

1992 Census of Manufactures

MC92-I-37B

INDUSTRY SERIES

Aerospace Equipment, Including Parts

Industries 3721, 3724, 3728, 3761, 3764,
and 3769



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David J. Barram, Deputy Secretary

Economics and Statistics Administration
Everett M. Ehrlich, Under Secretary
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BUREAU OF THE CENSUS
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Manufacturing and Construction Division prepared this report. **David W. Cartwright**, Assistant Chief for Census and Related Programs, was responsible for the overall planning, management, and coordination of the census of manufactures. Planning and implementation were under the direction of **Bruce M. Goldhirsch**, Chief, Electrical and Transportation Branch, assisted by **Raphael S. Corrado**, Section Chief, with primary staff assistance by **Richard A. Keach**.

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If you have any questions concerning the statistics in this report, call 301-457-4817.



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Introduction to the Economic Census

PURPOSES AND USES OF THE ECONOMIC CENSUS

The economic census is the major source of facts about the structure and functioning of the Nation's economy. It provides essential information for government, business, industry, and the general public.

The economic census furnishes an important part of the framework for such composite measures as the gross domestic product, input/output measures, production and price indexes, and other statistical series that measure short-term changes in economic conditions.

Policymaking agencies of the Federal Government use the data, especially in monitoring economic activity and providing assistance to business.

State and local governments use the data to assess business activities and tax bases within their jurisdictions and to develop programs to attract business.

Trade associations study trends in their own and competing industries and keep their members informed of market changes.

Individual businesses use the data to locate potential markets and to analyze their own production and sales performance relative to industry or area averages.

AUTHORITY AND SCOPE

Title 13 of the United States Code (sections 131, 191, and 224) directs the Census Bureau to take the economic census every 5 years, covering years ending in 2 and 7. The 1992 Economic Census consists of the following eight censuses:

- Census of Retail Trade
- Census of Wholesale Trade
- Census of Service Industries
- Census of Financial, Insurance, and Real Estate Industries
- Census of Transportation, Communications, and Utilities
- Census of Manufactures
- Census of Mineral Industries
- Census of Construction Industries

Special programs also cover enterprise statistics and minority-owned and women-owned businesses. (The 1992 Census of Agriculture and 1992 Census of Governments are conducted separately.) The next economic census is scheduled to be taken in 1998 covering the year 1997.

AVAILABILITY OF THE DATA

The results of the economic census are available in printed reports for sale by the U.S. Government Printing Office and on compact discs for sale by the Census Bureau. Order forms for all types of products are available on request from Customer Services, Bureau of the Census, Washington, DC 20233-8300. A more complete description of publications being issued from this census is on the inside back cover of this document.

Census facts are also widely disseminated by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. Finally, State data centers in every State as well as business and industry data centers in many States also supply economic census statistics.

WHAT'S NEW IN 1992

The 1992 Economic Census covers more of the economy than any previous census. New for 1992 are data on communications, utilities, financial, insurance, and real estate, as well as coverage of more transportation industries. The economic, agriculture, and governments censuses now collectively cover nearly 98 percent of all economic activity.

Among other changes, new 1992 definitions affect the boundaries of about a third of all metropolitan areas. Also, the Survey of Women-Owned Businesses has now been expanded to include all corporations.

HISTORICAL INFORMATION

The economic census has been taken as an integrated program at 5-year intervals since 1967 and before that for 1963, 1958, and 1954. Prior to that time, the individual subcomponents of the economic census were taken separately at varying intervals.

The economic census traces its beginnings to the 1810 Decennial Census, when questions on manufacturing were included with those for population. Coverage of economic activities was expanded for 1840 and subsequent censuses to include mining and some commercial activities. In 1902, Congress established a permanent Census Bureau and directed that a census of manufactures be taken every 5 years. The 1905 Manufactures Census was the first time a census was taken apart from the regular every-10-year population census.

The first census of business was taken in 1930, covering 1929. Initially it covered retail and wholesale trade and construction industries, but it was broadened in 1933 to include some of the service trades.

The 1954 Economic Census was the first census to be fully integrated—providing comparable census data across economic sectors, using consistent time periods, concepts, definitions, classifications, and reporting units. It was the first census to be taken by mail, using lists of firms provided by the administrative records of other Federal agencies. Since 1963, administrative records also have been used to provide basic statistics for very small firms, reducing or eliminating the need to send them census questionnaires. The Enterprise Statistics Program, which publishes combined data from the economic census, was made possible with the implementation of the integrated census program in 1954.

The range of industries covered in the economic censuses has continued to expand. The census of construction industries began on a regular basis in 1967, and the scope of service industries was broadened in 1967, 1977, and 1987. The census of transportation began in 1963 as a set of surveys covering travel, transportation of commodities, and trucks, but expanded in 1987 to cover business establishments in several transportation industries. For 1992, these statistics are incorporated into a broadened census of transportation, communications, and utilities. Also new for 1992 is the census of financial, insurance, and real estate industries. This is part of a gradual expansion in coverage of industries previously subjected to government regulation.

The Survey of Minority-Owned Business Enterprises was first conducted as a special project in 1969 and was incorporated into the economic census in 1972 along with the Survey of Women-Owned Businesses.

An economic census has also been taken in Puerto Rico since 1909, in the Virgin Islands of the United States and Guam since 1958, and in the Commonwealth of the Northern Mariana Islands since 1982.

Statistical reports from the 1987 and earlier censuses provide historical figures for the study of long-term time series and are available in some large libraries. All of the census data published since 1967 are still available for sale on microfiche from the Census Bureau.

AVAILABILITY OF MORE FREQUENT ECONOMIC DATA

While the census provides complete enumerations every 5 years, there are many needs for more frequent data as well. The Census Bureau conducts a number of monthly, quarterly, and annual surveys, with the results appearing in publication series such as Current Business Reports (retail and wholesale trade and service industries), the Annual Survey of Manufactures, Current Industrial Reports, and the Quarterly Financial Report. Most of these surveys, while providing more frequent observations, yield less kind-of-business and geographic detail than the census. The County Business Patterns program offers annual statistics on the number of establishments, employment, and payroll classified by industry within each county.

SOURCES FOR MORE INFORMATION

More information about the scope, coverage, classification system, data items, and publications for each of the economic censuses and related surveys is published in the *Guide to the 1992 Economic Census and Related Statistics*. More information on the methodology, procedures, and history of the census will be published in the *History of the 1992 Economic Census*. Contact Customer Services for information on availability.

Census of Manufactures

GENERAL

This report, from the 1992 Census of Manufactures, is one of a series of 83 industry reports, each of which provides statistics for individual industries or groups of related industries. Additional separate reports will be issued for each State and the District of Columbia and for special subjects such as manufacturers' shipments to the federal government and concentration ratios in manufacturing.

The industry reports include such statistics as number of establishments, employment, payroll, value added by manufacture, cost of materials consumed, capital expenditures, product shipments, etc.

State reports present similar statistics for each State and its important metropolitan areas (MA's), counties, and places. Selected statistical totals for "all manufacturing" have been shown in the State reports for MA's with 250 employees or more and for counties and places with 500 employees or more.

The *General Summary* report contains industry, product class, and geographic area statistics summarized in one report. The introduction to the *General Summary* discusses, at greater length, many of the subjects described in this introduction. For example, the *General Summary* text discusses the relationship of value added by manufacture to national income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

SCOPE OF CENSUS AND DEFINITION OF MANUFACTURING

The 1992 Census of Manufactures covers all establishments with one paid employee or more primarily engaged in manufacturing as defined in the *1987 Standard Industrial Classification (SIC) Manual*¹. This is the system of industrial classification developed by experts on classification in Government and private industry under the guidance of the Office of Information and Regulatory Affairs, Office of

¹*Standard Industrial Classification Manual: 1987*. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

Management and Budget. This classification system is used by Government agencies as well as many organizations outside the Government.

The SIC Manual defines manufacturing as the mechanical or chemical transformation of substances or materials into new products. The assembly of component parts of products also is considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials-handling equipment.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

RELATIONSHIP BETWEEN ANNUAL SURVEY OF MANUFACTURES AND CENSUS OF MANUFACTURES

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is a probability-based sample of approximately 62,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, costs of purchased services, and foreign content of materials consumed. Except for supplemental labor costs, the extra ASM items are collected only in census years.

ESTABLISHMENT BASIS OF REPORTING

The census of manufactures is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each

location. The ASM also is conducted on an establishment basis, but separate reports are filed for just those establishments selected in the sample. Companies engaged in distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1992, as in earlier years, a minimum size limit was set for inclusion of establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company (see Auxiliaries).

MANUFACTURING UNIVERSE AND CENSUS REPORT FORMS

The 1992 Census of Manufactures universe includes approximately 380,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in the publication are described below:

1. **Small single-establishment companies not sent a report form.** In the 1992 Census of Manufactures, approximately 143,000 small single-establishment companies were excused from filing reports. Selection of these small establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of Federal agencies. The cutoffs were selected so that these administrative-records cases would account for no more than 3 percent of the value of shipments for all manufacturing. Generally, all single-establishment companies with less than 5 employees were excused, while all establishments with more than 20 employees were mailed forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information. The value of shipments and cost of materials

were not distributed among specific products and materials for these establishments but were included in the product and material "not specified by kind" (n.s.k.) categories.

The industry classification codes included in the administrative-records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded at the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative-records cases were only given a two- or three-digit SIC group. For the 1992 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassification has no significant effect on the statistics other than on the number of companies and establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

2. **Establishments sent a report form.** The over 237,000 establishments covered in the mail canvass were divided into three groups:

- a. **ASM sample establishments.** This group consisted of approximately 62,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see Appendix B, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. See appendix A, section 2, for an explanation of these items.

The census part of the report form is 1 of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of these many forms to canvass the 459 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space also was provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant material not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

- b. **Large and medium establishments (non-ASM).** Approximately 112,000 establishments were included in this group. A variable cutoff, based on administrative-records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive 1 of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.
- c. **Small single-establishment companies (non-ASM).** This group consisted of approximately 63,000 establishments. For those industries where application of the variable cutoff for administrative-records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received 1 of the approximately 80 versions of the short form, which requested summary product and

material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics; the same data were collected on the short form as on the long form. However, detailed information on materials consumed was not collected on the short form; thus its use would increase the value of the n.s.k. categories.

AUXILIARIES

In this industry report, the data on employment and payroll are limited to operating manufacturing establishments. The census report form filed for auxiliaries (ES-9200) requested a description of the activity of the establishments serviced. However, the manufacturing auxiliaries were coded only to the two-digit major group of the establishments they served; whereas, the operating establishments were coded to a four-digit manufacturing industry. Data for the approximately 11,000 separately operated auxiliaries are included in the geographic area series and in a report issued as part of the 1992 Enterprise Statistics Survey.

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two establishments or more. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include the following:

1. Program planning, including sales research and coordination of purchasing, production, and distribution
2. Company purchasing, including general contracts and purchasing methods
3. Company financial policy and accounting
4. General engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations
5. Company personnel matters
6. Legal and patent matters

Other types of auxiliaries serving the plants or central management of the company include purchasing offices, sales promotion offices, research and development organizations, etc.

INDUSTRY CLASSIFICATION OF ESTABLISHMENTS

Each of the establishments covered in the census was classified in 1 of 459 manufacturing industries in accordance with the industry definitions in the 1987 SIC Manual. The 1987 edition of this manual represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. Appendix A of the 1987 Manual notes the revisions in the four-digit industry levels between 1972/77 and 1987.

An industry is generally defined as a group of establishments producing the same product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively become narrower with successive additions of numerical digits. For 1992, there are 20 major groups (two-digit SIC), 139 industry groups (three-digit SIC), and 459 industries (four-digit SIC). This represents an expansion of four-digit industries from 452 in 1972/77 and a reduction of three-digit groups from 143 in 1972/77. Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 11,000 products identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in operations. Refining of nonferrous metals from ore or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or if the change has occurred for 2 successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see Appendix B, Annual Survey of Manufactures). However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The results of these rules covering the switching of plants from one industry classification to another are that, at the aggregate level, some industries comprise different mixes of establishments between survey years and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is particularly true for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-records cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of companies and establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.) shown in tables 1a through 5a, therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities. The product statistics in table 6a represent the output of all establishments whether or not they are classified in the same industry as the product. For this reason, in relating the industry statistics, especially the value of shipments to the product statistics, the composition of the industry's output shown in table 5b should be considered.

The extent to which industry and product statistics may be matched with each other is measured by two ratios which are computed from the figures shown in table 5b. The first of these ratios, called the primary product specialization ratio, measures the proportion of product shipments (both primary and secondary) of the establishments classified in the industry represented by the primary products of those establishments. The second ratio, called the coverage ratio, is the proportion of primary products shipped by the establishments classified in the industry to total shipments of such products by all manufacturing establishments.

However, establishments making products falling into the same industry category may use a variety of processes and materials to produce them. Also, the same industry classification (based on end products) may include both establishments that are highly integrated and those that

put only the finishing touches on an already highly fabricated item. For example, the refrigeration equipment industry includes instances of almost complete integration (production of the compressor, condensing unit, electric motor, casting, stamping of the case, and final assembly) all carried on at one plant. On the other hand, the condensing unit, the motor, and the case may be purchased and only assembled into the finished product.

In some instances, separate industry categories have been established for integrated and nonintegrated establishments. For other industries, the census provides separate statistics on the production of intermediate commodities made and used in the producing plant. For some industries characterized by many plants of the same company, separate figures on interplant transfers of products usually are shown.

Differences in the integration of production processes, types of operations, and alternatives in types of materials used should be considered when relating the industry statistics (employment, payrolls, value added, etc.) to the product and material data.

VALUE OF SHIPMENTS FOR THE INDUSTRY COMPARED WITH VALUE OF PRODUCT SHIPMENTS

This report shows value of shipments data for industries and products. In tables 1a through 5b, these data represent the total value of shipments of all establishments classified in a particular industry. The data include the shipments of the products classified in the industry (primary to the industry), products classified in other industries (secondary to the industry), and miscellaneous receipts (repair work, sale of scrap, research and development, installation receipts, and resales). Value of product shipments shown in table 6a represents the total value of all products shipped that are classified as primary to an industry.

CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this information may be released even though other information is withheld.

The disclosure analysis for the industry statistics in tables 1a through 5a of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line is suppressed except for new capital expenditures. However, the suppressed data are included in higher-level totals. A separate disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

SPECIAL TABULATIONS

Special tabulations of data collected in the 1992 Census of Manufactures may be obtained on computer diskette or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Manufacturing and Construction Division, Bureau of the Census, Washington, DC 20233.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

- Represents zero.
- (D) Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
- (NA) Not available.
- (NC) Not comparable.
- (S) Withheld because estimate did not meet publication standards.
- (X) Not applicable.
- (Z) Less than half the unit shown.
- n.e.c. Not elsewhere classified.
- n.s.k. Not specified by kind.
- pt. Part.
- r Revised.
- SIC Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

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SIC's 357, 36-39	Bruce Goldhirsch	301-457-4817
Import/ export publications	Foreign Trade Division	301-457-3041
Industry analysis and forecasting	International Trade Administration	202-377-4356

Users' Guide for Locating Statistics in This Report by Table Number

[For explanation of terms, see appendixes]

Item	Four-digit industry statistics							Five-digit product class and seven-digit product statistics			
	Historical	Operating ratios	By geographic area	Summary and supplemental	By employment size	By industry and product class specialization	Materials consumed by kind	Industry-product analysis	Product shipments	Product class by geographic area	Historical product class
Number of companies	1a			3a					*6a		
Number of establishments.	1a		2	3a	4	5a					
Employment and payroll:											
Number of employees	1a	1b	2	3a	4	5a					
Payroll	1a	1b	2	3a	4	5a					
Supplemental labor costs				3a							
Production workers	1a	1b	2	3a	4	5a					
Production-worker hours	1a	1b	2	3a	4	5a					
Production-worker wages	1a	1b	2	3a	4	5a					
Shipments, cost of materials, and value added:											
Value of shipments (four-digit)	1a	1b	2	3a	4	5a		5b			
Product class shipments (five-digit)									6a	6b	6c
Product shipments (seven-digit)									6a		
Value added by manufacture	1a	1b	2	3a	4	5a					
Cost of materials	1a	1b	2	3a	4	5a					
Fuels and electric energy				3a							
Materials consumed by kind							7				
Inventories:											
Total, end of year	1a			3a	4						
By stage of fabrication				3a							
Capital expenditures, assets, rental payments, and purchased services:											
New capital expenditures	1a		2	3b	4	5a					
Used plant and equipment expenditures				3b							
Gross assets				3b							
Depreciation				3b							
Retirements of buildings and machinery				3b							
Rental payments				3b							
Foreign content of materials consumed				3c							
Purchased services				3c							
Ratios:											
Specialization	1a							5b			
Coverage	1a							5b			

*Number of companies with shipments of more than \$100 thousand.

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Aerospace Equipment, Including Parts

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Description of Industries and Summary of Findings

This report shows 1992 Census of Manufactures statistics for establishments classified in each of the following industries:

SIC code and title

3721	Aircraft
3724	Aircraft Engines and Engine Parts
3728	Aircraft Parts and Equipment, N.E.C.
3761	Guided Missiles and Space Vehicles
3764	Space Propulsion Units and Parts
3769	Space Vehicle Equipment, N.E.C.

The industry statistics (employment, payroll, cost of materials, value of shipments, inventories, etc.) are reported for each establishment as a whole. Aggregates of such data for an industry reflect not only the primary activities of the establishments but also their activities in the manufacture of secondary products as well as their miscellaneous activities (contract work on materials owned by others, repair work, etc.). This fact should be taken into account in comparing industry statistics (tables 1 through 5a) with product statistics (table 6) showing shipments by all industries of the primary products of the specified industry. The extent of the "product mix" is indicated in table 5b, which shows the value of primary and secondary products shipped by establishments classified in the specified industry and the value of primary products of the industry shipped as secondary products by establishments classified in other industries.

Establishment data were tabulated based on industry definitions included in the *1987 Standard Industrial Classification (SIC) Manual*¹. The 1987 edition represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. In addition to the 1987 SIC revision, changes were made to the product class (five-digit) and product code (seven-digit) categories. The product class and product code comparability between the 1992 and 1987 censuses is shown in appendix C. This appendix presents, in tabular form, the linkage from 1992 to 1987, and 1987 to 1992.

¹*Standard Industrial Classification Manual: 1987*. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

INDUSTRY 3721, AIRCRAFT

This industry is made up of establishments primarily engaged in manufacturing or assembling complete aircraft. This industry also includes establishments owned by aircraft manufacturers and primarily engaged in research and development on aircraft, whether from enterprise funds or on a contract or fee basis. Also included are establishments engaged in repairing and rebuilding aircraft on a factory basis. Establishments primarily engaged in manufacturing engines and other aircraft parts and auxiliary equipment are classified in industry 3724 and 3728; and those manufacturing guided missiles and space vehicles and parts are classified in industry group 376. Establishments primarily engaged in the repair of aircraft, except on a factory basis, are classified in transportation, industry 4581; and research and development on aircraft by establishments not owned by aircraft manufacturers are classified in services, industry 8731. Products of this industry also are collected in the Current Industrial Report (CIR) M-37G, Civil Aircraft and Aircraft Engines. For information regarding the CIR, see Contacts for Data Users at the end of the Census of Manufactures section.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 3721, Aircraft, had employment of 264.9 thousand. The employment figure was 1 percent below the 268.2 thousand reported in 1987. Compared with 1991, employment increased 3 percent. The 1991 data are based on the Census Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The leading States in employment in 1992 were California, Missouri, Texas, and Washington. These same States were the leaders in 1987.

The total value of shipments for establishments classified in this industry was \$63.0 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous

receipts, such as resales and contract receipts. Industry 3721 shipped \$54.9 billion of aircraft products considered primary to the industry, \$7.0 billion of secondary products, and had \$1.1 billion of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 89 percent (specialization ratio). In 1987, the specialization ratio was 90 percent.

Establishments in this industry also accounted for 97 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 95 percent.

