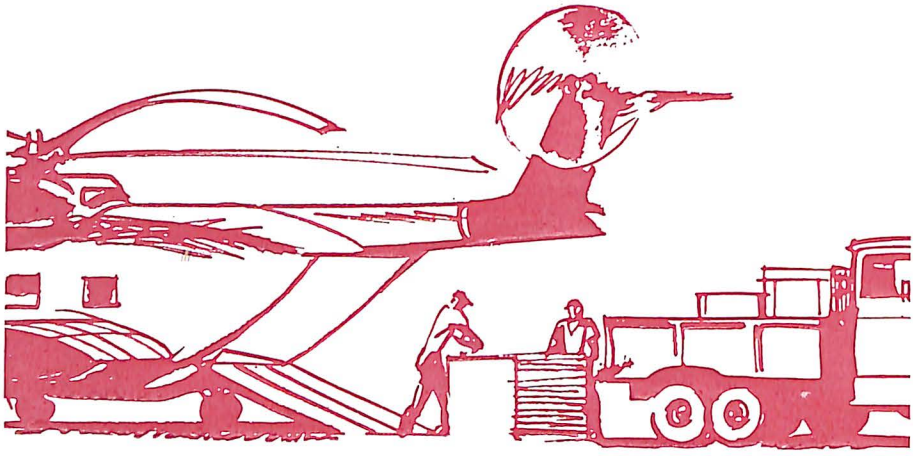
Year Ending Dec. 31	Passengers Carried	Revenue Ton-Miles Flown	Revenue Passenger-Miles Flown	Revenue Plane-Miles Flown
1952	—	75	—	632
1953	1	127	26	1,007
1954	8	151	183	1,074
1955	29	193	628	1,152
1956	64	281	1,585	1,318
1957	153	449	3,275	1,604
1958	230	594	4,885	1,675
1959	366	856	7,477	1,899
1960	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

Source: Civil Aeronautics Board.

HELICOPTER PILOTS
As of 1 January 1969

Type	TOTAL	Helicopter Only	Helicopter and Airplane	Other
TOTAL	17,607	3,166	14,315	126
Private	860	232	550	78
Commercial	16,474	2,732	13,694	48
Airline Transport Rating	273	202	71	—

Source: Federal Aviation Administration, Statistical Department.



AIR TRANSPORTATION

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

Year Ending Dec. 31	TOTAL TON-MILES	Passenger	U. S. Mail	Express	Freight	Excess Baggage
1952	75	—	75	—	—	—
1953	127	2	125	—	2	—
1954	151	18	116	13	4	—
1955	193	59	97	32	5	—
1956	281	146	91	36	7	1
1957	449	314	91	34	7	3
1958	594	468	84	33	6	3
1959	856	717	87	41	7	4
1960	1,054	911	91	40	7	5
1961	963	818	94	40	7	5
1962	897	778	65	44	6	3
1963	1,317	1,189	74	44	6	5
1964	1,668	1,520	92	45	6	6
1965	1,948	1,787	84	60	10	6
1966	2,562	2,415	60	70	10	7
1967	2,960	2,819	61	64	9	8
1968	2,482	2,361	57	48	8	7

Source: Civil Aeronautics Board.

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—1968

	1965	1966	1967[a]	1968[b]
TOTAL	34	67	88	147
New England	1	2	2	2
Middle Atlantic	4	8	10	19
East North Central	1	12	14	50
West North Central	—	1	2	4
South Atlantic	10	13	16	19
East South Central	—	1	1	1
West South Central	9	13	16	16
Mountain	1	3	8	9
Pacific	8	14	19	27

[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.
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
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

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

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