The products primary to industry 3721, no matter in what industry they were produced, appear in table 6a and aggregate to \$56.6 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the aircraft industry amounted to \$36.1 billion. Data on specific materials consumed appear in table 7.

No establishments in this industry were excluded from the mail portion of the census. However, for a small number of establishments, reports were not received at the time the data were tabulated. For these establishments data were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for less than 1 percent of the total value of shipments.

INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS

This industry is made up of establishments primarily engaged in manufacturing aircraft engines and engine parts. This industry also includes establishments owned by aircraft engine manufacturers and primarily engaged in research and development on aircraft engines and engine parts whether from enterprise funds or on a contract or fee basis. Also included are establishments engaged in repairing and rebuilding aircraft engines on a factory basis. Establishments primarily engaged in manufacturing guided missile and space vehicle propulsion units and parts are classified in industry 3764; those manufacturing aircraft intake and exhaust valves and pistons are classified in industry 3592; and those manufacturing aircraft internal combustion engine filters are classified in industry 3714. Establishments primarily engaged in the repair of aircraft engines, except on a factory basis, are classified in transportation, industry 4581; and research and development on aircraft engines on a contract or fee basis by establishments not owned by aircraft engine manufacturers are classified in services, industry 8731. Products of this industry also are collected in the Current Industrial Report (CIR) M-37G, Civil Aircraft and Aircraft Engines. For information regarding the CIR, see Contacts for Data Users at the end of the Census of Manufactures section.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 3724, Aircraft Engines and Engine Parts, had employment of 116.7 thousand. The employment figure was 16 percent below the 139.6 thousand reported in 1987. Compared with 1991, employment decreased 5 percent. The 1991 data are based on the Census Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The leading States in employment in 1992 were Connecticut, Florida, Indiana, and Ohio. This represents a shift from 1987 when Connecticut, Ohio, Massachusetts, and Florida were the leading States.

The total value of shipments for establishments classified in this industry was \$22.0 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3724 shipped \$19.5 billion of aircraft engines and engine parts considered primary to the industry, \$1.2 billion of secondary products, and had \$1.2 billion of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 94 percent (specialization ratio). In 1987, the specialization ratio was 92 percent.

Establishments in this industry also accounted for 95 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 94 percent.

The products primary to industry 3724, no matter in what industry they were produced, appear in table 6a and aggregate to \$20.6 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the aircraft engines and engine parts industry amounted to \$9.0 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 2 percent of the total value of shipments.

INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.

This industry is made up of establishments primarily engaged in manufacturing aircraft parts and auxiliary equipment, not elsewhere classified. This industry also includes

establishments owned by manufacturers of aircraft parts and auxiliary equipment and primarily engaged in research and development on aircraft parts, whether from enterprise funds or on a contract or fee basis. Establishments primarily engaged in manufacturing or assembling complete aircraft are classified in industry 3721; those manufacturing aircraft engines and parts are classified in industry 3724; those manufacturing aeronautical instruments are classified in industry 3812; those manufacturing aircraft engine electrical (aeronautical electrical) equipment are classified in industry 3694; and those manufacturing guided missile and space vehicle parts and auxiliary equipment are classified in industry 3769. Establishments not owned by manufacturers of aircraft parts but primarily engaged in research and development on aircraft parts on a contract or fee basis are classified in services, industry 8731.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 3728, Aircraft Parts and Equipment, N.E.C., had employment of 165.3 thousand. The employment figure was 12 percent below the 188.2 thousand reported in 1987. Compared with 1991, employment decreased 12 percent. The 1991 data are based on the Census Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The leading States in employment in 1992 were California, Connecticut, Kansas, and Texas. These same States were the leaders in 1987.

The total value of shipments for establishments classified in this industry was \$19.8 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3728 shipped \$16.5 billion of aircraft parts and equipment, not elsewhere classified products considered primary to the industry, \$2.9 billion of secondary products, and had \$505.8 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 85 percent (specialization ratio). In 1987, the specialization ratio was 82 percent.

Establishments in this industry also accounted for 74 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 71 percent.

The products primary to industry 3728, no matter in what industry they were produced, appear in table 6a and aggregate to \$22.1 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the aircraft parts and equipment, not elsewhere classified, industry amounted to \$6.1 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 4 percent of the total value of shipments.

INDUSTRY 3761, GUIDED MISSILES AND SPACE VEHICLES

This industry is made up of establishments primarily engaged in manufacturing complete guided missiles and space vehicles. This industry also includes establishments owned by guided missile and space vehicle manufacturers and primarily engaged in research and development on these products, whether from enterprise funds or on a contract or fee basis. Establishments primarily engaged in manufacturing guided missile and space vehicle propulsion units and propulsion unit parts are classified in industry 3764; those manufacturing space satellites are classified in industry 3669; those manufacturing guided missile and space vehicle airborne and ground guidance, checkout, and launch electronic systems and components are classified in industry 3812; and those manufacturing guided missile and space vehicle airframes, nose cones, and space capsules are classified in industry 3769. Research and development on guided missiles and space vehicles, on a contract or fee basis, by establishments not owned by guided missile or space vehicle manufacturers are classified in services, industry 8731.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 3761, Guided Missiles and Space Vehicles, had employment of 100.1 thousand. The employment figure was 40 percent below the 166.7 thousand reported in 1987. Compared with 1991, employment decreased 26 percent. The 1991 data are based on the Census Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The leading States in employment in 1992 were Arizona, California, Colorado, and Texas. This represents a shift from 1987 when California, Washington, Colorado, and Arizona were the leading States.

The total value of shipments for establishments classified in this industry was \$19.7 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3761 shipped \$13.4 billion of guided missiles and space vehicles considered primary to the industry.

Establishments in this industry also accounted for 97 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 93 percent.

The products primary to industry 3761, no matter in what industry they were produced, appear in table 6a and aggregate to \$13.8 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the guided missiles and space vehicles industry amounted to \$6.8 billion. Data on specific materials consumed appear in table 7.

No establishments in this industry were excluded from the mail portion of the census. However, for a small number of establishments, reports were not received at the time the data were tabulated. For these establishments data were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for less than 1 percent of the total value of shipments.

INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS

This industry is made up of establishments primarily engaged in manufacturing guided missile propulsion units and propulsion unit parts. This industry also includes establishments owned by manufacturers of guided missile and space vehicle propulsion units and parts and primarily engaged in research and development on such products, whether from enterprise funds or on a contract or fee basis. Research and development on guided missile and space propulsion units, on a contract or fee basis by establishments not owned by manufacturers of guided missile and space vehicle propulsion units and parts, are classified in services, industry 8731.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 3764, Space Propulsion Units and Parts, had employment of 32.3 thousand. The employment figure was 2 percent above the 31.8 thousand reported in 1987. Compared with 1991, employment increased 17 percent. The 1991 data are based on the Census Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The leading States in employment in 1992 were California, Florida, Utah, and Virginia. This represents a shift from 1987 when California, Utah, Michigan, and Alabama were the leading States.

The total value of shipments for establishments classified in this industry was \$5.3 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous

receipts, such as resales and contract receipts. Industry 3764 shipped \$4.7 billion of space propulsion units and parts considered primary to the industry, \$433.3 million of secondary products, and had \$212.9 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 92 percent (specialization ratio). In 1987, the specialization ratio was 83 percent.

Establishments in this industry also accounted for 86 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 82 percent.

The products primary to industry 3764, no matter in what industry they were produced, appear in table 6a and aggregate to \$5.4 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the space propulsion units and parts industry amounted to \$2.2 billion. Data on specific materials consumed appear in table 7.

No establishments in this industry were excluded from the mail portion of the census. However, for a small number of establishments, reports were not received at the time the data were tabulated. For these establishments data were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 1 percent of the total value of shipments.

INDUSTRY 3769, SPACE VEHICLE EQUIPMENT, N.E.C.

This industry is made up of establishments primarily engaged in manufacturing guided missile and space vehicle parts and auxiliary equipment, not elsewhere classified. This industry also includes establishments owned by manufacturers of guided missile and space vehicle parts and auxiliary equipment, not elsewhere classified, and primarily engaged in research and development on such products, whether from enterprise funds or on a contract or fee basis. Establishments primarily engaged in manufacturing navigational and guidance systems are classified in industry 3812. Research and development on guided missile and space vehicle parts, on a contract or fee basis by establishments not owned by manufacturers of such products, are classified in services, industry 8731.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 3769, Space Vehicle Equipment, N.E.C., had employment of 17.2 thousand. The employment figure was 14 percent above the 15.1 thousand reported in 1987. Compared with 1991,

employment increased 21 percent. The 1991 data are based on the Census Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The leading States in employment in 1992 were California, Louisiana, Maryland, and Pennsylvania. This represents a shift from 1987 when Washington, Louisiana, California, and Arizona were the leading States.

The total value of shipments for establishments classified in this industry was \$2.1 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 3769 shipped \$1.8 billion of space vehicle equipment, not elsewhere classified, products considered primary to the industry, \$261.3 million of secondary products, and had \$21.4 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 87 percent (specialization ratio). In 1987, the specialization ratio was 81 percent.

Establishments in this industry also accounted for 40 percent of products considered primary to the industry no

matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was not shown.

The products primary to industry 3769, no matter in what industry they were produced, appear in table 6a and aggregate to \$4.5 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the space vehicle equipment, not elsewhere classified industry amounted to \$643.8 million. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 2 percent of the total value of shipments.

Table 1a. Historical Statistics for the Industry: 1992 and Earlier Years—Con.

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year ¹	All establishments ³			All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments (million dollars)	New capital expenditures ⁶ (million dollars)	End-of-year inventories ⁴ (million dollars)	Ratios	
	Companies ² (no.)	Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Specialization ⁷ (per cent)	Coverage ⁸ (per cent)
INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS—Con.															
1978 ASM-----	(NA)	(NA)	(NA)	20.1	414.1	8.4	17.5	140.1	764.2	343.2	1 113.8	27.6	140.2	(NA)	(NA)
1977 Census ---	18	25	24	18.6	356.6	7.1	14.9	111.5	620.7	316.4	945.5	25.3	167.5	92	88
INDUSTRY 3769, SPACE VEHICLE EQUIPMENT, N.E.C.															
1992 Census ---	54	60	37	17.2	694.5	7.7	15.0	271.4	1 456.4	643.8	2 070.7	41.0	331.5	87	40
1991 ASM-----	(NA)	(NA)	(NA)	14.2	558.2	7.7	14.5	266.2	1 206.4	752.5	1 907.3	31.4	303.3	(NA)	(NA)
1990 ASM-----	(NA)	(NA)	(NA)	14.4	525.5	8.0	15.3	254.2	1 089.7	612.4	1 715.6	28.0	231.8	(NA)	(NA)
1989 ASM-----	(NA)	(NA)	(NA)	18.4	675.4	9.1	17.8	294.8	1 209.6	560.6	1 768.3	64.2	204.8	(NA)	(NA)
1988 ASM-----	(NA)	(NA)	(NA)	19.4	686.5	9.5	18.8	290.8	1 267.7	540.0	1 799.6	59.8	195.5	(NA)	(NA)
1987 Census ---	61	66	43	15.1	524.8	7.9	15.6	237.8	869.9	313.7	1 182.2	62.3	133.2	81	(D)
1986 ASM-----	(NA)	(NA)	(NA)	22.1	763.5	10.4	20.6	290.1	1 686.6	519.3	2 169.7	68.7	212.1	(NA)	(NA)
1985 ASM-----	(NA)	(NA)	(NA)	33.7	1 141.8	19.3	39.1	586.1	2 652.0	936.3	3 539.8	153.3	292.7	(NA)	(NA)
1984 ASM-----	(NA)	(NA)	(NA)	26.7	905.6	15.5	34.1	463.1	2 737.5	836.2	3 502.0	125.0	245.9	(NA)	(NA)
1983 ASM-----	(NA)	(NA)	(NA)	24.4	735.4	13.5	27.7	353.2	1 728.3	579.1	2 264.0	85.0	171.2	(NA)	(NA)
1982 Census ---	45	49	33	21.4	584.6	13.0	26.2	304.5	1 297.1	645.1	1 958.3	72.4	120.4	62	46
1981 ASM-----	(NA)	(NA)	(NA)	17.9	437.1	9.3	22.0	224.3	992.6	533.1	1 522.0	40.1	88.5	(NA)	(NA)
1980 ASM-----	(NA)	(NA)	(NA)	8.7	200.6	4.4	8.9	79.3	351.3	177.5	525.3	10.7	35.1	(NA)	(NA)
1979 ASM-----	(NA)	(NA)	(NA)	9.5	188.6	5.3	10.6	78.7	309.7	146.1	453.3	10.7	27.7	(NA)	(NA)
1978 ASM-----	(NA)	(NA)	(NA)	8.2	163.3	4.2	8.5	63.5	225.7	143.3	370.6	10.7	27.7	(NA)	(NA)
1977 Census ---	41	42	25	7.2	139.2	3.9	8.3	55.3	236.3	110.1	339.4	13.3	29.8	85	(D)

¹In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1977, see 1977 Census of Manufactures, vol. II, table 1 of the industry chapter.

²For the Census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

³Includes establishments with payroll at any time during the year.

⁴Beginning in 1982, all respondents were requested to report their inventories at cost or market prior to adjustment to LIFO cost. This is a change from prior years when respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, 1982 data for inventories and value added by manufacture are not comparable to prior-year data.

⁵Cost of materials is the sum of five components: the cost of (1) parts used in the manufacture of finished goods (materials, parts, containers, and supplies incorporated into products or otherwise directly consumed in the process); (2) purchased items later resold without further manufacture; (3) fuels; (4) electricity; and (5) commissions or fees to outside parties for contract manufacturing. A separate cost for each of the five components is shown in table 3a. Detailed data on materials consumed by type, are shown in table 7.

⁶Detailed data on new machinery and equipment expenditures are provided in table 3c.

⁷Represents ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for establishments classified in the industry.

⁸Represents ratio of primary products shipped by establishments classified in industry to total shipments of such products by all manufacturing establishments, wherever classified.

Table 1b. Selected Operating Ratios for the Industry: 1992 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3721, AIRCRAFT									
1992 Census-----	43 408	46	1 859	19.98	57	76	94 968	46	110.82
1991 ASM-----	39 969	49	1 954	17.82	62	80	89 395	45	94.32
1990 ASM-----	38 800	48	1 919	17.02	65	86	69 946	55	75.48
1989 ASM-----	37 725	51	1 939	16.40	69	93	73 382	51	74.87
1988 ASM-----	36 525	51	1 959	16.16	63	87	66 443	55	66.42
1987 Census-----	36 091	53	1 995	15.38	59	84	64 545	56	61.32
1986 ASM-----	34 998	53	1 992	14.71	58	82	59 060	59	56.25
1985 ASM-----	33 113	50	1 957	14.60	50	73	70 704	47	71.65
1984 ASM-----	32 073	50	1 976	14.05	57	84	62 788	51	63.97
1983 ASM-----	30 139	48	1 981	13.60	49	74	55 849	54	58.65
1982 Census-----	28 149	50	1 964	12.92	56	84	56 859	50	57.46
1981 ASM-----	26 419	52	1 994	11.59	52	79	51 441	51	49.64
1980 ASM-----	23 719	55	2 000	10.14	55	80	51 945	46	47.10
1979 ASM-----	20 934	56	2 012	9.05	55	80	44 526	47	39.23
1978 ASM-----	20 009	57	1 987	8.38	51	79	38 370	52	34.07
1977 Census-----	17 853	53	1 955	7.59	45	72	36 525	49	34.96
INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS									
1992 Census-----	41 574	55	2 037	16.97	41	63	98 075	42	87.50
1991 ASM-----	39 428	55	2 104	15.56	44	66	100 393	39	86.71
1990 ASM-----	37 439	56	2 036	15.68	45	66	93 481	40	81.59
1989 ASM-----	35 682	58	2 041	14.81	45	67	89 458	40	75.94
1988 ASM-----	35 281	54	2 152	14.29	45	70	78 907	45	67.50
1987 Census-----	34 484	57	2 083	14.23	45	69	83 814	41	70.40
1986 ASM-----	34 417	59	2 100	13.86	44	68	84 636	41	68.78
1985 ASM-----	33 594	59	2 074	13.41	46	72	71 350	47	58.04
1984 ASM-----	31 057	59	2 102	12.41	45	70	71 720	43	58.18
1983 ASM-----	29 069	57	2 045	12.79	44	69	63 280	46	54.33
1982 Census-----	27 119	59	2 013	11.81	45	71	57 936	47	49.17
1981 ASM-----	25 449	59	1 981	11.50	51	77	49 221	52	41.97
1980 ASM-----	22 891	61	2 042	9.89	48	74	49 486	46	39.94
1979 ASM-----	20 947	60	2 100	8.89	45	74	44 446	47	35.10
1978 ASM-----	19 926	60	2 095	8.18	47	77	38 366	52	30.45
1977 Census-----	18 279	59	2 063	7.54	44	75	33 922	54	27.97

Table 1b. Selected Operating Ratios for the Industry: 1992 and Earlier Years—Con.

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.									
1992 Census	37 278	57	2 076	16.44	31	62	76 446	49	65.04
1991 ASM	35 983	57	2 100	15.05	34	65	73 025	49	60.60
1990 ASM	34 693	56	2 024	14.89	40	73	63 842	54	55.96
1989 ASM	34 235	53	2 071	14.55	39	74	65 927	52	59.51
1988 ASM	32 955	54	2 126	13.85	38	72	61 418	54	53.19
1987 Census	32 395	75	1 553	13.79	36	70	62 652	52	54.06
1986 ASM	32 040	56	2 081	13.50	35	69	63 327	51	53.93
1985 ASM	30 846	57	2 102	13.06	37	70	61 024	51	50.69
1984 ASM	29 936	54	2 079	12.68	40	73	58 545	51	52.55
1983 ASM	28 177	54	2 004	12.29	40	73	54 291	52	50.37
1982 Census	25 824	55	1 995	11.26	39	73	46 597	55	42.21
1981 ASM	23 185	60	2 061	10.03	39	76	40 741	57	32.95
1980 ASM	21 457	60	2 037	9.30	44	80	38 154	56	31.36
1979 ASM	19 203	61	2 013	8.28	42	78	34 478	56	28.03
1978 ASM	18 299	58	1 970	7.87	40	77	32 125	57	27.99
1977 Census	16 718	58	1 937	7.28	37	73	29 396	57	26.37
INDUSTRY 3761, GUIDED MISSILES AND SPACE VEHICLES									
1992 Census	47 175	31	1 835	22.23	35	59	110 698	43	191.71
1991 ASM	44 370	33	2 029	19.07	35	61	99 786	44	148.42
1990 ASM	43 166	35	2 015	18.25	38	65	101 040	43	144.53
1989 ASM	41 317	35	1 968	17.53	39	69	89 690	46	130.86
1988 ASM	40 159	36	1 971	17.19	37	67	89 344	45	124.99
1987 Census	38 481	38	1 936	16.64	31	61	90 418	43	124.16
1986 ASM	36 172	36	1 935	15.72	34	63	81 060	45	114.90
1985 ASM	35 472	35	1 981	14.10	34	64	81 508	44	118.87
1984 ASM	34 068	36	1 982	13.89	32	63	83 102	41	116.02
1983 ASM	31 340	39	1 885	13.86	34	63	74 623	42	102.62
1982 Census	31 721	36	1 964	12.99	36	67	70 537	45	99.65
1981 ASM	28 939	32	1 935	12.16	32	67	57 208	51	93.16
1980 ASM	27 141	34	2 052	10.66	33	68	54 675	50	77.54
1979 ASM	24 725	38	1 952	10.15	32	68	48 241	51	64.94
1978 ASM	22 625	36	1 961	9.52	31	67	44 527	51	63.76
1977 Census	20 548	37	1 903	9.01	32	68	37 923	54	53.21
INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS									
1992 Census	46 303	41	1 560	23.74	41	69	87 276	53	134.88
1991 ASM	42 116	34	1 863	19.05	34	66	84 686	50	132.53
1990 ASM	39 384	36	1 679	18.87	36	67	81 212	48	135.51
1989 ASM	39 447	35	1 708	19.51	38	70	81 750	48	135.50
1988 ASM	38 295	36	1 960	17.15	37	72	72 640	53	103.81
1987 Census	36 940	35	1 982	15.77	36	70	72 774	51	104.24
1986 ASM	34 701	36	1 991	15.25	38	73	62 869	55	88.52
1985 ASM	34 705	38	2 168	13.87	39	72	63 077	55	76.72
1984 ASM	31 996	41	2 179	12.05	34	67	65 741	49	72.70
1983 ASM	30 754	42	2 034	12.86	34	67	61 380	50	71.18
1982 Census	29 134	43	2 167	11.24	33	66	60 632	48	65.56
1981 ASM	26 210	40	2 150	10.40	33	69	50 142	52	58.21
1980 ASM	23 816	42	2 093	9.75	33	69	45 102	53	50.89
1979 ASM	22 225	43	2 135	8.25	32	71	38 581	58	41.78
1978 ASM	20 602	42	2 083	8.01	31	68	38 020	54	43.67
1977 Census	19 172	38	2 099	7.48	33	71	33 371	57	41.66
INDUSTRY 3769, SPACE VEHICLE EQUIPMENT, N.E.C.									
1992 Census	40 378	45	1 948	18.09	31	65	84 674	48	97.09
1991 ASM	39 310	54	1 883	18.36	39	69	84 958	46	83.20
1990 ASM	36 493	56	1 913	16.61	36	66	75 674	48	71.22
1989 ASM	36 707	49	1 956	16.56	32	70	65 739	56	67.96
1988 ASM	35 387	49	1 979	15.47	30	68	65 345	54	67.43
1987 Census	34 755	52	1 975	15.24	27	71	57 609	60	55.76
1986 ASM	34 548	47	1 981	14.08	24	59	76 317	45	81.87
1985 ASM	33 881	57	2 026	14.99	26	59	78 694	43	67.83
1984 ASM	33 918	58	2 200	13.58	24	50	102 528	33	80.28
1983 ASM	30 139	55	2 052	12.75	26	58	70 832	43	62.39
1982 Census	27 318	61	2 015	11.62	33	63	60 612	45	49.51
1981 ASM	24 419	52	2 366	10.20	35	64	55 453	44	45.12
1980 ASM	23 057	51	2 023	8.91	34	72	40 379	57	39.47
1979 ASM	19 853	56	2 000	7.42	32	74	32 600	61	29.22
1978 ASM	19 915	51	2 024	7.47	39	83	27 524	72	26.55
1977 Census	19 333	54	2 128	6.66	32	73	32 819	59	28.47

Note: For qualifications of data, see footnotes on table 1a.

Table 2. Industry Statistics for Selected States: 1992 and 1987

[Excludes data for auxiliaries. States with 100 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1992											1987		
	E1	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 3721, AIRCRAFT														
United States	—	182	103	264.9	11 498.9	122.1	227.0	4 536.5	25 157.1	36 133.3	62 980.8	1 661.3	268.2	17 311.0
Alabama	—	6	6	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	7.1	F	(D)
Arizona	—	8	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Arkansas	—	6	3	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
California	—	36	19	58.9	2 748.0	30.8	52.8	1 242.5	4 824.1	7 609.0	13 015.6	178.1	62.1	3 596.8
Connecticut	—	7	6	J	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Florida	—	16	9	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	149.9
Georgia	—	7	6	J	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Kansas	—	7	6	J	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Maryland	—	3	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Michigan	—	3	2	.1	3.7	.1	.2	2.1	1.9	3.5	6.9	(D)	(NA)	(NA)
Missouri	—	1	1	J	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
New York	—	3	3	J	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Ohio	—	6	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Oklahoma	—	2	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Pennsylvania	—	3	3	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
South Carolina	—	1	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
Texas	—	26	13	29.6	1 266.6	13.6	29.7	587.1	3 011.4	1 724.2	4 835.6	35.9	38.4	2 657.9
Utah	—	3	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Washington	—	8	4	L	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS														
United States	—	442	281	116.7	4 851.7	64.2	130.8	2 219.6	11 445.4	9 019.2	21 968.5	590.2	139.6	11 700.4
Alabama	—	1	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Arizona	—	18	11	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
California	—	65	38	6.9	264.6	4.3	7.9	147.3	494.6	469.8	976.0	29.0	10.2	687.8
Connecticut	—	63	46	24.0	1 124.3	13.3	28.4	518.4	2 310.6	1 907.8	4 148.6	(D)	(NA)	(D)
Florida	—	34	20	9.3	430.2	3.1	6.3	97.4	1 438.7	917.9	2 380.1	35.1	10.9	527.8
Georgia	—	10	6	1.9	63.7	1.3	2.8	41.3	151.1	123.1	287.3	(D)	G	(D)
Illinois	—	10	6	2.1	97.7	1.1	2.4	37.1	126.4	95.2	230.6	(D)	G	(D)
Indiana	—	12	9	7.9	307.3	4.3	8.9	146.1	537.5	451.0	946.2	(D)	(NA)	(D)
Iowa	—	2	2	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Kansas	—	4	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Kentucky	—	1	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Maine	—	1	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Maryland	—	2	2	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Massachusetts	—	23	18	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	26.0	(NA)	(D)
Michigan	E1	26	18	2.4	78.5	1.6	3.3	45.1	150.1	95.9	258.5	6.3	G	(D)
Minnesota	E5	3	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.1	(NA)	(D)
Missouri	—	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
New Hampshire	—	3	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
New Jersey	—	5	3	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
New Mexico	—	2	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
New York	—	21	11	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	12.9	2.4	142.3
North Carolina	—	7	4	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	8.7	G	(D)
Ohio	—	29	23	L	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Oklahoma	E1	14	6	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.7	41.9
Pennsylvania	—	13	12	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
South Carolina	—	2	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Texas	—	31	17	3.6	122.8	2.5	5.7	76.7	225.3	321.2	549.2	19.1	2.7	221.5
Vermont	—	3	2	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Virginia	—	3	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Washington	—	10	2	.3	12.6	.2	.4	8.0	26.6	20.6	49.6	1.2	.6	44.1
West Virginia	—	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Wisconsin	E4	3	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.														
United States	—	1 121	461	165.3	6 162.1	93.6	194.3	3 193.6	12 636.6	6 108.4	19 834.6	1 132.1	188.2	11 791.1
Alabama	—	9	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Arizona	—	26	13	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	15.4	4.2	301.1
Arkansas	—	14	5	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.5	F	(D)
California	—	292	129	48.2	1 851.7	24.9	51.6	821.7	3 096.6	1 928.3	5 710.0	160.5	52.7	3 145.4
Colorado	—	15	5	.9	30.2	.6	1.2	17.4	67.9	27.1	91.7	(D)	G	(D)
Connecticut	—	56	29	11.1	463.6	5.1	10.4	189.2	1 024.2	268.9	1 385.3	73.8	(NA)	(D)
Florida	E1	51	16	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	3.5	194.7
Georgia	—	9	4	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Illinois	—	14	9	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Indiana	—	20	11	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Kansas	—	70	33	J	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Louisiana	—	3	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Maryland	—	6	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Massachusetts	E6	5	1	.1	3.5	.1	.1	1.7	6.6	3.8	10.4	(D)	E	(D)
Michigan	—	34	11	1.8	63.7	1.1	2.1	32.9	127.5	103.0	232.4	(D)	(NA)	(D)

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1992 and 1987—Con.

[Excludes data for auxiliaries. States with 100 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1992											1987		
	E1	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.—Con.														
Minnesota	E2	11	3	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	4	E	(D)
Missouri	E2	25	12	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	7	36.1
Nebraska	-	2	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
New Jersey	-	20	14	1.9	61.1	1.0	2.1	28.2	138.8	87.9	229.0	(D)	G	(D)
New Mexico	-	5	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New York	-	54	24	3.2	116.1	1.7	3.6	46.3	251.0	333.7	589.7	(D)	(NA)	(D)
North Carolina	-	6	3	.3	8.5	.2	.3	3.2	15.5	9.9	27.6	(D)	F	(D)
North Dakota	-	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
Ohio	-	42	23	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Oklahoma	-	30	11	4.8	186.3	3.0	6.3	117.2	328.5	131.0	456.0	10.2	(NA)	(D)
Oregon	E1	18	4	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Pennsylvania	-	16	7	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.1	G	(D)
Tennessee	-	10	6	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	9.0	(NA)	(D)
Texas	-	83	26	18.9	680.7	10.2	17.8	327.2	1 080.6	631.9	1 626.1	48.8	16.5	1 003.7
Utah	-	14	5	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.1	52.6
Virginia	E9	3	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Washington	-	118	37	18.0	695.3	11.7	29.4	493.5	1 525.4	411.1	2 054.2	(D)	(NA)	(D)
West Virginia	-	2	2	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
INDUSTRY 3761, GUIDED MISSILES AND SPACE VEHICLES														
United States	-	38	31	100.1	4 722.2	31.5	57.8	1 284.8	11 080.9	6 788.9	19 675.1	306.7	166.7	15 072.7
Alabama	-	2	1	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Arizona	-	3	3	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Arkansas	-	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
California	-	15	12	63.5	3 065.9	10.7	21.4	410.0	6 448.9	3 708.2	11 587.8	239.5	(NA)	(D)
Colorado	-	1	1	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Florida	-	1	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Georgia	-	2	2	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Massachusetts	-	3	3	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Minnesota	-	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Missouri	-	1	1	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
New Mexico	-	2	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Ohio	-	1	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Tennessee	-	1	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Texas	-	3	2	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS														
United States	-	42	33	32.3	1 495.6	13.4	20.9	496.1	2 819.0	2 181.3	5 328.1	128.2	31.8	2 314.2
Alabama	-	2	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Arkansas	-	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
California	-	13	10	16.2	817.7	6.6	7.4	249.7	1 374.4	1 210.9	2 932.0	61.6	(NA)	(D)
Florida	-	2	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Maryland	-	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Michigan	-	1	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Ohio	-	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
South Carolina	-	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Texas	-	2	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Utah	-	4	4	I	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Virginia	E2	3	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Washington	-	1	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
West Virginia	-	1	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
INDUSTRY 3769, SPACE VEHICLE EQUIPMENT, N.E.C.														
United States	-	60	37	17.2	694.5	7.7	15.0	271.4	1 456.4	643.8	2 070.7	41.0	15.1	869.9
Alabama	-	3	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Arizona	-	5	2	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
California	E1	21	12	1.8	58.0	1.0	2.2	26.6	125.5	48.0	176.6	5.4	G	(D)
Florida	-	2	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Georgia	-	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
Indiana	-	2	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Louisiana	-	1	1	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Maine	-	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Maryland	-	2	2	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Massachusetts	-	3	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1992 and 1987—Con.

[Excludes data for auxiliaries. States with 100 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1992											1987	
	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)
	E ¹	Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)						
INDUSTRY 3769. SPACE VEHICLE EQUIPMENT, N.E.C.—Con.													
Nebraska.....	—	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New Hampshire.....	—	2	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Pennsylvania.....	—	2	2	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Tennessee.....	—	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Texas.....	—	3	2	J	8.1	(Z)	(Z)	5	11.2	2.8	14.2	(D)	(D)
Utah.....	—	1	1	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Washington.....	—	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)

Note: For qualifications of data, see footnotes on table 1a.

¹Payroll and sales data for some small single-establishment companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those States where estimated value of shipments data based on administrative-record data account for 10 percent or more of figure shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Statistics for some producing States have been withheld to avoid disclosing data for individual companies. However, for States with 100 employees or more, number of establishments is shown and employment-size range is indicated by one of the following symbols: C—100 to 249 employees; E—250 to 499 employees; F—500 to 999 employees; G—1,000 to 2,499 employees; H—2,500 to 4,999 employees; I—5,000 to 9,999 employees; J—10,000 to 24,999 employees; K—25,000 to 49,999 employees; L—50,000 to 99,999 employees; M—100,000 employees or more.

Table 3a. Summary Statistics for the Industry: 1992

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Aircraft (SIC 3721)	Aircraft engines and engine parts (SIC 3724)	Aircraft parts and equipment, n.e.c. (SIC 3728)	Guided missiles and space vehicles (SIC 3761)	Space propulsion units and parts (SIC 3764)	Space vehicle equipment, n.e.c. (SIC 3769)
Companies.....number..	151	338	1 030	23	30	54
All establishments.....number..	182	442	1 121	38	42	60
With 1 to 19 employees.....number..	79	161	660	7	9	23
With 20 to 99 employees.....number..	40	140	286	3	8	12
With 100 employees or more.....number..	63	141	175	28	25	25
Employment and labor costs:						
Employees.....1,000..	264.9	116.7	165.3	100.1	32.3	17.2
Compensation, total.....mil dol..	14 722.0	6 160.6	8 138.5	5 966.6	1 881.0	909.0
Annual payroll.....mil dol..	11 498.9	4 851.7	6 162.1	4 722.2	1 495.6	694.5
Fringe benefits.....mil dol..	3 223.0	1 308.8	1 976.4	1 244.4	385.3	214.5
Social Security and other legally required payments.....mil dol..	1 072.1	468.3	679.8	419.7	125.3	61.8
Employer voluntary payments.....mil dol..	2 151.0	840.5	1 296.7	824.7	260.1	152.7
Production workers:						
Average for year.....1,000..	122.1	64.2	93.6	31.5	13.4	7.7
March.....1,000..	127.1	66.7	98.2	33.4	14.2	8.0
May.....1,000..	123.8	65.1	95.4	32.4	13.5	8.0
August.....1,000..	120.1	62.7	91.9	30.5	13.1	7.6
November.....1,000..	117.4	62.4	89.2	29.8	12.9	7.2
Hours.....millions..	227.0	130.8	194.3	57.8	20.9	15.0
Wages.....mil dol..	4 536.5	2 219.6	3 193.6	1 284.8	496.1	271.4
Cost of materials ¹mil dol..	36 133.3	9 019.2	6 108.4	6 788.9	2 181.3	643.8
Materials, parts, containers, etc., consumed ²mil dol..	34 477.0	7 712.7	4 988.8	5 240.9	2 020.6	536.8
Resales.....mil dol..	1 007.4	570.1	64.9	918.8	5.1	.9
Fuels.....mil dol..	56.1	43.3	43.7	14.1	11.8	7.2
Purchased electricity.....mil dol..	243.8	161.8	195.5	118.8	43.9	19.8
Contract work.....mil dol..	349.0	531.3	815.5	496.3	99.9	79.1
Quantity of electric energy used for heat and power:						
Purchased.....mil kWh..	4 456.0	2 653.1	3 557.9	1 836.8	761.3	283.8
Generated less sold.....mil kWh..	(D)	(D)	(D)	—	—	(D)
Total value of shipments.....mil dol..	62 980.8	21 968.5	19 834.6	19 675.1	5 328.1	2 070.7
Value added.....mil dol..	25 157.1	11 445.4	12 636.6	11 080.9	2 819.0	1 456.4
Inventories by stage of fabrication:						
Beginning of 1992.....mil dol..	34 665.7	6 129.2	6 885.3	4 969.4	1 563.2	302.2
Finished goods.....mil dol..	1 719.5	1 842.5	741.3	(D)	(D)	(D)
Work in process.....mil dol..	28 241.3	2 937.9	5 134.4	4 406.2	1 305.8	275.0
Materials and supplies.....mil dol..	4 704.9	1 348.8	1 009.6	(D)	(D)	(D)
End of 1992.....mil dol..	31 826.9	4 308.9	5 626.8	2 872.2	1 259.0	331.5
Finished goods.....mil dol..	1 564.8	1 399.9	648.0	(D)	(D)	(D)
Work in process.....mil dol..	26 705.5	1 876.7	4 138.0	2 596.3	946.6	308.6
Materials and supplies.....mil dol..	3 556.6	1 032.3	840.7	(D)	(D)	(D)

Note: For qualifications of data, see footnotes on table 1a.

¹Data on purchased services for the repair of buildings and machinery and for communication services are not included in cost of materials, etc., but are shown in table 3c.

²Data on materials consumed by type are shown in table 7. Data on amount purchased or transferred from foreign sources are shown in table 3c.

Table 3b. Gross Book Value of Depreciable Assets, Capital Expenditures, Retirements, Depreciation, and Rental Payments: 1992

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Aircraft engines and engine parts (SIC 3724)		Aircraft parts and equipment, n.e.c. (SIC 3728)		Guided missiles and space vehicles (SIC 3761)		Space propulsion units and parts (SIC 3764)		Space vehicle equipment, n.e.c. (SIC 3769)	
	Aircraft (SIC 3721)									
Gross book value of depreciable assets:										
Total:										
Beginning of year	14 710.2	8 397.0	8 881.4	5 671.6	2 564.1	901.7				
New capital expenditures ¹	1 661.3	590.2	1 132.1	306.7	128.2	41.0				
Used capital expenditures	33.6	98.3	47.4	33.0	4.0	.9				
Retirements	899.3	216.7	428.6	333.4	108.6	71.4				
End of year	15 505.7	8 868.7	9 632.3	5 677.9	2 587.8	872.1				
Buildings and other structures:										
Beginning of year	5 669.6	1 764.8	2 666.2	1 837.6	729.1	208.2				
New capital expenditures	(D)	97.5	335.8	61.6	35.8	12.3				
Used capital expenditures	(D)	31.2	9.9	(D)	1.1	.3				
Retirements	(D)	22.2	91.7	(D)	29.3	14.1				
End of year	6 289.2	1 871.3	2 920.2	1 780.8	736.6	206.7				
Machinery and equipment:										
Beginning of year	9 040.6	6 632.2	6 215.2	3 834.0	1 835.1	693.4				
New capital expenditures ¹	(D)	492.7	796.4	245.1	92.4	28.7				
Used capital expenditures	(D)	67.1	37.5	(D)	2.9	.6				
Retirements	(D)	194.5	337.0	(D)	79.3	57.3				
End of year	9 216.5	6 997.5	6 712.1	3 897.1	1 851.1	665.4				
Depreciation charges during 1992:										
Total	1 627.5	524.0	823.0	983.9	191.1	85.0				
Buildings and other structures	404.5	76.8	162.0	252.7	36.3	15.4				
Machinery and equipment	1 223.0	447.2	661.0	731.2	154.9	69.6				
Rental payments:										
Total	218.8	169.8	184.4	224.6	37.6	26.0				
Buildings and other structures	144.6	65.7	99.5	175.6	26.2	19.0				
Machinery and equipment	74.2	104.1	85.0	49.0	11.4	6.9				

¹Data on new machinery and equipment expenditures by type are provided in table 3c.

Table 3c. Supplemental Industry Statistics Based on Sample Estimates: 1992

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Aircraft (SIC 3721)		Aircraft engines and engine parts (SIC 3724)		Aircraft parts and equipment, n.e.c. (SIC 3728)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Purchased services:						
Cost of purchased services for the repair of--						
Buildings and other structures	130.5	(X)	191.8	(X)	52.8	(X)
Response coverage ratio (percent) ²	91.9	(X)	73.7	(X)	90.6	(X)
Machinery	121.3	(X)	629.4	(X)	95.0	(X)
Response coverage ratio (percent) ²	96.9	(X)	74.4	(X)	91.8	(X)
Other purchased services:						
Communications	55.7	(X)	43.4	(X)	39.3	(X)
Response coverage ratio (percent) ²	94.4	(X)	74.0	(X)	80.8	(X)
Legal	77.1	(X)	26.8	(X)	22.3	(X)
Response coverage ratio (percent) ²	96.8	(X)	73.9	(X)	92.2	(X)
Accounting and bookkeeping	35.6	(X)	5.8	(X)	9.3	(X)
Response coverage ratio (percent) ²	96.6	(X)	69.7	(X)	84.8	(X)
Advertising	47.5	(X)	39.6	(X)	7.6	(X)
Response coverage ratio (percent) ²	95.7	(X)	93.1	(X)	88.7	(X)
Software and other data processing	156.9	(X)	382.5	(X)	52.1	(X)
Response coverage ratio (percent) ²	88.0	(X)	72.5	(X)	90.7	(X)
Refuse removal, including hazardous waste	60.4	(X)	50.1	(X)	30.0	(X)
Response coverage ratio (percent) ²	89.6	(X)	73.3	(X)	88.9	(X)
New machinery and equipment expenditures						
Automobiles, trucks, etc., for highway use	(D)	(X)	492.7	(X)	796.4	(X)
Computers and peripheral data processing equipment	(D)	(X)	1.7	13	3.6	15
All other	(D)	(X)	55.8	7	53.9	4
Adjustment ratio ³	(D)	(X)	435.3	1	738.9	1
Adjustment ratio ³	(D)	(X)	1.1	(X)	1.1	(X)
Cost of materials, components, parts, etc., used						
Materials purchased or transferred from foreign sources ⁴	34 477.0	(X)	7 712.7	(X)	4 988.8	(X)
Materials purchased or transferred from domestic sources	3 791.1	1	827.2	4	397.5	3
Adjustment ratio ³	30 685.9	1	6 885.4	1	4 591.3	1
Adjustment ratio ³	1.3	(X)	1.2	(X)	1.5	(X)

See footnotes at end of table.

Table 3c. Supplemental Industry Statistics Based on Sample Estimates: 1992—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Guided missiles and space vehicles (SIC 3761)		Space propulsion units and parts (SIC 3764)		Space vehicle equipment, n.e.c. (SIC 3769)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Purchased services:						
Cost of purchased services for the repair of—						
Buildings and other structures	51.6	(X)	11.9	(X)	1.1	(X)
Response coverage ratio (percent) ²	98.4	(X)	97.9	(X)	63.5	(X)
Machinery	38.5	(X)	15.2	(X)	2.6	(X)
Response coverage ratio (percent) ²	93.0	(X)	97.9	(X)	63.5	(X)
Other purchased services:						
Communications	41.5	(X)	16.0	(X)	3.9	(X)
Response coverage ratio (percent) ²	95.2	(X)	97.5	(X)	63.5	(X)
Legal	25.0	(X)	6.0	(X)	1.4	(X)
Response coverage ratio (percent) ²	91.9	(X)	97.9	(X)	63.5	(X)
Accounting and bookkeeping	2.7	(X)	1.2	(X)	.7	(X)
Response coverage ratio (percent) ²	86.5	(X)	96.6	(X)	63.5	(X)
Advertising	4.2	(X)	.8	(X)	.7	(X)
Response coverage ratio (percent) ²	91.9	(X)	97.9	(X)	63.5	(X)
Software and other data processing	180.5	(X)	15.9	(X)	7.7	(X)
Response coverage ratio (percent) ²	100.0	(X)	91.5	(X)	63.5	(X)
Refuse removal, including hazardous waste	6.5	(X)	5.3	(X)	.8	(X)
Response coverage ratio (percent) ²	98.4	(X)	90.0	(X)	63.5	(X)
New machinery and equipment expenditures	245.1	(X)	92.4	(X)	28.7	(X)
Automobiles, trucks, etc., for highway use	24.4	1	16.2	1	.1	1
Computers and peripheral data processing equipment	56.8	1	17.4	1	5.2	4
All other	163.9	1	58.9	1	23.4	1
Adjustment ratio ³	1.7	(X)	1.1	(X)	1.6	(X)
Cost of materials, components, parts, etc., used	5 240.9	(X)	2 020.6	(X)	536.8	(X)
Materials purchased or transferred from foreign sources ⁴	46.8	(S)	(S)	(S)	(S)	(X)
Materials purchased or transferred from domestic sources	5 194.1	1	(S)	(X)	(S)	(X)
Adjustment ratio ³	1.6	(X)	(S)	(X)	(S)	(X)

Note: The amounts shown for purchased services reflect only those services that establishments purchase from other companies. Amounts purchased by separate central administrative offices and services provided to establishments by central administrative offices are excluded.

¹For description of relative standard error of estimate, see Qualifications of the Data in appendixes.

²A response coverage ratio is derived for this item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight, see appendix B) for those ASM establishments that reported to the weighted total employment for all ASM establishments classified in the industry.

³Detail has been adjusted upwards to account for nonresponse. Inverse of the ratio shown represents a measure of the response of the inquiry. (See appendixes for further explanation.)

⁴Data may understate the true cost of imported parts, components, and supplies since some respondents do not know the origin of these materials. Includes cases where materials were purchased from secondary suppliers or where they were transferred from company-operated warehouses or other distribution points. Direct purchases from foreign suppliers and importers by domestic manufacturing establishments are believed to be reported accurately.

Table 4. Industry Statistics by Employment Size of Establishment: 1992

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3721, AIRCRAFT												
Total	-	182	264.9	11 498.9	122.1	227.0	4 536.5	25 157.1	36 133.3	62 980.8	1 661.3	31 826.9
Establishments with an average of—												
1 to 4 employees	E5	42	.1	2.1	(Z)	.1	1.0	4.0	4.7	8.2	.3	397.3
5 to 9 employees	E5	18	.1	3.0	.1	.1	1.5	5.2	7.2	12.3	.2	5.9
10 to 19 employees	E2	19	.3	9.0	.1	.3	3.5	28.8	19.1	42.5	.4	16.8
20 to 49 employees	E3	23	.7	20.4	.4	.9	10.5	38.5	39.7	70.1	1.2	35.7
50 to 99 employees	E3	17	1.3	37.1	.7	1.4	18.3	65.9	62.3	129.1	2.9	54.4
100 to 249 employees	-	12	1.7	54.0	1.2	2.0	28.5	104.3	95.3	205.4	2.8	84.2
250 to 499 employees	-	9	3.3	107.5	2.1	4.0	54.8	149.6	131.7	310.1	10.3	134.0
500 to 999 employees	-	12	7.6	284.9	5.0	9.2	148.6	577.4	533.3	1 214.3	16.6	453.7
1,000 to 2,499 employees	-	11	17.3	697.7	10.6	21.7	373.1	676.8	1 211.0	2 545.2	83.9	1 184.6
2,500 employees or more	-	19	232.5	10 283.3	101.8	187.3	3 896.7	23 506.5	34 029.0	58 443.7	1 542.5	29 460.3
INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS												
Total	-	442	116.7	4 851.7	64.2	130.8	2 219.6	11 445.4	9 019.2	21 968.5	590.2	4 308.9
Establishments with an average of—												
1 to 4 employees	E6	65	.1	3.5	.1	.2	1.7	8.8	11.0	20.2	.7	5.5
5 to 9 employees	E8	47	.3	8.6	.2	.4	4.2	20.3	16.5	36.8	1.2	11.1
10 to 19 employees	E4	49	.7	21.2	.4	.9	11.5	42.2	30.5	73.7	2.7	20.0
20 to 49 employees	E2	81	2.7	86.3	1.7	3.7	47.6	186.8	146.4	340.6	7.7	77.3
50 to 99 employees	E1	59	4.3	139.0	2.9	5.9	81.7	270.3	197.5	481.3	11.1	130.4
100 to 249 employees	-	70	11.3	390.0	7.7	16.0	228.6	914.6	523.7	1 459.5	33.9	397.0
250 to 499 employees	-	31	11.0	379.7	7.8	16.2	242.5	640.2	627.5	1 295.9	43.1	374.0
500 to 999 employees	-	21	14.2	533.3	8.7	16.2	290.8	982.8	1 041.7	2 133.2	58.0	576.4
1,000 to 2,499 employees	-	11	72.0	3 289.3	34.8	71.4	1 310.9	8 379.5	6 424.3	16 127.3	431.8	2 717.3
2,500 employees or more	-	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	98	.4	9.8	.2	.5	4.7	21.4	17.8	39.2	1.3	11.4

See footnotes at end of table.

Table 4. Industry Statistics by Employment Size of Establishment: 1992—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.												
Total	-	1 121	165.3	6 162.1	93.6	194.3	3 193.6	12 636.6	6 108.4	19 834.6	1 132.1	5 626.8
Establishments with an average of—												
1 to 4 employees	E7	308	.5	14.1	.3	.6	6.8	27.5	23.1	52.5	2.0	18.6
5 to 9 employees	E7	172	1.1	30.6	.6	1.3	14.7	57.5	36.2	93.9	3.5	33.6
10 to 19 employees	E3	180	2.5	69.0	1.5	3.0	35.1	127.9	80.4	210.4	6.5	68.8
20 to 49 employees	E1	191	5.9	177.3	3.7	7.9	93.3	324.4	200.0	525.7	13.2	151.1
50 to 99 employees	E2	95	6.6	201.1	4.4	9.1	111.0	371.1	266.0	661.5	405.4	192.0
100 to 249 employees	-	87	13.9	473.6	8.9	19.0	258.6	1 213.9	496.3	1 754.8	(D)	460.0
250 to 499 employees	-	48	16.5	569.8	10.4	20.6	299.8	1 192.7	833.8	2 026.8	57.7	708.3
500 to 999 employees	-	19	12.5	471.6	7.8	16.0	250.8	1 332.6	604.8	1 989.7	43.6	657.0
1,000 to 2,499 employees	-	11	19.2	755.5	12.3	26.4	474.8	1 394.9	750.2	2 184.7	126.8	716.6
2,500 employees or more	-	10	86.5	3 399.5	43.7	90.5	1 648.8	6 594.0	2 817.7	10 334.5	473.5	2 620.8
Covered by administrative records ²	E9	502	2.5	56.8	1.4	2.7	27.2	97.0	63.6	160.7	6.7	62.2
INDUSTRY 3761, GUIDED MISSILES AND SPACE VEHICLES												
Total	-	38	100.1	4 722.2	31.5	57.8	1 284.8	11 080.9	6 788.9	19 675.1	306.7	2 872.2
Establishments with an average of—												
1 to 4 employees	E5	4	(Z)	.2	(Z)	(Z)	.1	.7	.3	1.0	.5	.2
5 to 9 employees	E8	3	(Z)	1.7	(Z)	(Z)	.5	4.0	2.2	6.2	(D)	1.2
20 to 49 employees	-	2		3.9			1.7	7.2	3.9	11.4	(D)	2.1
50 to 99 employees	E9	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
100 to 249 employees	E4	4	1.6	46.6	.9	1.8	16.7	11.0	172.5	226.8	.5	52.1
250 to 499 employees	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
1,000 to 2,499 employees	-	10	15.7	615.5	5.8	10.4	190.5	99.9	1 223.7	2 741.3	17.7	710.2
2,500 employees or more	-	12	82.7	4 054.3	24.8	45.4	1 075.3	10 958.1	5 386.3	16 688.4	287.9	2 106.3
INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS												
Total	-	42	32.3	1 495.6	13.4	20.9	496.1	2 819.0	2 181.3	5 328.1	128.2	1 259.0
Establishments with an average of—												
1 to 4 employees	E2	3	4	17.5	.3	.6	9.5	90.7	96.6	187.1	8.1	10.6
5 to 9 employees	-	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
10 to 19 employees	-	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
20 to 49 employees	-	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
50 to 99 employees	-	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
100 to 249 employees	E3	5	.8	36.9	.5	1.1	19.9	120.5	64.3	135.5	1.3	188.2
250 to 499 employees	-	6	2.3	91.8	1.4	2.8	54.0	181.0	132.7	316.6	7.2	78.7
500 to 999 employees	-	6	4.1	175.2	2.2	4.1	74.8	326.9	179.7	501.3	25.1	39.7
1,000 to 2,499 employees	-	3	4.3	222.1	1.0	2.1	41.0	414.6	290.3	725.3	(D)	82.4
2,500 employees or more	-	5	20.2	952.0	8.0	10.3	297.0	1 685.2	1 417.7	3 462.3	86.5	859.3
INDUSTRY 3769, SPACE VEHICLE EQUIPMENT, N.E.C.												
Total	-	60	17.2	694.5	7.7	15.0	271.4	1 456.4	643.8	2 070.7	41.0	331.5
Establishments with an average of—												
1 to 4 employees	E8	9	(Z)	.3	(Z)	(Z)	.2	.7	.3	1.0	(Z)	.1
5 to 9 employees	E9	7	.1	1.3	(Z)	.1	.6	2.4	1.1	3.5	.1	.5
10 to 19 employees	E5	7	.1	3.1	.1	.1	1.4	6.0	2.3	8.3	.1	1.0
20 to 49 employees	E1	7	.2	6.0	.1	.2	2.6	11.0	5.6	17.4	.2	2.5
50 to 99 employees	E2	5	.4	15.0	.2	.4	7.1	28.2	13.1	41.6	.2	12.6
100 to 249 employees	-	13	2.0	69.5	1.1	2.4	29.4	136.6	61.2	197.4	4.3	34.0
250 to 499 employees	-	5	2.0	54.3	1.0	1.9	26.3	119.2	40.6	168.6	10.7	26.6
500 to 999 employees	-	3	2.3	115.1	.5	1.0	20.2	226.9	164.7	413.2	(D)	64.1
1,000 to 2,499 employees	-	2	10.3	430.0	4.7	8.9	183.7	925.5	355.0	1 219.8	25.5	190.2
2,500 employees or more	-	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	17	.1	2.2	(Z)	.1	1.0	4.0	1.9	5.9	.1	.8

Note: For qualifications of data, see footnotes on table 1a. Data shown as (D) are included in underscored figures above.

¹Payroll and sales data for some small single-establishment manufacturing companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those employment-size classes where estimated data based on administrative-record data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Report forms were not mailed to small single-establishment companies with up to 20 employees (cutoff varied by industry). Payroll and sales data for 1992 were obtained from administrative records supplied by other agencies of the Federal Government. Those data were then used in conjunction with industry averages to estimate the items shown. Data are also included in respective employment-size classes shown.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1992

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry or product class code	Industry or primary product class	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
3721	Aircraft: All establishments in industry -----	182	264.9	11 498.9	122.1	227.0	4 536.5	25 157.1	36 133.3	62 980.8	1 661.3
	Establishments with this product class primary:										
37211	Military aircraft -----	21	122.4	5 531.1	46.8	91.5	1 829.7	12 919.3	8 766.3	21 808.8	303.5
37215	Civilian aircraft -----	36	95.8	4 053.3	48.7	87.4	1 763.0	8 273.7	24 600.8	34 392.2	1 126.4
37217	Modification, conversion, and overhaul of previously accepted aircraft -----	36	20.7	777.5	13.7	26.8	475.2	1 226.3	1 181.2	2 567.7	93.2
37218	Other aeronautical services on complete aircraft, n.e.c. -----	11	23.9	1 073.5	11.8	19.0	437.5	2 614.4	1 424.6	3 927.8	133.2
3724	Aircraft engines and engine parts: All establishments in industry -----	442	116.7	4 851.7	64.2	130.8	2 219.6	11 445.4	9 019.2	21 968.5	590.2
	Establishments with this product class primary:										
37241	Aircraft engines for military aircraft -----	11	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37242	Aircraft engines for civilian aircraft -----	29	47.1	2 151.4	22.9	47.4	855.2	5 435.7	4 426.3	10 872.4	(D)
37243	Aeronautical services on aircraft engines -----	22	4.9	171.1	2.8	5.3	82.5	260.4	277.7	540.8	22.1
37244	Aircraft engine parts and accessories -----	189	45.7	1 793.6	28.1	57.7	932.4	4 105.8	2 948.7	7 299.7	153.0
3728	Aircraft parts and equipment, n.e.c.: All establishments in industry -----	1 121	165.3	6 162.1	93.6	194.3	3 193.6	12 636.6	6 108.4	19 834.6	1 132.1
	Establishments with this product class primary:										
37282	Aircraft propellers and helicopter rotors -----	20	2.9	109.2	1.7	3.6	55.1	205.0	91.3	300.9	14.3
37283	Research and development on aircraft parts (except engines) -----	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37284	Aircraft hydraulic and pneumatic subassemblies -----	17	8.9	368.5	4.4	9.5	171.0	940.8	384.8	1 385.6	49.8
37285	Aircraft parts and auxiliary equipment, excluding hydraulic and pneumatic subassemblies and engines -----	332	141.4	5 332.4	79.9	166.0	2 787.9	10 882.0	5 242.6	17 140.5	1 017.3
3761	Guided missiles and space vehicles: All establishments in industry -----	38	100.1	4 722.2	31.5	57.8	1 284.8	11 080.9	6 788.9	19 675.1	306.7
	Establishments with this product class primary:										
37611	Complete missiles -----	15	24.9	967.6	11.1	21.1	364.5	1 642.7	2 208.0	5 428.5	28.8
37612	Complete space vehicles (excluding propulsion systems) -----	6	62.9	3 150.7	16.1	27.5	750.8	8 427.3	4 048.0	12 679.3	249.7
37613	Research and development on complete missiles -----	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37614	Research and development on complete space vehicles -----	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37616	Other services on complete guided missiles -----	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37617	All other services on complete space vehicles -----	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	-
3764	Space propulsion units and parts: All establishments in industry -----	42	32.3	1 495.6	13.4	20.9	496.1	2 819.0	2 181.3	5 328.1	128.2
	Establishments with this product class primary:										
37645	Complete missile or space vehicle engines and/ or propulsion units -----	15	24.3	1 130.0	9.1	13.7	333.0	2 250.6	1 214.5	3 564.5	104.2
37646	Research and development on complete missile or space vehicle engines and/ or propulsion units -----	1	(D)	(D)	-	-	-	(D)	(D)	(D)	(D)
37647	Other services on complete missile or space vehicle engines and/ or propulsion units -----	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
37648	Missile and space vehicle engine and/ or propulsion parts and accessories -----	14	3.1	126.7	1.8	3.6	68.1	204.2	155.4	375.2	10.9
3769	Space vehicle equipment, n.e.c.: All establishments in industry -----	60	17.2	694.5	7.7	15.0	271.4	1 456.4	643.8	2 070.7	41.0
	Establishments with this product class primary:										
37692	Missile and space vehicle components, parts, and subassemblies -----	32	16.6	673.5	7.3	14.2	261.4	1 414.1	632.4	2 017.5	39.8
37694	Research and development on missile and space vehicle parts and components, n.e.c. -----	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	-

Note: For qualifications of data, see footnotes on table 1a.

Table 5b. Industry-Product Analysis-Value of Industry and Primary Product Shipments; Specialization and Coverage Ratios: 1992 and Earlier Census Years

[Million dollars. An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work (total miscellaneous receipts). Subtotals for total value of shipments show this product pattern for an industry. Primary products specialization ratio is the primary products value of shipments divided by the sum of primary products value of shipments plus secondary products value of shipments. The extent of which an industry's primary products are shipped by establishments classified both in and out of an industry is the coverage ratio and is calculated by dividing the primary products value of shipments by the value of primary products shipments made in all industries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	1992	1987	1982
INDUSTRY 3721, AIRCRAFT			
Total value of shipments	62 980.8	39 092.7	28 024.3
Primary products value of shipments	54 877.0	34 204.2	23 609.8
Secondary products value of shipments	6 960.6	3 720.1	3 611.2
Total miscellaneous receipts	1 143.2	1 168.4	803.3
Value of resales	968.2	1 028.7	643.7
Contract receipts	30.5	(D)	(D)
Other miscellaneous receipts	144.6	(D)	(D)
Primary products specialization ratio	89	90	87
Value of primary products shipments made in all industries	56 596.6	36 002.8	24 235.1
Value of primary products shipments made in this industry	54 877.0	34 204.2	23 609.8
Value of primary products shipments made in other industries	1 719.6	1 798.6	625.3
Coverage ratio	97	95	97
INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS			
Total value of shipments	21 968.5	20 262.1	13 809.3
Primary products value of shipments	19 487.3	17 735.7	11 183.4
Secondary products value of shipments	1 239.7	1 483.3	2 009.6
Total miscellaneous receipts	1 241.5	1 043.1	616.3
Value of resales	1 030.1	563.0	428.5
Contract receipts	58.5	42.9	(D)
Other miscellaneous receipts	152.8	437.2	(D)
Primary products specialization ratio	94	92	85
Value of primary products shipments made in all industries	20 579.6	18 821.9	11 640.8
Value of primary products shipments made in this industry	19 487.3	17 735.7	11 183.4
Value of primary products shipments made in other industries	1 092.4	1 086.2	457.5
Coverage ratio	95	94	96
INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.			
Total value of shipments	19 834.6	17 949.3	10 193.1
Primary products value of shipments	16 451.3	13 941.3	7 023.7
Secondary products value of shipments	2 877.5	3 049.0	2 895.5
Total miscellaneous receipts	505.8	959.0	273.9
Value of resales	79.7	(D)	62.9
Contract receipts	88.3	(D)	(D)
Other miscellaneous receipts	337.8	232.0	(D)
Primary products specialization ratio	85	82	71
Value of primary products shipments made in all industries	22 132.7	19 528.9	10 789.1
Value of primary products shipments made in this industry	16 451.3	13 941.3	7 023.7
Value of primary products shipments made in other industries	5 681.3	5 587.6	3 765.4
Coverage ratio	74	71	65
INDUSTRY 3761, GUIDED MISSILES AND SPACE VEHICLES			
Total value of shipments	19 675.1	21 565.8	10 218.6
Primary products value of shipments	13 405.0	14 967.9	7 415.8
Secondary products value of shipments	(D)	4 995.7	1 481.7
Total miscellaneous receipts	(D)	1 602.2	1 321.1
Value of resales	(D)	(D)	(D)
Contract receipts	(D)	(D)	(D)
Other miscellaneous receipts	(D)	(D)	(D)
Primary products specialization ratio	(D)	75	83
Value of primary products shipments made in all industries	13 829.5	16 012.3	8 585.6
Value of primary products shipments made in this industry	13 405.0	14 967.9	7 415.8
Value of primary products shipments made in other industries	424.6	1 044.5	1 169.8
Coverage ratio	97	93	86
INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS			
Total value of shipments	5 328.1	3 537.1	2 221.2
Primary products value of shipments	4 681.9	2 849.2	1 957.8
Secondary products value of shipments	433.3	590.3	241.3
Total miscellaneous receipts	212.9	97.6	22.1
Value of resales	(D)	(D)	(D)
Contract receipts	(D)	(D)	(D)
Other miscellaneous receipts	(D)	(D)	(D)
Primary products specialization ratio	92	83	89
Value of primary products shipments made in all industries	5 413.3	3 464.9	2 199.1
Value of primary products shipments made in this industry	4 681.9	2 849.2	1 957.8
Value of primary products shipments made in other industries	731.3	615.7	241.3
Coverage ratio	86	82	89

MANUFACTURES-INDUSTRY SERIES

AEROSPACE EQUIPMENT, INCLUDING PARTS 37B-19

Table 5b. Industry-Product Analysis-Value of Industry and Primary Product Shipments; Specialization and Coverage Ratios: 1992 and Earlier Census Years-Con.

[Million dollars. An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work (total miscellaneous receipts). Subtotals for total value of shipments show this product pattern for an industry. Primary products specialization ratio is the primary products value of shipments divided by the sum of primary products value of shipments plus secondary products value of shipments. The extent of which an industry's primary products are shipped by establishments classified both in and out of an industry is the coverage ratio and is calculated by dividing the primary products value of shipments by the value of primary products shipments made in all industries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	1992	1987	1982
INDUSTRY 3769, SPACE VEHICLE EQUIPMENT, N.E.C.			
Total value of shipments	2 070.7	1 182.2	1 958.3
Primary products value of shipments	1 788.0	(D)	1 193.5
Secondary products value of shipments	261.3	(D)	736.9
Total miscellaneous receipts	21.4	(D)	27.9
Value of resales	(D)	(D)	(D)
Contract receipts	(D)	(D)	(D)
Other miscellaneous receipts	(D)	(D)	(D)
Primary products specialization ratio	87	81	62
Value of primary products shipments made in all industries	4 514.6	3 354.4	2 573.9
Value of primary products shipments made in this industry	1 788.0	(D)	1 193.5
Value of primary products shipments made in other industries	2 726.6	(D)	1 380.4
Coverage ratio	40	(D)	46

Note: For qualifications of data, see footnotes on table 1a.

Table 6a. Product and Product Classes-Value of Shipments by All Producers: 1992 and 1987

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For meaning of abbreviations and symbols, see introductory text]

Product code	Product	1992		1987	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
3721- —	AIRCRAFT				
	Total	(NA)	56 596.6	(NA)	36 002.8
37211	Military aircraft	(NA)	16 483.6	(NA)	16 862.3
37211 00	Military aircraft (including all aircraft for U.S. military and any other aircraft built to military specifications)	27	16 483.6	15	16 862.3
37215	Civilian aircraft	(NA)	31 610.1	(NA)	12 533.7
37215 00	Civilian aircraft ²	35	31 610.1	27	12 533.7
37217	Modification, conversion, and overhaul of previously accepted aircraft ³	(NA)	3 727.1	(NA)	3 473.1
37217 11	For U.S. military aircraft and all other aircraft built to military specifications	21	2 521.5	18	2 602.4
37217 51	For civilian customers	33	1 201.6	21	869.4
37217 00	Modification, conversion, and overhaul of previously accepted aircraft, n.s.k.	(NA)	4.1	(NA)	1.3
37218	Other aeronautical services on complete aircraft, n.e.c. ³	(NA)	4 443.0	(NA)	2 731.8
	For military customers:				
37218 13	Research and development on complete aircraft	5	1 564.0	12	1 441.0
37218 15	All other aeronautical services on complete aircraft	15	2 225.5	11	984.1
	For civilian customers:				
37218 53	Research and development on complete aircraft	3	(⁴)	3	1.0
37218 55	All other aeronautical services on complete aircraft	14	4650.8	10	305.0
37218 00	Other aeronautical services on complete aircraft, n.e.c., n.s.k.	(NA)	2.7	(NA)	.8
37210	Aircraft, n.s.k.	(NA)	332.8	(NA)	401.8
37210 00	Aircraft, n.s.k.	(NA)	332.8	(NA)	401.8
37210 02	Aircraft, n.s.k. ⁵	(NA)	-	(NA)	-
3724- —	AIRCRAFT ENGINES AND ENGINE PARTS				
	Total	(NA)	20 579.6	(NA)	18 821.9
37241	Aircraft engines for military aircraft	(NA)	3 154.8	(NA)	4 205.6
37241 00	Military engines (for U.S. military aircraft and any other aircraft built to military specifications)	27	3 154.8	30	4 205.6
37242	Aircraft engines for civilian aircraft	(NA)	6 689.4	(NA)	2 806.3
37242 00	Aircraft engines for civilian aircraft ²	36	6 689.4	13	2 806.3
37243	Aeronautical services on aircraft engines ³	(NA)	2 627.6	(NA)	1 951.0
	Research and development work on aircraft engines:				
37243 21	For U.S. military aircraft engines and all other engines built to military specifications	14	(⁶)	16	1 008.8
37243 23	For civilian aircraft engines	16	⁶ 1 180.0	10	58.5
	All other aeronautical services on aircraft engines:				
37243 31	For U.S. military aircraft engines and all other engines built to military specifications	14	710.3	13	372.8
37243 33	For civilian aircraft engines	18	737.3	18	503.0
37243 00	Aeronautical services on aircraft engines, n.s.k.	(NA)	-	(NA)	7.9

See footnotes at end of table.

37B-20 AEROSPACE EQUIPMENT, INCLUDING PARTS

MANUFACTURES-INDUSTRY SERIES

Table 6a. Product and Product Classes—Value of Shipments by All Producers: 1992 and 1987—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For meaning of abbreviations and symbols, see introductory text]

Product code	Product	1992		1987	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
3724—	AIRCRAFT ENGINES AND ENGINE PARTS—Con.				
37244	Aircraft engine parts and accessories -----	(NA)	7 725.6	(NA)	9 504.2
	Military:				
37244 01	For spark ignition reciprocating or rotary internal combustion engines -----	55	1 558.0	62	1 414.3
37244 02	For other engines -----	69	1 492.8	96	2 826.1
	Civilian:				
37244 05	For spark ignition reciprocating or rotary internal combustion engines -----	79	1 927.2	70	1 550.3
37244 06	For other engines -----	78	2 604.1	107	3 519.5
37244 00	Aircraft engine parts and accessories, n.s.k. -----	(NA)	143.6	(NA)	194.0
37240	Aircraft engines and engine parts, n.s.k. -----	(NA)	382.1	(NA)	354.9
37240 00	Aircraft engines and engine parts, n.s.k. ⁷ -----	(NA)	343.0	(NA)	223.9
37240 02	Aircraft engines and engine parts, n.s.k. ⁸ -----	(NA)	39.2	(NA)	131.0
3728—	AIRCRAFT PARTS AND AUXILIARY EQUIPMENT, N.E.C.				
	Total -----	(NA)	22 132.7	(NA)	¹⁹ 528.9
37282	Aircraft propellers and helicopter rotors -----	(NA)	517.0	(NA)	724.1
37282 10	Complete propellers, excluding helicopter rotors -----	9	86.5	5	69.6
37282 31	Propeller blades -----	9	64.5	(NA)	⁹ 110.6
37282 51	Propeller parts, except propeller blades -----	13	82.1	(NA)	⁽⁹⁾
37282 61	Helicopter rotors and parts -----	30	267.4	22	542.7
37282 00	Aircraft propellers and helicopter rotors, n.s.k. -----	(NA)	16.6	(NA)	1.2
37283	Research and development on aircraft parts (except engines) -----	(NA)	1 311.1	(NA)	2 347.5
37283 13	For U.S. military aircraft and all other aircraft built to military specifications -----	23	⁽¹⁰⁾	20	2 243.0
37283 15	For civilian aircraft -----	11	¹⁰ 310.6	14	104.0
37283 00	Research and development on aircraft parts (except engines), n.s.k. -----	(NA)	.5	(NA)	.4
37284	Aircraft hydraulic and pneumatic subassemblies -----	(NA)	1 474.6	(NA)	¹¹ 332.1
	Aircraft hydraulic subassemblies:				
37284 73	For U.S. military aircraft and all other aircraft built to military specifications ¹² -----	14	193.6	24	286.9
37284 75	For civilian aircraft ¹² -----	12	774.5	20	622.4
	Aircraft pneumatic subassemblies:				
37284 83	For U.S. military aircraft and all other aircraft built to military specifications ¹² -----	16	131.0	11	193.6
37284 85	For civilian aircraft ¹² -----	15	373.1	11	229.2
37284 00	Aircraft hydraulic and pneumatic subassemblies, n.s.k. -----	(NA)	2.4	(NA)	⁽¹¹⁾
37285	Aircraft parts and auxiliary equipment, excluding hydraulic and pneumatic subassemblies and engines -----	(NA)	17 911.1	(NA)	¹¹⁴ 485.7
	Aircraft mechanical power transmission equipment:				
37285 13	For U.S. military aircraft and all other aircraft built to military specifications ¹² -----	27	589.2	17	690.0
37285 15	For civilian aircraft ¹² -----	23	749.8	20	356.1
	Aircraft landing gear:				
37285 94	For U.S. military aircraft and all other aircraft built to military specifications ¹² -----	24	872.6	15	482.8
37285 95	For civilian aircraft ¹² -----	31	630.9	21	381.3
	Other aircraft subassemblies and parts:				
37285 98	For U.S. military aircraft and all other aircraft built to military specifications ¹² -----	209	3 936.1	212	6 892.1
37285 99	For civilian aircraft ¹² -----	239	11 080.5	203	5 365.0
37285 00	Aircraft parts and auxiliary equipment, excluding hydraulic and pneumatic subassemblies and engines, n.s.k. -----	(NA)	52.0	(NA)	318.4
37280	Aircraft parts and auxiliary equipment, n.e.c., n.s.k. -----	(NA)	919.0	(NA)	639.6
37280 00	Aircraft parts and auxiliary equipment, n.e.c., n.s.k. ⁷ -----	(NA)	758.3	(NA)	408.8
37280 02	Aircraft parts and auxiliary equipment, n.e.c., n.s.k. ⁸ -----	(NA)	160.7	(NA)	230.8
3761—	GUIDED MISSILES AND SPACE VEHICLES				
	Total -----	(NA)	13 829.5	(NA)	16 012.3
37611	Complete missiles -----	(NA)	3 906.3	(NA)	3 262.4
37611 00	Complete guided missiles -----	10	3 906.3	13	3 262.4
37613	Research and development on complete missiles -----	(NA)	1 351.8	(NA)	3 295.8
37613 00	Research and development on complete guided missiles ³ -----	12	1 351.8	11	3 295.8
37616	Other services on complete guided missiles ¹³ -----	(NA)	1 401.1	(NA)	¹³ 271.4
37616 00	All other services on complete guided missiles ^{3 12} -----	13	1 401.1	10	3 271.4
37612	Complete space vehicles (excluding propulsion systems) -----	(NA)	5 766.1	(NA)	5 172.0
37612 01	For U.S. Government military customers -----	7	4 378.3	8	3 671.7
37612 02	For other customers ¹² -----	6	1 387.7	6	1 499.7
37612 00	Complete space vehicles (excluding propulsion systems), n.s.k. -----	(NA)	—	(NA)	.6
37614	Research and development on complete space vehicles ³ -----	(NA)	588.2	(NA)	974.6
37614 01	For U.S. Government military customers -----	8	219.1	(NA)	¹⁴ 974.6
37614 02	For other customers -----	6	369.1	(NA)	⁽¹⁴⁾
37614 00	Research and development on complete space vehicles, n.s.k. -----	(NA)	—	(NA)	—
37617	All other services on complete space vehicles ³ -----	(NA)	814.8	(NA)	⁽¹³⁾
37617 02	For U.S. Government military customers -----	6	706.2	11	1 429.9
37617 03	For other customers ¹² -----	6	108.6	7	747.5
37617 00	All other services on complete space vehicles, n.s.k. -----	(NA)	—	(NA)	⁽¹³⁾

See footnotes at end of table.

Table 6a. Product and Product Classes—Value of Shipments by All Producers: 1992 and 1987—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For meaning of abbreviations and symbols, see introductory text]

Product code	Product	1992		1987	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
3761—	GUIDED MISSILES AND SPACE VEHICLES—Con.				
37610	Guided missiles and space vehicles, n.s.k.-----	(NA)	1.2	(NA)	36.2
37610 00	Guided missiles and space vehicles, n.s.k.-----	(NA)	1.2	(NA)	36.2
37610 02	Guided missiles and space vehicles, n.s.k. ⁵ -----	(NA)	—	(NA)	—
3764—	SPACE PROPULSION UNITS AND PARTS				
	Total -----	(NA)	5 413.3	(NA)	3 464.9
37645	Complete missile or space vehicle engines and/ or propulsion units ---	(NA)	2 806.7	(NA)	1 846.0
37645 11	For U.S. Government military customers-----	10	1 431.3	13	1 392.6
37645 13	For U.S. Government nonmilitary customers-----	7	1 078.3	6	395.9
37645 15	For other customers-----	10	297.1	7	57.3
37645 00	Complete missile or space vehicle engines and/ or propulsion units, n.s.k.-----	(NA)	—	(NA)	.2
37646	Research and development on complete missile or space vehicle engines and/ or propulsion units ³ -----	(NA)	620.4	(NA)	615.3
37646 11	For U.S. Government military customers-----	12	433.3	12	456.4
37646 13	For U.S. Government nonmilitary customers-----	5	123.1	(NA)	(¹⁵)
37646 15	For other customers-----	8	63.1	(NA)	1 ⁵ 158.7
37646 00	Research and development on complete missile or space vehicle engines and/ or propulsion units, n.s.k.-----	(NA)	1.0	(NA)	.2
37647	Other services on complete missile or space vehicle engines and/ or propulsion units-----	(NA)	1 304.6	(NA)	149.2
37647 11	For U.S. Government military customers-----	8	(D)	8	110.7
37647 13	For U.S. Government nonmilitary customers-----	5	(D)	(NA)	(¹⁶)
37647 15	For other customers-----	4	(D)	(NA)	1 ⁶ 38.4
37647 00	Other services on complete missile or space vehicle engines and/ or propulsion units, n.s.k.-----	(NA)	—	(NA)	—
37648	Missile and space vehicle engine and/ or propulsion parts and accessories-----	(NA)	626.2	(NA)	816.5
37648 11	For U.S. Government military customers-----	28	500.2	29	539.9
37648 13	For U.S. Government nonmilitary customers-----	15	56.6	(NA)	1 ⁷ 274.3
37648 15	For other customers-----	19	65.6	(NA)	(¹⁷)
37648 00	Missile and space vehicle engine and/ or propulsion parts and accessories, n.s.k.-----	(NA)	3.9	(NA)	2.4
37640	Space propulsion units and parts, n.s.k.-----	(NA)	55.3	(NA)	38.0
37640 00	Space propulsion units and parts, n.s.k.-----	(NA)	55.3	(NA)	38.0
37640 02	Space propulsion units and parts, n.s.k. ⁵ -----	(NA)	—	(NA)	—
3769—	SPACE VEHICLE EQUIPMENT, N.E.C.				
	Total -----	(NA)	4 514.6	(NA)	3 354.4
37692	Missile and space vehicle components, parts, and subassemblies ³ -----	(NA)	3 770.4	(NA)	2 329.8
	For U.S. Government military customers:				
37692 11	Airframes-----	9	123.7	20	313.1
37692 13	Space capsules-----	10	158.2	(NA)	1 ⁸ 1 301.3
37692 19	All other-----	54	2 373.0	(NA)	(¹⁸)
37692 25	For U.S. Government nonmilitary customers-----	17	919.2	28	512.5
37692 35	For other customers-----	19	173.3	15	180.7
37692 00	Missile and space vehicle components, parts, and subassemblies, n.s.k.-----	(NA)	23.0	(NA)	22.2
37694	Research and development on missile and space vehicle parts and components, n.e.c. ³ -----	(NA)	705.6	(NA)	990.2
	For U.S. Government military customers:				
37694 14	Airframes and space capsules-----	5	87.8	(NA)	1 ⁹ 711.8
37694 19	All other-----	20	422.6	(NA)	(¹⁹)
37694 25	For U.S. Government nonmilitary customers-----	9	139.2	9	227.8
37694 35	For other customers-----	6	38.5	8	41.9
37694 00	Research and development on missile and space vehicle parts and components, n.e.c., n.s.k.-----	(NA)	17.5	(NA)	8.8
37690	Space vehicle equipment, n.e.c., n.s.k.-----	(NA)	38.6	(NA)	34.4
37690 00	Space vehicle equipment, n.e.c., n.s.k. ⁷ -----	(NA)	32.7	(NA)	26.7
37690 02	Space vehicle equipment, n.e.c., n.s.k. ⁸ -----	(NA)	5.9	(NA)	7.7

¹Data reported by all producers, not just those with shipments of \$100,000 or more.

²Additional detail is collected for this product in the Current Industrial Reports. For the survey number and title, see appendix C, part 3.

³Data for this product represent value of receipts rather than value of shipments.

⁴For 1992, product codes 37218 53 and 37218 55 are combined to avoid disclosing data for individual companies.

⁵There were no administrative-record cases for this industry.

⁶For 1992, product codes 37243 21 and 37243 23 are combined to avoid disclosing data for individual companies.

⁷Typically for establishments with 10 employees or more.

⁸Typically for establishments with less than 10 employees.

⁹For 1987, product code 3728251 was combined with 3728231 to avoid disclosing data for individual companies.

¹⁰For 1992, product codes 37283 13 and 37283 15 are combined to avoid disclosing data for individual companies.

¹¹For 1987, product class 37284 and 37285 did not exist but were broken out from product class 37281; therefore, no historical comparison can be made.

¹²For 1992, product code is revised. See appendix C, parts 1 and 2 for comparability.

¹³For 1987, product class 37616 and 37617 did not exist but were broken out from product class 37615; therefore, no historical comparison can be made.

¹⁴For 1987, product code 3761402 was combined with 3761401 to avoid disclosing data for individual companies.

¹⁵For 1987, product code 3764613 was combined with code 3764615 to avoid disclosing data for individual companies.

¹⁶For 1987, product code 3764713 was combined with code 3764715 to avoid disclosing data for individual companies.

¹⁷For 1987, product code 3764815 was combined with code 3764813 to avoid disclosing data for individual companies.

¹⁸For 1987, product code 3769219 was combined with code 3769213 to avoid disclosing data for individual companies.

¹⁹For 1987, product code 3769419 was combined with code 3769414 to avoid disclosing data for individual companies.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1992 and 1987

[Million dollars. Product classes shown are those where the data are geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by kind" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1992. For meaning of abbreviations and symbols, see introductory text]

Product class and geographic area	1992 value of product shipments	1987 value of product shipments	Product class and geographic area	1992 value of product shipments	1987 value of product shipments
37211, MILITARY AIRCRAFT			37285, AIRCRAFT PARTS AND AUXILIARY EQUIPMENT, EXCLUDING HYDRAULIC AND PNEUMATIC SUBASSEMBLIES AND ENGINES		
United States	16 483.6	16 862.3	United States	17 911.1	(NA)
California	5 694.6	4 604.0	Arizona	164.0	(NA)
37215, CIVILIAN AIRCRAFT			California	3 911.7	(NA)
United States	31 610.1	12 533.7	Colorado	72.1	(NA)
Kansas	1 248.2	(NA)	Florida	193.1	(NA)
Texas	129.5	(NA)	Illinois	236.8	(NA)
37217, MODIFICATION, CONVERSION, AND OVERHAUL OF PREVIOUSLY ACCEPTED AIRCRAFT			Michigan	143.3	(NA)
United States	3 727.1	3 473.1	New Jersey	162.2	(NA)
California	458.7	1 088.0	New York	1 207.5	(NA)
Florida	22.1	60.4	Ohio	840.2	(NA)
Texas	1 218.3	(NA)	Oklahoma	427.3	(NA)
37218, OTHER AERONAUTICAL SERVICES ON COMPLETE AIRCRAFT, N.E.C.			Pennsylvania	215.9	(NA)
United States	4 443.0	2 731.8	Texas	1 686.4	(NA)
California	885.3	172.9	Utah	46.7	(NA)
37241, AIRCRAFT ENGINES FOR MILITARY AIRCRAFT			Wisconsin	4.3	(NA)
United States	3 154.8	4 205.6	37611, COMPLETE MISSILES		
37242, AIRCRAFT ENGINES FOR CIVILIAN AIRCRAFT			United States	3 906.3	3 262.4
United States	6 689.4	2 806.3	37612, COMPLETE SPACE VEHICLES (EXCLUDING PROPULSION SYSTEMS)		
37243, AERONAUTICAL SERVICES ON AIRCRAFT ENGINES			United States	5 766.1	5 172.0
United States	2 627.6	1 951.0	California	4 214.6	4 327.2
California	194.0	190.9	37613, RESEARCH AND DEVELOPMENT ON COMPLETE MISSILES		
Connecticut	127.1	304.5	United States	1 351.8	3 295.8
Illinois	19.7	(NA)	37614, RESEARCH AND DEVELOPMENT ON COMPLETE SPACE VEHICLES		
Texas	38.8	(NA)	United States	588.2	974.6
37244, AIRCRAFT ENGINE PARTS AND ACCESSORIES			California	454.7	565.3
United States	7 725.6	9 504.2	37616, OTHER SERVICES ON COMPLETE GUIDED MISSILES		
California	645.5	773.0	United States	1 401.1	(NA)
Connecticut	582.6	2 699.6	California	955.6	(NA)
Florida	1 085.3	452.9	37617, ALL OTHER SERVICES ON COMPLETE SPACE VEHICLES		
Georgia	95.2	131.5	United States	814.8	(NA)
Illinois	223.5	234.2	37645, COMPLETE MISSILE OR SPACE VEHICLE ENGINES AND/OR PROPULSION UNITS		
Indiana	285.1	763.9	United States	2 806.7	1 846.0
Massachusetts	413.2	422.5	California	1 239.5	907.5
Michigan	227.8	270.8	37646, RESEARCH AND DEVELOPMENT ON COMPLETE MISSILE OR SPACE VEHICLE ENGINES AND/OR PROPULSION UNITS		
New York	328.2	276.3	United States	620.4	615.3
Ohio	1 629.3	1 314.5	California	349.5	163.6
Oklahoma	16.8	(NA)	37647, OTHER SERVICES ON COMPLETE MISSILE OR SPACE VEHICLE ENGINES AND/OR PROPULSION UNITS		
Pennsylvania	189.8	145.4	United States	1 304.6	149.2
Texas	144.5	(NA)	37648, MISSILE AND SPACE VEHICLE ENGINE AND/OR PROPULSION PARTS AND ACCESSORIES		
37282, AIRCRAFT PROPELLERS AND HELICOPTER ROTORS			United States	626.2	816.5
United States	517.0	724.1	Arizona	25.7	(NA)
California	57.7	65.0	California	179.6	480.8
Connecticut	210.3	157.3	Texas	17.5	(NA)
Michigan	6.5	8.6	37283, RESEARCH AND DEVELOPMENT ON AIRCRAFT PARTS (EXCEPT ENGINES)		
Ohio	95.8	50.5	United States	1 311.1	2 347.5
Texas	3.9	(NA)	37284, AIRCRAFT HYDRAULIC AND PNEUMATIC SUBASSEMBLIES		
37283, RESEARCH AND DEVELOPMENT ON AIRCRAFT PARTS (EXCEPT ENGINES)			United States	1 474.6	(NA)
United States	1 311.1	2 347.5	California	208.4	(NA)
37284, AIRCRAFT HYDRAULIC AND PNEUMATIC SUBASSEMBLIES					
United States	1 474.6	(NA)			
California	208.4	(NA)			

See footnotes at end of table.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1992 and 1987—Con.

[Million dollars. Product classes shown are those where the data are geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by kind" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1992. For meaning of abbreviations and symbols, see introductory text]

Product class and geographic area	1992 value of product shipments	1987 value of product shipments	Product class and geographic area	1992 value of product shipments	1987 value of product shipments
37692, MISSILE AND SPACE VEHICLE COMPONENTS, PARTS, AND SUBASSEMBLIES			37694, RESEARCH AND DEVELOPMENT ON MISSILE AND SPACE VEHICLE PARTS AND COMPONENTS, N.E.C.		
United States	3 770.4	2 329.8	United States	705.6	990.2
California	1 170.3	446.9	California	166.4	142.3
Texas	22.8	(NA)			

Note: For qualifications of data, see footnotes on table 6a.

Table 6c. Historical Statistics for Product Classes—Value Shipped by All Producers: 1992 and Earlier Years

[Million dollars. For meaning of abbreviations and symbols, see introductory text]

Product code	Product class	1992	1991 ¹	1990 ¹	1989 ¹	1988 ¹	1987	1982	1977
3721-	Aircraft	56 596.6	52 513.5	46 885.3	39 531.0	37 765.1	36 002.8	24 235.1	12 052.6
37211	Military aircraft	16 483.6	15 622.0	14 108.7	14 832.9	15 044.4	16 862.3	9 834.5	4 579.6
37215	Civilian aircraft	31 610.1	29 201.0	24 605.9	17 257.6	15 856.7	12 533.7	8 769.4	4 706.1
37217	Modification, conversion, and overhaul of previously accepted aircraft	3 727.1	4 277.3	3 712.9	3 829.7	3 692.5	3 473.1	2 783.4	747.2
37218	Other aeronautical services on complete aircraft, n.e.c.	4 443.0	3 346.2	4 370.2	3 452.4	3 070.3	2 731.8	2 817.1	1 988.2
37210	Aircraft, n.s.k.	332.8	67.0	87.6	158.4	101.3	401.8	30.7	31.7
3724-	Aircraft engines and engine parts	20 579.6	21 314.9	21 580.2	19 903.9	18 866.7	18 821.9	11 640.8	4 994.6
37241	Aircraft engines for military aircraft	3 154.8	2 967.6	3 265.8	3 342.0	3 214.2	4 205.6	(D)	1 047.9
37242	Aircraft engines for civilian aircraft	6 689.4	5 986.2	5 365.6	4 376.1	3 983.5	2 806.3	2 142.6	937.0
37243	Aeronautical services on aircraft engines	2 627.6	2 901.4	2 818.9	3 094.8	2 276.4	1 951.0	(D)	660.8
37244	Aircraft engine parts and accessories	7 725.6	9 165.1	9 796.4	8 765.0	9 038.7	9 504.2	5 725.5	2 308.5
37240	Aircraft engines and engine parts, n.s.k.	382.1	294.6	333.5	326.0	353.9	354.9	79.4	40.4
3728-	Aircraft parts and auxiliary equipment, n.e.c.	22 132.7	25 288.2	23 081.8	21 294.5	20 545.4	19 528.9	10 789.1	5 761.5
37282	Aircraft propellers and helicopter rotors	517.0	951.4	881.1	746.5	676.3	724.1	191.0	(NA)
37283	Research and development on aircraft parts (except engines) ..	1 311.1	1 402.5	1 810.8	1 712.4	2 848.1	2 347.5	432.2	161.4
37284	Aircraft hydraulic and pneumatic subassemblies	1 474.6							(NA)
37285	Aircraft parts and auxiliary equipment, excluding hydraulic and pneumatic subassemblies and engines	17 911.1	22 155.1	19 618.1	18 155.9	16 331.0	15 817.8	9 862.4	(NA)
37280	Aircraft parts and auxiliary equipment, n.e.c., n.s.k.	919.0	779.3	771.7	679.7	690.0	639.6	303.5	163.2
3761-	Guided missiles and space vehicles	13 829.5	16 074.9	16 907.0	17 049.1	17 459.3	16 012.3	8 585.6	4 848.2
37611	Complete missiles	3 906.3	3 913.0	3 903.2	3 609.6	3 347.1	3 262.4	2 644.8	1 685.5
37612	Complete space vehicles (excluding propulsion systems)	5 766.1	6 328.7	6 769.7	5 520.0	5 440.3	5 172.0	2 010.7	822.1
37613	Research and development on complete missiles	1 351.8	2 459.6	2 658.3	2 976.7	3 686.9	3 295.8	1 504.0	871.5
37614	Research and development on complete space vehicles	588.2	817.1	1 107.5	1 208.6	1 405.1	974.6	987.2	918.1
37616	Other services on complete guided missiles	1 401.1	2 554.3	2 423.3	3 700.1	3 510.1	3 271.4	1 438.3	549.9
37617	All other services on complete space vehicles	814.8							
37610	Guided missiles and space vehicles, n.s.k.	1.2	2.3	45.1	34.1	69.7	36.2	.5	1.1
3764-	Space propulsion units and parts	5 413.3	4 530.3	4 662.2	4 583.7	3 785.3	3 464.9	2 199.1	930.1
37645	Complete missile or space vehicle engines and/or propulsion units	2 806.7	2 396.4	2 445.9	2 306.5	1 803.6	1 846.0	960.7	370.6
37646	Research and development on complete missile or space vehicle engines and/or propulsion units	620.4	1 017.8	799.3	864.2	704.1	615.3	694.8	345.8
37647	Other services on complete missile or space vehicle engines and/or propulsion units	1 304.6	218.8	282.4	332.7	234.7	149.2	238.0	105.0
37648	Missile and space vehicle engine and/or propulsion parts and accessories	626.2	837.8	1 072.9	1 044.0	1 003.8	816.5	301.5	105.6
37640	Space propulsion units and parts, n.s.k.	55.3	59.5	61.7	36.4	39.1	38.0	4.2	3.1
3769-	Space vehicle equipment, n.e.c.	4 514.6	4 387.0	5 024.3	3 958.0	3 819.9	3 354.4	2 573.9	882.4
37692	Missile and space vehicle components, parts, and subassemblies ..	3 770.4	3 147.9	3 551.5	3 110.3	2 725.2	2 329.8	1 161.0	420.0
37694	Research and development on missile and space vehicle parts and components, n.e.c.	705.6	1 214.9	1 441.8	815.4	1 049.2	990.2	1 403.3	455.2
37690	Space vehicle equipment, n.e.c., n.s.k.	38.6	24.2	31.0	32.4	45.5	34.4	9.6	7.2

¹Figures are estimates derived from a representative sample of manufacturing establishments. Standard errors associated with estimates are published in annual survey of manufactures publications for this period.

Table 7. Materials Consumed by Kind: 1992 and 1987

[Includes cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

Material code	Material	1992 delivered cost (million dollars)	1987 delivered cost (million dollars)
INDUSTRY 3721, AIRCRAFT			
Materials, ingredients, containers, and supplies -----		34 477.0	21 576.2
372400	Aircraft engines -----		3 454.3
372440	Aircraft engine parts (except instruments) -----		62.9
Structural components (airframe), excluding instruments:			
372861	Fuselage -----	15 637.1	(¹)
372862	Empennage (tail) -----		(¹)
372863	Wings -----		(¹)
372864	Landing gear -----		(¹)
372865	Other, including engine mounts -----		(¹)
372851	Aircraft propellers and parts thereof -----	45.0	55.0
253140	Aircraft seats -----	8.7	(¹)
Avionics:			
366303	Radio communication systems and equipment, including airborne transmitters and receivers (microwave, UHF, VHF, etc.) -----	655.8	(¹)
381260	Navigational systems and equipment (NAV AIDS) -----	254.1	(¹)
380090	Search, detection, tracking, and electronic communication systems and equipment (RADAR, SONAR, Optical) -----	3 356.1	(¹)
380091	Flight, navigational, airframe, and engine indicators, instruments and clusters, including sensors, displays, etc. -----		(¹)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic components -----	285.3	169.5
Matrix composites:			
190070	Resin -----	(D)	(¹)
190071	Other, including ceramic, carbon, metal, etc. -----	41.6	(¹)
372870	Complete mechanical, hydraulic, and pneumatic subassemblies -----	163.9	(¹)
Fluid power products, excluding complete subassemblies:			
359412	Fluid power pumps, motors, and hydrostatic transmissions -----	149.6	141.0
349235	Valves -----	147.3	106.2
349261	Hose or tube fittings and assemblies -----	101.4	103.2
359303	Cylinders and rotary actuators -----	154.7	(¹)
356921	Filters -----	158.1	(¹)
190089	Other fluid power products -----		(¹)
356200	Ball and roller bearings (mounted and unmounted) -----	(D)	(¹)
354501	Cutting tools for machine tools -----	(D)	44.7
Fabricated metal products, except forgings:			
342973	Aircraft metal hardware -----	215.7	95.2
345001	Bolts, nuts, screws, washers, rivets, and screw machine products -----	447.6	360.5
340050	Other fabricated metal products, except fluid power -----		(¹)
Forgings:			
346200	Iron and steel -----	(D)	67.6
346310	Aluminum and aluminum-base alloy -----	(D)	169.9
346326	Titanium and titanium-base alloy -----	(D)	48.2
346001	Other forgings -----	(D)	(²)
Castings (rough and semifinished):			
332001	Iron and steel -----	(D)	(¹)
336005	Aluminum and aluminum-base alloy -----	(D)	115.2
336003	Other nonferrous -----	21.2	(²)
Shapes and forms, except castings, forgings, and fabricated metal products:			
Steel:			
331007	Bars, bar shapes, and plates -----	115.1	(¹)
331022	Sheet and strip -----		(¹)
331034	Other steel shapes and forms -----		231.4
Aluminum and aluminum-base alloy:			
335301	Sheet, plate, foil, and welded tubing -----	268.1	197.0
335011	All other (except sheet, plate, foil, and welded tubing) -----	54.4	(¹)
332007	Copper and copper-base alloy shapes and forms -----	(D)	69.9
335601	Titanium and titanium-base alloy -----	(D)	107.8
335042	Other nonferrous shapes and forms -----	(D)	(¹)
285101	Paints, varnishes, lacquers, stains, shellacs, japans, enamels, and allied products -----	32.1	86.1
970099	All other materials and components, parts, containers, and supplies -----	8 859.9	²⁸ 944.8
971000	Materials, ingredients, containers, and supplies, n.s.k. ³ -----	2 310.8	6 945.8
INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS			
Materials, ingredients, containers, and supplies -----		7 712.7	7 686.2
372400	Aircraft engines -----	(D)	42.3
372440	Aircraft engine parts (except instruments) -----	4 350.2	1 169.5
Structural components (airframe), excluding instruments:			
372861	Fuselage -----	(D)	(¹)
372862	Empennage (tail) -----	-	(¹)
372863	Wings -----	-	(¹)
372864	Landing gear -----	(D)	(¹)
372865	Other, including engine mounts -----	8.7	(¹)
372851	Aircraft propellers and parts thereof -----	(D)	(¹)
253140	Aircraft seats -----	-	(¹)
Avionics:			
366303	Radio communication systems and equipment, including airborne transmitters and receivers (microwave, UHF, VHF, etc.) -----	(D)	(¹)
381260	Navigational systems and equipment (NAV AIDS) -----	(D)	(¹)
380090	Search, detection, tracking, and electronic communication systems and equipment (RADAR, SONAR, Optical) -----	(D)	(¹)
380091	Flight, navigational, airframe, and engine indicators, instruments and clusters, including sensors, displays, etc. -----	-	64.0
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic components -----	8.7	26.8
Matrix composites:			
190070	Resin -----	6.5	(¹)
190071	Other, including ceramic, carbon, metal, etc. -----	24.1	(¹)
372870	Complete mechanical, hydraulic, and pneumatic subassemblies -----	7.3	(¹)
Fluid power products, excluding complete subassemblies:			

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1992 and 1987—Con.

[Includes cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

Material code	Material	1992 delivered cost (million dollars)	1987 delivered cost (million dollars)
INDUSTRY 3724, AIRCRAFT ENGINES AND ENGINE PARTS—Con.			
Fluid power products, excluding complete subassemblies—Con.			
359412	Fluid power pumps, motors, and hydrostatic transmissions		(1)
349235	Valves		2.7
349261	Hose or tube fittings and assemblies		7.1
359303	Cylinders and rotary actuators	3.0	7.5
356921	Filters		(1)
190089	Other fluid power products		(1)
356200	Ball and roller bearings (mounted and unmounted)	(D)	(1)
354501	Cutting tools for machine tools	(D)	129.2
Fabricated metal products, except forgings:			
342973	Aircraft metal hardware	104.4	8.0
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	57.6	34.4
340050	Other fabricated metal products, except fluid power	69.7	(1)
Forgings:			
346200	Iron and steel	127.9	292.9
346310	Aluminum and aluminum-base alloy	(4)	(6)
346326	Titanium and titanium-base alloy	137.5	433.8
346001	Other forgings	4340.4	816.8
Castings (rough and semifinished):			
332001	Iron and steel	103.4	196.2
336005	Aluminum and aluminum-base alloy	71.4	60.7
336003	Other nonferrous	202.1	190.4
Shapes and forms, except castings, forgings, and fabricated metal products:			
Steel:			
331007	Bars, bar shapes, and plates	53.7	(1)
331022	Sheet and strip	22.0	(1)
331034	Other steel shapes and forms	18.2	154.5
Aluminum and aluminum-base alloy:			
335301	Sheet, plate, foil, and welded tubing	5.0	7.3
335011	All other (except sheet, plate, foil, and welded tubing)	13.6	18.9
332007	Copper and copper-base alloy shapes and forms	(6)	.3
335601	Titanium and titanium-base alloy	28.9	86.2
335042	Other nonferrous shapes and forms	652.6	(1)
285101	Paints, varnishes, lacquers, stains, shellacs, japans, enamels, and allied products	.9	3.8
970099	All other materials and components, parts, containers, and supplies	586.2	2 930.9
971000	Materials, ingredients, containers, and supplies, n.s.k. ³	855.8	1 002.0
INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.			
Materials, ingredients, containers, and supplies		4 988.8	4 545.9
372400	Aircraft engines		7187.6
372440	Aircraft engine parts (except instruments)	80.0	(7)
Structural components (airframe), excluding instruments:			
372861	Fuselage		(1)
372862	Empennage (tail)		(1)
372863	Wings	511.1	(1)
372864	Landing gear		(1)
372865	Other, including engine mounts		(1)
372851	Aircraft propellers and parts thereof	7.7	(2)
253140	Aircraft seats	(D)	(1)
Avionics:			
366303	Radio communication systems and equipment, including airborne transmitters and receivers (microwave, UHF, VHF, etc.)	24.8	(1)
381260	Navigational systems and equipment (NAV AIDS)	17.0	(1)
380090	Search, detection, tracking, and electronic communication systems and equipment (RADAR, SONAR, Optical)		(1)
380091	Flight, navigational, airframe, and engine indicators, instruments and clusters, including sensors, displays, etc.	46.5	(1)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic components	162.9	277.6
Matrix composites:			
190070	Resin	78.5	(1)
190071	Other, including ceramic, carbon, metal, etc.	84.7	(1)
372870	Complete mechanical, hydraulic, and pneumatic subassemblies	94.5	(1)
Fluid power products, excluding complete subassemblies:			
359412	Fluid power pumps, motors, and hydrostatic transmissions	15.3	20.5
349235	Valves	57.6	27.5
349261	Hose or tube fittings and assemblies	5.4	4.3
359303	Cylinders and rotary actuators	8.5	39.0
356921	Filters	4.6	(1)
190089	Other fluid power products	47.1	(1)
356200	Ball and roller bearings (mounted and unmounted)	48.9	35.8
354501	Cutting tools for machine tools	41.8	45.3
Fabricated metal products, except forgings:			
342973	Aircraft metal hardware	285.8	176.4
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	152.5	140.2
340050	Other fabricated metal products, except fluid power	251.2	(1)
Forgings:			
346200	Iron and steel	46.6	62.2
346310	Aluminum and aluminum-base alloy	79.8	119.1
346326	Titanium and titanium-base alloy	44.5	22.7
346001	Other forgings	37.0	10.1
Castings (rough and semifinished):			
332001	Iron and steel	45.8	75.3
336005	Aluminum and aluminum-base alloy	51.9	65.4
336003	Other nonferrous	54.7	26.8

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1992 and 1987—Con.

[Includes cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

Material code	Material	1992 delivered cost (million dollars)	1987 delivered cost (million dollars)
INDUSTRY 3728, AIRCRAFT PARTS AND EQUIPMENT, N.E.C.—Con.			
Shapes and forms, except castings, forgings, and fabricated metal products:			
Steel:			
331007	Bars, bar shapes, and plates	38.1	(1)
331022	Sheet and strip	22.6	(1)
331034	Other steel shapes and forms	10.4	178.1
Aluminum and aluminum-base alloy:			
335301	Sheet, plate, foil, and welded tubing	138.7	116.9
335011	All other (except sheet, plate, foil, and welded tubing)	75.3	90.5
332007	Copper and copper-base alloy shapes and forms	1.5	2.9
335601	Titanium and titanium-base alloy		21.7
335042	Other nonferrous shapes and forms	151.5	(1)
285101	Paints, varnishes, lacquers, stains, shellacs, japans, enamels, and allied products	(D)	20.8
970099	All other materials and components, parts, containers, and supplies	1 309.5	2 038.0
971000	Materials, ingredients, containers, and supplies, n.s.k. ³	817.5	741.2
INDUSTRY 3761, GUIDED MISSILES AND SPACE VEHICLES			
Materials, ingredients, containers, and supplies			
		5 240.9	5 966.2
376480	Guided missile and space vehicle engines and parts	624.1	49.1
376450	Guided missile and space vehicle propulsion units and parts	(D)	(1)
376920	Guided missile and space vehicle airframe parts	(D)	674.3
Avionics:			
366303	Radio communication systems and equipment, including airborne transmitters and receivers (microwave, UHF, VHF, etc.)		(1)
381260	Navigational systems and equipment (NAV AIDS)		(1)
380090	Search, detection, tracking, and electronic communication systems and equipment (RADAR, SONAR, Optical)	778.4	(1)
380091	Flight, navigational, airframe, and engine indicators, instruments, and clusters, including sensors, displays, etc.		(1)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic components	(D)	233.6
Matrix composites:			
190070	Resin	—	(1)
190071	Other, including carbon, ceramic, metal, etc.	8.4	(1)
372870	Complete mechanical, hydraulic, and pneumatic subassemblies	77.5	(1)
190090	Fluid power products	28.7	(1)
Fabricated metal products, except forgings:			
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	13.7	10.7
340078	Other fabricated metal products, except fluid power products	(D)	(1)
Forgings:			
346200	Iron and steel	(D)	.7
346300	Nonferrous	(D)	(1)
Castings (rough and semifinished):			
332001	Iron and steel		(1)
336005	Aluminum and aluminum-base alloy	13.6	37.1
336003	Other nonferrous		(2)
330090	Metal shapes and forms, except forgings, castings, and fabricated metal products	12.7	(1)
280071	Chemicals, all types (including propellants)	(D)	(1)
354430	Special dies, tools, die sets, jigs, and fixtures, except cutting tools for machine tools	(D)	(1)
970099	All other materials and components, parts, containers, and supplies	1 682.8	24 960.5
971000	Materials, ingredients, containers, and supplies, n.s.k. ³	816.4	.2
INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS			
Materials, ingredients, containers, and supplies			
		2 020.6	1 146.1
376480	Guided missile and space vehicle engines and parts		307.6
376450	Guided missile and space vehicle propulsion units and parts	393.5	(1)
376920	Guided missile and space vehicle airframe parts	—	113.7
Avionics:			
366303	Radio communication systems and equipment, including airborne transmitters and receivers (microwave, UHF, VHF, etc.)	—	(1)
381260	Navigational systems and equipment (NAV AIDS)	(D)	(1)
380090	Search, detection, tracking, and electronic communication systems and equipment (RADAR, SONAR, Optical)	—	(1)
380091	Flight, navigational, airframe, and engine indicators, instruments, and clusters, including sensors, displays, etc.	(D)	(1)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic components	5.4	7.7
Matrix composites:			
190070	Resin	(D)	(1)
190071	Other, including carbon, ceramic, metal, etc.	(D)	(1)
372870	Complete mechanical, hydraulic, and pneumatic subassemblies	(D)	(1)
190090	Fluid power products	(D)	9.9
Fabricated metal products, except forgings:			
345001	Bolts, nuts, screws, washers, rivets, and screw machine products	5.7	14.5
340078	Other fabricated metal products, except fluid power products	59.5	(1)
Forgings:			
346200	Iron and steel		14.3
346300	Nonferrous	26.7	(1)
Castings (rough and semifinished):			
332001	Iron and steel	6.0	11.9
336005	Aluminum and aluminum-base alloy	2.0	(2)
336003	Other nonferrous	2.4	(2)
330090	Metal shapes and forms, except forgings, castings, and fabricated metal products	9.5	(1)

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1992 and 1987—Con.

[Includes cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

Material code	Material	1992 delivered cost (million dollars)	1987 delivered cost (million dollars)
INDUSTRY 3764, SPACE PROPULSION UNITS AND PARTS— Con.			
280071	Chemicals, all types (including propellants) -----	(D)	(¹)
354430	Special dies, tools, die sets, jigs, and fixtures, except cutting tools for machine tools -----	7.2	(¹)
970099	All other materials and components, parts, containers, and supplies -----	372.8	² 625.1
971000	Materials, ingredients, containers, and supplies, n.s.k. ³ -----	813.3	41.4
INDUSTRY 3769, SPACE VEHICLE EQUIPMENT, N.E.C.			
Materials, ingredients, containers, and supplies -----		536.8	235.8
376480	Guided missile and space vehicle engines and parts -----	—	—
376450	Guided missile and space vehicle propulsion units and parts -----	(D)	(¹)
376920	Guided missile and space vehicle airframe parts -----	(D)	(¹)
Avionics:			
366303	Radio communication systems and equipment, including airborne transmitters and receivers (microwave, UHF, VHF, etc.) -----	—	(¹)
381260	Navigational systems and equipment (NAV AIDS) -----	—	(¹)
380090	Search, detection, tracking, and electronic communication systems and equipment (RADAR, SONAR, Optical) -----	—	(¹)
380091	Flight, navigational, airframe, and engine indicators, instruments, and clusters, including sensors, displays, etc. -----	—	(¹)
367004	Resistors, capacitors, transformers, electron tubes, semiconductors, and other electronic components -----	(D)	(¹)
Matrix composites:			
190070	Resin -----	8.4	(¹)
190071	Other, including carbon, ceramic, metal, etc. -----	(D)	(¹)
372870	Complete mechanical, hydraulic, and pneumatic subassemblies -----	(D)	(¹)
190090	Fluid power products -----	(D)	(¹)
Fabricated metal products, except forgings:			
345001	Bolts, nuts, screws, washers, rivets, and screw machine products -----	3.8	(¹)
340078	Other fabricated metal products, except fluid power products -----	9.8	(¹)
Forgings:			
346200	Iron and steel -----	5.1	(¹)
346300	Nonferrous -----	—	(¹)
Castings (rough and semifinished):			
332001	Iron and steel -----	(D)	(¹)
336005	Aluminum and aluminum-base alloy -----	(D)	(²)
336003	Other nonferrous -----	—	(²)
330090	Metal shapes and forms, except forgings, castings, and fabricated metal products -----	(D)	(¹)
280071	Chemicals, all types (including propellants) -----	1.1	(¹)
354430	Special dies, tools, die sets, jigs, and fixtures, except cutting tools for machine tools -----	(D)	(¹)
970099	All other materials and components, parts, containers, and supplies -----	238.0	² 209.1
971000	Materials, ingredients, containers, and supplies, n.s.k. ³ -----	217.1	26.7

¹For 1987, data were not collected separately and are included in 970099 of the industry in which the material was consumed.

²For 1987, data were included with material code 970099 to avoid disclosing data for individual companies.

³Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

⁴For 1992, materials were combined to avoid disclosing data for individual companies.

⁵For 1987, materials were combined to avoid disclosing data for individual companies.

⁶For 1992, materials were combined to avoid disclosing data for individual companies.

⁷For 1987, materials were combined to avoid disclosing data for individual companies.

Appendix A.

Explanation of Terms

This appendix is in two sections. Section 1 includes items requested of all establishments mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies, value added, classes of products, and specialization and coverage ratios) not included on the report forms but derived from information collected on the forms. Section 2 covers supplementary items requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in table 3c of this report.

SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

Number of establishments and companies. A separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operated at different physical locations, even if the individual locations were producing the same line of goods, a separate report was requested for each location. If the company operated in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on any employees, capital expenditures, inventories, or shipments from inventories during the year.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction of the *General Summary* subject report.

Employment and related items. The report forms requested separate information on production workers for a specific payroll period within each quarter of the year and on other employees as of the payroll period which included the 12th of March.

All employees. This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period which included the 12th of the months specified on the report form. Included are all persons on paid sick leave,

paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

Production workers. This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

All other employees. This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truckdrivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment engaged in the construction of major additions or alterations to the plant and utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls also was requested of auxiliary units (e.g., administrative offices, warehouses, and research and development

laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual industries shown in this report. They are included in the *General Summary* and geographic area reports as a separate category.

Payroll. This item includes the gross earnings of all employees on the payrolls of operating manufacturing establishments paid in the calendar year 1992. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations; it excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payrolls of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups.

Production-worker hours. This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

Cost of materials. This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by

others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

Specific materials consumed. In addition to the total cost of materials, which every establishment was required to report, information also was collected for most manufacturing industries on the consumption of major materials used in manufacturing. The inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information on the establishments consuming less than a specified amount (usually \$25,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which either administrative records or short forms were used was imputed as "not specified by kind." (See Census of Manufactures for the importance of administrative records in the industry.)

Value of shipments. This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

Individual products. As in previous censuses, data were collected for most industries on the quantity and value of individual products shipped. In the 1992 census program, information was collected on the output of almost 11,000 individual product items. The term "product," as used in the census of manufactures, represents the finest level of detail for which output information was requested. Consequently, it is not necessarily synonymous with the term "product" as used in the marketing sense. In some cases, it may be much more detailed and, in other cases, it is more aggregative. For example, "pharmaceutical preparations" was distributed into over 100 terms; whereas, "motor gasoline" was reported as a single item.

Approximately 6,300 of the product items were listed separately on the 1992 census report forms. Data for

about 4,500 products were obtained in the monthly, quarterly, or annual surveys comprising the Current Industrial Reports series of the Census Bureau. Totals for the year 1992 for these items, as derived from the commodity surveys, are shown in the "products shipped" table.

The list of products for which separate information was collected was prepared after consultation with industry and government representatives. Comparability with previous figures was given considerable weight in the selection of product categories so that comparable 1987 information is presented for most products.

Typically, both quantity and value of shipments information were collected. However, if quantity was not significant or could not be reported by manufacturers, only value of shipments was collected.

Shipments include both commercial shipments and transfers of products to other plants of the same company. For industries in which a considerable portion of the total shipments is transferred to other plants of the same company, separate information on interplant transfers also was collected. Moreover, for products that are used to a large degree within the same establishment as materials or components in the fabrication of other products, total production and often consumption of the item within the plant was collected. Typically, the information on production also was collected for products for which there are significant differences between total production and shipments in a given year because of wide fluctuations in finished goods inventories. Other measures of output of products with long production cycles were used as appropriate and feasible.

Classes of products. To summarize the product information, the separate products were aggregated into classes of products that, in turn, were grouped into all primary products of each industry. The code structure used is a seven-digit number for the individual product, a five-digit number for the class of product, and a four-digit number for the total primary products in an industry. (See Census of Manufactures, Industry Classification of Establishments, for application of the coding structure to the assignment of SIC codes for establishments.)

In the 1992 census, the 11,000 products were grouped into approximately 1,500 separate classes on the basis of general similarity of manufacturing processes, types of materials used, etc. However, the grouping of products was affected by the economic significance of the class and, in some cases, dissimilar products were grouped because the products were not sufficiently significant to warrant separate classes.

Duplication in cost of materials and value of shipments. The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication since the products of some industries are used as materials by others. This duplication results, in part, from the addition of related industries representing successive stages

in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the food group and the addition of pulp mills to paper mills in the paper and allied products group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the annual survey.

Duplication of products within individual industries is significant within a number of industry groups, e.g., machinery and transportation industries. These industries frequently include complete machinery and their parts. In this case, the parts made for original equipment are materials consumed for assembly plants in the same industry.

Even when no significant amount of duplication is involved, value of shipments figures are deficient as measures of the relative economic importance of individual manufacturing industries or geographic areas because of the wide variation in ratio of materials, labor, and other processing costs of value of shipments, both among industries and within the same industry.

Before 1962, cost of materials and value of shipments were not published for some industries which included considerable duplication. Since then, these data have been published for all industries at the U.S. level and beginning in 1964, for all geographic levels.

Value added by manufacture. This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1a), value added is adjusted only for the change in work-in-process inventories between the beginning and end of year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

New and used capital expenditures. For establishments in operation and any known plants under construction, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to

manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures include expenditures leased from nonmanufacturing concerns through capital leases. New facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations are excluded. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers also were requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred for the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in table 3b.

End-of-year inventories. Respondents were asked to report their 1991 and 1992 end-of-year inventories at cost or market. Effective with the 1982 Economic Census, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

The following items were collected only from establishments included in the ASM sample:

Supplemental labor costs. Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not specifically required by legislation whether they

Because of this change in reporting instructions, the 1982 through 1992 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing", which are aggregates of figures reported by establishments in specified industries.

Specialization and coverage ratios. These items are not collected on the report forms but are derived from the data shown in table 5b. An establishment is classified in a particular industry if its shipments of primary products of that industry exceed in value its shipments of the products of any other single industry.

An establishment's shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). Specialization and coverage ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in tables 1a through 5a and data on product shipments shown in tables 6a through 6c.

Specialization ratio represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments wherever classified.

were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans. They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees.

While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records generally do not provide reliable figures on net employee benefits of these types.

Retirements of depreciable assets. Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1992. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent also was requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.

Depreciation charges for fixed assets. This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.

Rental payments. Total rental payments is collected on all census forms. However, the breakdown between rental payments for buildings and other structures and rental payments for machinery and equipment is collected only on the ASM forms. This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

Depreciable assets. Total value of gross depreciable assets is collected on all census forms. However, the detail for depreciable assets is collected only on the ASM forms. The data encompass all fixed depreciable assets on the books of establishments at the beginning and end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all

buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are nondepreciable capital assets, including inventories and intangible assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

New and used capital expenditures. The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)

Quantity of electric energy consumed for heat and power. Data on the cost of purchased electric energy are collected on all census forms. However, data on the quantity of purchased electric energy are collected only on the ASM forms. In addition, information is collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.

Breakdown of new capital expenditures for machinery and equipment. ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement. Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

Foreign content of cost of materials. Establishments included in the ASM sample panel were requested to provide information on foreign-made materials purchased or transferred from foreign sources. This includes materials acquired from a central warehouse or other domestic establishment of the same company but made in an operation outside of the 50 States, District of Columbia, Puerto Rico, or U.S. territories.

Cost of purchased services. ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, communication services, legal services, accounting and bookkeeping services, advertising, software and other data processing services, and refuse removal. Each of these items reflect the costs paid directly by the establishment, and exclude salaries paid to employees of the establishment for these services.

Included in the cost of purchased services for the repair of buildings and machinery are payments made for all maintenance and repair work on buildings and equipment, such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property also are included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract or incurred directly by an establishment in using its own work force also are excluded.

Included in the cost of purchased advertising services are payments for printing, media coverage, and other advertising services and materials.

Included in the cost of purchased software and other data processing services are all purchases by the establishment from other companies. Excluded are services provided by other establishments of the same company (such as by a separate data processing unit).

Included in the cost of purchased refuse removal services are all costs of refuse removal services paid by the establishment, including costs for hazardous waste removal or treatment. Excluded are all costs included in rental payments or as capital expenditures.

Three basic approaches were utilized to produce these statistics.

1. For items 1 through 6, data were estimated (imputed) for all non-ASM establishments using the available data in the establishment record and industry-based parameters. The statistics were then generated by simply tabulating all census records including the imputed value for non-ASM establishments and the unweighted value for ASM establishments. Separate imputation rates were developed and are shown in the table. For quantity of purchased electricity for heat and power (item 7), a similar procedure was used; however, the imputation parameters were geographically-based instead of industry-based. For quantities of generated less sold electricity, no imputation was performed for non-ASM establishments. The estimates for these items are simply tabulations of unweighted ASM values.

Since the published statistics for these items were developed from the complete census universe and not just the ASM establishments, there are no sampling variances associated with these statistics. However, there is an unknown level of bias for each of the items due to the imputation of the non-ASM establishments. This bias is felt to be small due to the strong correlation between the items being imputed and the collected items that were used to generate the impute values.

2. For items 8 and 9, the estimates were developed using a ratio estimation methodology. For item 8, an estimate of the breakout of new capital expenditures for machinery and equipment into the three categories was made from ASM establishments reporting these categories. The estimated proportions were then applied to the corresponding census value for new capital expenditures for machinery and equipment to produce the estimates.

The estimates for item 9, foreign content of cost of materials, were developed in a similar manner based on costs of parts, supplies, and components (item 5a) as the control total for the three categories.

For items 8 and 9, an adjustment ratio of the following form was computed:

$$R_j = \frac{NMc}{TMEasm}$$

where:

NMc = the census value of new capital expenditures for machinery and equipment

TMEasm = the weighted ASM value of new capital expenditures for machinery and equipment from reporters of the detailed breakout data

3. For item 10, cost of purchased services, the estimates were made by simply tabulating weighted data for all the ASM records that reported the item. A response coverage ratio (a measure of the extent to which respondents reported for each item) is shown in table 3c for the types of services. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight, see appendix B) for those ASM establishments that reported the specific inquiry to the weighted total employment for all ASM establishments classified in the industry.

Appendix B.

Annual Survey of Manufactures Sampling and Estimating Methodologies

DESCRIPTION OF SURVEY SAMPLE

The annual survey of manufactures (ASM) contains two components. The mail portion of the survey is a probability sample of about 64,000 manufacturing establishments selected from a total of about 216,000 establishments. These 216,000 establishments represent all manufacturing establishments of multiunit companies and all single-establishment companies mailed schedules in the 1987 Census of Manufactures. This mail portion is supplemented annually by a Social Security Administration list of new manufacturing establishments opened after 1987 and a list of new multiunit manufacturing establishments identified from the Census Bureau's Company Organization Survey.

For the current panel, all establishments of companies with 1987 shipments in manufacturing in excess of \$500 million were included in the survey panel with certainty. There are approximately 500 such companies collectively accounting for approximately 18,000 establishments. For the remaining portion of the mail survey, the establishment was defined as the sampling unit. For this portion, all establishments with 250 employees or more and establishments with a very large value of shipments also were included in the survey panel with certainty. A total of 12,100 establishments were selected from this portion of the universe with certainty. Therefore, of the 64,000 manufacturing establishments included in the ASM panel, approximately 31,000 are selected with certainty. These certainty establishments collectively account for approximately 80 percent of the total value of shipments in the 1987 census.

Smaller establishments in the remaining portion of the mail survey were sampled with probabilities ranging from 0.999 to 0.005 in accordance with mathematical theory for optimum allocation of a sample. The probabilities of selection assigned to the smaller establishments were proportional to measures of size determined for each establishment. The measures of size depend directly upon each establishment's 1987 product class values and the historic variability of the year-to-year shipments of each product class. Product classes displaying more volatile year-to-year change in shipments at the establishment level were sampled at a heavier rate.

This method of assigning measures of size was used in order to maximize the precision (that is, minimize the variance of estimates of the year-to-year change) in the value of product class shipments. Implicitly, it also gave weight differences in employment, value added, and other

general statistics, since these are highly correlated with value of shipments. Individual sample selection probabilities were obtained by multiplying each establishment's final measure of size by an overall sampling fraction coefficient calculated to yield a total expected sample size.

The sample selection procedure gave each establishment in the sampling frame an independent chance of selection. This method of independent selection permits the rotation of small establishments out of a given sample panel without introducing a bias into the survey estimates.

The nonmail portion of the survey includes all single-establishment companies that were tabulated as administrative records in the 1987 Census of Manufactures. Although this portion contained approximately 134,000 establishments, it accounted for less than 2 percent of the estimate for total value of shipments at the total manufacturing level. This portion was not sampled; rather, the data for every establishment in this group were estimated based on selected information obtained annually from the administrative records of the Internal Revenue Service and the Social Security Administration. This administrative-records information, which includes payroll, total employment, industry classification, and physical location of the establishment, was obtained under conditions which safeguard the confidentiality of both tax and census records. Estimates of data other than payroll and employment for these small establishments were developed from industry averages.

The corresponding estimates for the mail and nonmail establishments were added together, along with the base-year differences, as defined in the Description of Estimating Procedure section, to produce the figures shown in this publication.

DESCRIPTION OF ESTIMATING PROCEDURES

Most of the ASM estimates for the years 1988-1991 were computed using a difference estimation procedure. For each item, a base-year difference was developed. This base-year difference is equal to the difference between the 1987 census published number for an item total and the linear ASM estimate of the total for 1987. The ASM linear estimate was obtained by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values.

These base-year differences were then added to the corresponding current-year linear estimates, which include the sum of the estimates for the mail and nonmail

establishments, to produce the estimates for the years 1983-1991. Estimates developed by this procedure usually are far more reliable than comparable linear estimates developed from the current sample data alone.

However, the 1992 sample estimates for the purchased service items, shown in table 3c, are strictly ASM linear estimates developed only from ASM establishments that reported the specific item.

The remaining estimates in table 3c, showing the breakdown of expenditures for new machinery and equipment and costs of parts (separated into purchases from foreign sources and purchases from domestic sources), were computed as ratio estimates. To do this, linear estimates of the new machinery detail items were developed from the ASM establishments and were ratio adjusted to the corresponding census total for new machinery. In a similar fashion, the ASM linear estimates of the detailed purchased materials items were ratio adjusted to the corresponding census total for cost of parts.

QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. They are presented in the form of relative standard errors (the standard errors divided by the estimated values to which they refer).

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

The complete-coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
2. From two standard errors below to two standard errors above the derived estimate for about 19 of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total, about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total and almost certain confidence that the interval 47,000 to 53,000 includes the complete-coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors also would occur if a complete canvass were to be conducted under the same conditions as the survey. Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Census Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.

Appendix C. Product Code Reference Tables

Part 1. Comparability of Product Classes and Product Codes That Changed: 1992 to 1987

1992	1987	1992	1987	1992	1987	1992	1987
37111	37115	37119	37112	3714A 33	3714A 19	37327 06	37327 05
37111 71	37115 00	37119 00	37112 01	3714A 35	3714A 19	37327 08	37327 07
		37119 00	37112 02	3714A 37	3714A 19	37327 12	37327 09
37113 04	37113 01	37119 00	37112 03	3714A 39	3714A 19	37327 17	37327 11
37113 04	37113 02	37119 00	37112 04	3714A 41	3714A 05	37327 17	37327 13
		37119 00	37112 05	3714A 41	3714A 08	37327 17	37327 15
		37119 00	37112 06	3714A 41	3714A 12		
37116	37112	37119 00	37112 07	3714A 41	3714A 19	37431 01	37431 30
37116 00	37112 01	37119 00	37112 08			37431 01	37431 60
37116 00	37112 02	37119 00	37112 09	37152 00	37152 01	37431 03	37431 11
37116 00	37112 03	37119 00	37112 31	37152 00	37152 02	37431 03	37431 12
37116 00	37112 04					37431 03	37431 15
37116 00	37112 05	37119 00	37112 32	37284	37281	37431 03	37431 17
37116 00	37112 06	37119 00	37112 33	37284 73	37281 73	37431 03	37431 18
37116 00	37112 07	37119 00	37112 34	37284 75	37281 75		
37116 00	37112 08	37119 00	37112 35	37284 83	37281 83	37432 35	37432 31
37116 00	37112 09	37119 00	37112 36	37284 85	37281 85	37432 35	37432 33
37116 00	37112 31	37119 00	37112 39			37432 65	37432 25
				37285	37281	37432 65	37432 50
37116 00	37112 32	37131 12	37131 03	37285 13	37281 13	37432 65	37432 52
37116 00	37112 33	37131 12	37131 04	37285 15	37281 15	37432 65	37432 63
37116 00	37112 34	37131 12	37131 11	37285 94	37281 94		
37116 00	37112 35	37131 12	37131 13	37285 95	37281 95	37433 05	37433 02
37116 00	37112 36	37131 71	37131 06	37285 98	37281 98	37433 05	37433 03
37116 00	37112 39	37131 71	37131 07	37285 99	37281 99	37433 19	37433 13
		37131 71	37131 49			37433 19	37433 15
		37131 71	37131 57	37311 11	37311 01		
37117	37112	37131 71	37131 69	37311 11	37311 02	37511 23	37511 19
37117 00	37112 01			37311 11	37311 03	37511 39	37511 06
37117 00	37112 02	37132 11	37132 02	37311 11	37311 04	37511 41	37511 06
37117 00	37112 03	37132 13	37132 05	37311 19	37311 05	37511 43	37511 06
37117 00	37112 04	37132 13	37132 06	37311 19	37311 06	37511 45	37511 06
37117 00	37112 05	37132 13	37132 07	37311 19	37311 09	37511 47	37511 01
37117 00	37112 06	37132 13	37132 08			37511 47	37511 02
37117 00	37112 07	37132 13	37132 09			37511 47	37511 03
37117 00	37112 08	37132 39	37132 02	37313 28	37313 25	37511 47	37511 04
37117 00	37112 09	37132 39	37132 03	37313 28	37313 29	37511 47	37511 04
37117 00	37112 31	37132 39	37132 16	37313 48	37313 41	37511 47	37511 05
		37132 39	37132 19	37313 48	37313 49	37511 49	37511 01
37117 00	37112 32	37132 39	37132 21	37313 57	37313 51	37511 49	37511 02
37117 00	37112 33	37132 39	37132 21	37313 57	37313 53	37511 49	37511 03
37117 00	37112 34	37132 39	37132 28	37313 57	37313 55	37511 49	37511 04
37117 00	37112 35	37132 39	37132 29			37511 49	37511 05
37117 00	37112 36	37132 39	37132 31	37322 19	37322 05	37511 55	37511 06
37117 00	37112 39			37322 19	37322 09		
		37142 17	37142 21	37322 19	37322 13	37512 09	37512 06
37118	37112	37142 22	37142 23			37512 09	37512 07
37118 00	37112 01	37142 37	37142 38	37323 04	37323 03		
37118 00	37112 02	37142 37	37142 39	37323 04	37323 05	37616	37615
37118 00	37112 03	37142 49	37142 19	37323 11	37323 07	37616 00	37615 01
37118 00	37112 04	37142 49	37142 21	37323 11	37323 09		
37118 00	37112 05	37142 49	37142 23	37323 16	37323 13	37617	37615
37118 00	37112 06	37142 49	37142 29	37323 16	37323 15	37617 02	37615 02
37118 00	37112 07	37142 49	37142 29	37323 21	37323 17	37617 03	37615 03
37118 00	37112 08	37142 49	37142 48	37323 21	37323 19		
37118 00	37112 09	37149 31	37149 39			37996 07	37996 03
37118 00	37112 31	37149 41	37149 39	37327 02	37327 01	37996 07	37996 08
				37327 02	37327 03		
37118 00	37112 32	3714A 23	3714A 01	37327 02	37327 05	37999 23	37999 01
37118 00	37112 33	3714A 25	3714A 01	37327 02	37327 07	37999 23	37999 06
37118 00	37112 34	3714A 27	3714A 07	37327 02	37327 09	37999 23	37999 19
37118 00	37112 35	3714A 29	3714A 13	37327 02	37327 01	37999 25	37999 02
37118 00	37112 36	3714A 31	3714A 07	37327 04	37327 03	37999 25	37999 21
37118 00	37112 39	3714A 31	3714A 13	37327 04	37327 03		

Part 2. Comparability of Product Classes and Product Codes That Changed: 1987 to 1992

1987	1992	1987	1992	1987	1992	1987	1992
37112	37116	37112 35	37116 00	3714A 12	3714A 41	37327 09	37327 02
37112	37117	37112 35	37117 00	3714A 13	3714A 29	37327 09	37327 12
37112	37118	37112 35	37118 00	3714A 13	3714A 31	37327 11	37327 17
37112	37119	37112 36	37119 00	3714A 19	3714A 33	37327 13	37327 17
37112 01	37116 00	37112 36	37116 00	3714A 19	3714A 35	37327 15	37327 17
37112 01	37117 00	37112 36	37117 00	3714A 19	3714A 37		
37112 01	37118 00	37112 36	37118 00	3714A 19	3714A 39	37431 11	37431 03
37112 01	37119 00	37112 39	37119 00	3714A 19	3714A 41	37431 12	37431 03
37112 02	37116 00	37112 39	37116 00			37431 15	37431 03
37112 02	37117 00	37112 39	37117 00	37152 01	37152 00	37431 17	37431 03
37112 02	37118 00	37112 39	37118 00	37152 02	37152 00	37431 18	37431 03
37112 02	37119 00	37112 39	37119 00			37431 30	37431 01
37112 03	37116 00	37113 01	37113 04	37281	37284	37431 60	37431 01
37112 03	37117 00	37113 02	37113 04				
37112 03	37118 00	37113 01		37281	37285	37432 25	37432 65
37112 03	37119 00	37115	37111	37281 13	37285 13	37432 31	37432 35
37112 03	37117 00	37115 00	37111 71	37281 15	37285 15	37432 33	37432 35
37112 03	37118 00			37281 73	37284 73	37432 50	37432 65
37112 03	37119 00	37131 03	37131 12	37281 75	37284 75	37432 52	37432 65
37112 03	37116 00	37131 04	37131 12	37281 83	37284 83	37432 63	37432 65
37112 04	37117 00	37131 06	37131 71	37281 85	37284 85		
37112 04	37118 00	37131 07	37131 71	37281 94	37285 94	37433 02	37433 05
37112 04	37119 00	37131 11	37131 12	37281 95	37285 95	37433 03	37433 05
37112 05	37116 00	37131 13	37131 12	37281 98	37285 98	37433 13	37433 19
37112 05	37117 00	37131 49	37131 71	37281 99	37285 99	37433 15	37433 19
37112 05	37118 00	37131 57	37131 71				
37112 05	37119 00	37131 69	37131 71	37311 01	37311 11	37511 01	37511 47
37112 06	37116 00	37132 02	37132 11	37311 02	37311 11	37511 01	37511 49
37112 06	37117 00	37132 02	37132 39	37311 03	37311 11	37511 02	37511 47
37112 06	37118 00	37132 03	37132 39	37311 04	37311 11	37511 02	37511 49
37112 06	37119 00	37132 05	37132 13	37311 05	37311 19	37511 03	37511 47
37112 07	37116 00	37132 06	37132 13	37311 06	37311 19	37511 03	37511 49
37112 07	37117 00	37132 07	37132 13	37311 09	37311 19	37511 04	37511 47
37112 07	37118 00	37132 08	37132 13			37511 04	37511 49
37112 07	37119 00	37132 09	37132 13	37313 25	37313 28	37511 05	37511 47
37112 07	37116 00	37132 16	37132 39	37313 29	37313 28	37511 05	37511 49
37112 08	37117 00	37132 19	37132 39	37313 41	37313 48	37511 06	37511 39
37112 08	37118 00	37132 21	37132 39	37313 49	37313 48		
37112 08	37119 00	37132 28	37132 39	37313 51	37313 57	37511 06	37511 41
37112 08	37116 00	37132 29	37132 39	37313 53	37313 57	37511 06	37511 43
37112 09	37117 00	37132 31	37132 39	37313 55	37313 57	37511 06	37511 45
37112 09	37118 00					37511 06	37511 55
37112 09	37119 00			37322 05	37322 19	37511 19	37511 23
37112 09	37116 00			37322 09	37322 19		
37112 09	37117 00	37142 19	37142 49	37322 13	37322 19	37512 06	37512 09
37112 31	37118 00	37142 21	37142 17			37512 07	37512 09
37112 31	37119 00	37142 21	37142 49				
37112 31	37116 00	37142 23	37142 22	37323 03	37323 04		
37112 31	37117 00	37142 23	37142 49	37323 05	37323 04	37615	37616
37112 31	37118 00	37142 29	37142 49	37323 07	37323 11		
37112 31	37119 00	37142 38	37142 49	37323 09	37323 11	37615	37617
37112 32	37116 00	37142 29	37142 37	37323 13	37323 16		
37112 32	37117 00	37142 39	37142 37	37323 15	37323 16	37615 01	37616 00
37112 32	37118 00	37142 48	37142 49	37323 17	37323 21	37615 02	37617 02
37112 32	37119 00			37323 19	37323 21	37615 03	37617 03
37112 33	37116 00	37149 39	37149 31				
37112 33	37117 00	37149 39	37149 41				
37112 33	37118 00			37327 01	37327 02	37996 03	37996 07
37112 33	37119 00	3714A 01	3714A 23	37327 01	37327 04	37996 08	37996 07
37112 33	37116 00	3714A 01	3714A 25	37327 03	37327 02		
37112 34	37117 00	3714A 05	3714A 41	37327 03	37327 04	37999 01	37999 23
37112 34	37118 00	3714A 07	3714A 27	37327 05	37327 02	37999 02	37999 25
37112 34	37119 00	3714A 07	3714A 31	37327 05	37327 06	37999 06	37999 23
37112 34	37116 00	3714A 08	3714A 41	37327 07	37327 02	37999 19	37999 23
37112 34	37117 00			37327 07	37327 08	37999 21	37999 25

Part 3. Current Industrial Reports by Product Code

[Current Industrial Reports (CIR) data are contained in the publication *Manufacturing Profiles: 1992* [MP-1(92)] issued August 1994 and available through the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. To access the most current CIR data electronically, dial the Census-BEA Electronic Forum at 301-457-2310. Your communications modem should be set as follows: Baud rate: 1200, 2400, 9600; Parity: None; Data bits: 8; Stop bits: 1; Duplex: full. Before making your first call, decide on a password and be prepared to provide the following regarding your computer: PC brand name, monitor screen dimensions (e.g., 80 columns by 24 lines), monitor color support, modem baud rate, and PC communications software package. Call the voice number, 301-457-1242, for further bulletin board assistance]

Product code	Current Industrial Report
3715100	M37L, Truck Trailers
3721500	M37G, Civil Aircraft and Engines
3724200	M37G, Civil Aircraft and Engines

Publication Program

1992 CENSUS OF MANUFACTURES

Publications of the 1992 Census of Manufactures, containing preliminary and final data on manufacturing establishments in the United States, are described below. Publications order forms for the specific reports may be obtained from any Department of Commerce district office or from Data User Services Division, Customer Services, Bureau of the Census, Washington, DC 20233-8300.

Preliminary Reports

Industry series—83 reports (MC92-I-20A(P) to -39D(P))

Preliminary industry data are issued in 83 separate reports covering 459 industries. Preliminary summary data for the United States and States are released in one report.

Final Reports

Industry series—83 reports (MC92-1-20A to -39D)

Each of the 83 reports provides information for a group of related industries ("dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 459 manufacturing industries on quantity and value of products shipped and materials consumed, cost of fuels and electric energy, capital expenditures, assets, rents, inventories, employment, payroll, payroll supplements, hours worked, value added by manufacture, number of establishments, and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacture, capital expenditures, employment, and payroll are shown by employment-size class of establishment, State, and degree of primary product specialization.

Geographic area series—51 reports (MC92-A-1 to -51)

A separate report is being published for each State and the District of Columbia. Each report presents data for industry groups and industries on value of shipments, cost of materials, value added by manufacture, employment, payroll, hours worked, new capital expenditures, and number of manufacturing establishments for the State, MA's, counties, and selected places. Comparative statistics for earlier census years are shown for the State and large MA's. Manufacturing totals are presented for each county and for places with significant manufacturing activity. Detailed statistics (including inventories, assets, rents, and energy costs) are presented only in statewide totals.

Subject series—3 reports (MC92-S-1 to -3)

Each of the three reports contains detailed statistics for an individual subject, such as concentration ratios in manufacturing, manufacturers' shipments to the Federal Government, and a general national-level summary.

Reference series—1 report (MC92-R-1)

The *Numerical List of Manufactured and Mineral Products* includes a description of the principal products and services published in the 1992 Censuses of Manufactures and Mineral Industries.

Location of Manufacturing Plants—1 report (MC92-LM)

This report includes data for number of establishments by four-digit SIC industry and by employment-size class for counties, incorporated places of 2,500 inhabitants or more, and Zip Codes for each State. This report is available only on compact disc-read only memory (CD-ROM).

Analytical Reports—2 reports (AR92-1 and -2)

Exports From Manufacturing Establishments (AR92-1)

This report presents data on exports by two- and three-digit SIC industry groups for the United States and States. Information is presented on value of direct report shipments and estimates of the employment required to manufacture these products. Included are estimates of employment in manufacturing and nonmanufacturing establishments that supply parts, materials, and services for production of manufactured exports.

Selected Characteristics of Manufacturing Establishments That Export (AR92-2)

This report presents data on the number of manufacturing companies and establishments that export by major group, State, employment size, and ratios of exports to shipments.

Electronic Media

All data included in the printed reports are available on CD-ROM. The CD-ROM's provide the same information found in the reports as well as additional information not published in the final reports, such as location of manufacturing plants. Electronic media products are available for users who wish to summarize, rearrange, or process large amounts of data. These products, with corresponding technical documentation, are sold by Data User Services Division, Customer Services, Bureau of the Census, Washington, DC 20233-8300.

OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, financial, insurance, real estate, service industries, construction industries, mineral industries, transportation, communications, utilities, enterprise statistics, minority-owned businesses, and women-owned businesses also are available from the 1992 Economic Census. A separate series of reports covers the census of outlying areas—Puerto Rico, Virgin Islands of the United States, Guam, and the Commonwealth of the Northern Mariana Islands. Separate announcements describing these reports are available free of charge from Data User Services Division, Customer Services, Bureau of the Census, Washington, DC 20233-8300.