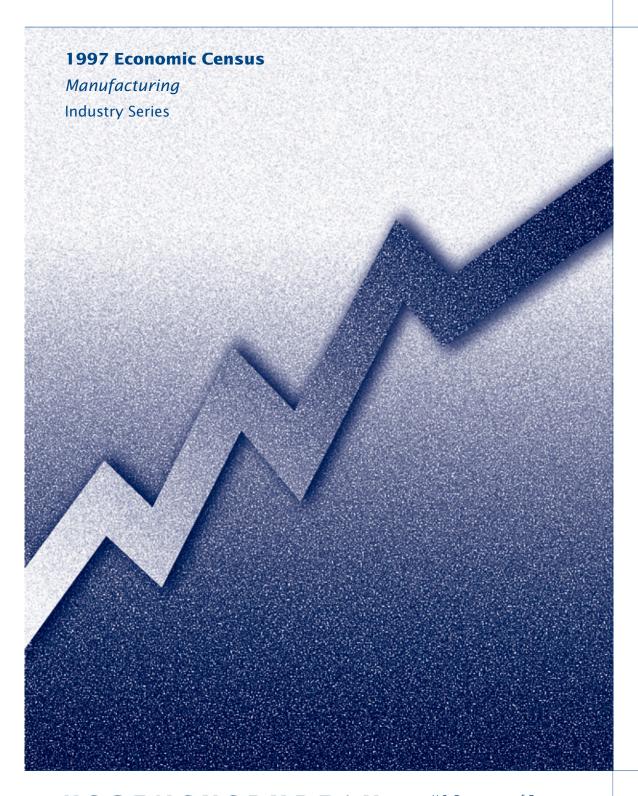
Heating Equipment (Except Warm Air Furnaces) Manufacturing

1997

Issued November 1999

EC97M-3334C



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1997 Economic Census

Manufacturing
Industry Series





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

- Policymaking agencies of the Federal Government use the data to monitor economic activity and assess the effectiveness of policies.
- 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, which allows them to 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.

ALL-NEW INDUSTRY CLASSIFICATIONS

Data from the 1997 Economic Census are published primarily on the basis of the North American Industry Classification System (NAICS), unlike earlier censuses, which were published according to the Standard Industrial Classification (SIC) system. NAICS is in the process of being adopted in the United States, Canada, and Mexico. Most economic census reports cover one of the following NAICS sectors:

21	Mining
22	Utilities
23	Construction
31-33	Manufacturing
42	Wholesale Trade
44-45	Retail Trade
48-49	Transportation and Warehousing
51	Information

52 Finance and Insurance 53

Real Estate and Rental and Leasing 54 Professional, Scientific, and Technical Services

55 Management of Companies and Enterprises 56 Administrative and Support and Waste

Management and Remediation Services

61 **Educational Services**

Health Care and Social Assistance 62

Arts. Entertainment, and Recreation 71

72 Accommodation and Foodservices

Other Services (except Public Administration)

(Not listed above are the Agriculture, Forestry, Fishing, and Hunting sector (NAICS 11), partially covered by the census of agriculture conducted by the U.S. Department of Agriculture, and the Public Administration sector (NAICS 92), covered by the census of governments conducted by the Census Bureau.)

The 20 NAICS sectors are subdivided into 96 subsectors (three-digit codes), 313 industry groups (four-digit codes), and, as implemented in the United States, 1170 industries (five- and six-digit codes).

RELATIONSHIP TO SIC

While many of the individual NAICS industries correspond directly to industries as defined under the SIC system, most of the higher level groupings do not. Particular care should be taken in comparing data for retail trade, wholesale trade, and manufacturing, which are sector titles used in both NAICS and SIC, but cover somewhat different groups of industries. The industry definitions discuss the relationships between NAICS and SIC industries. Where changes are significant, it will not be possible to construct time series that include data for points both before and after 1997.

For 1997, data for auxiliary establishments (those functioning primarily to manage, service, or support the activities of their company's operating establishments, such as a central administrative office or warehouse) will not be included in the sector-specific reports. These data will be published separately.

GEOGRAPHIC AREA CODING

Accurate and complete information on the physical location of each establishment is required to tabulate the census data for the states, metropolitan areas (MAs), counties, parishes, and corporate municipalities including cities, towns, villages, and boroughs. Respondents were

required to report their physical location (street address, municipality, county, and state) if it differed from their mailing address. For establishments not surveyed by mail (and those single-establishment companies that did not provide acceptable information on physical location), location information from Internal Revenue Service tax forms is used as a basis for coding.

BASIS OF REPORTING

The economic census is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each store, factory, shop, or other location. Each establishment is assigned a separate industry classification based on its primary activity and not that of its parent company.

DOLLAR VALUES

All dollar values presented are expressed in current dollars; i.e., 1997 data are expressed in 1997 dollars, and 1992 data, in 1992 dollars. Consequently, when making comparisons with prior years, users of the data should consider the changes in prices that have occurred.

All dollar values are shown in thousands of dollars.

AVAILABILITY OF ADDITIONAL DATA

Reports in Print and Electronic Media

All results of the 1997 Economic Census are available on the Census Bureau Internet site (www.census.gov) and on compact discs (CD-ROM) for sale by the Census Bureau. Unlike previous censuses, only selected highlights are published in printed reports. For more information, including a description of electronic and printed reports being issued, see the Internet site, or write to U.S. Census Bureau, Washington, DC 20233-8300, or call Customer Services at 301-457-4100.

Special Tabulations

Special tabulations of data collected in the 1997 Economic Census may be obtained, depending on availability of time and personnel, in electronic or tabular form. The data will be summaries 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) that govern 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 of the division named below, U.S. Census Bureau, Washington, DC 20233-8300. To discuss a special tabulation before submitting specifications, call the appropriate division:

Manufacturing and Construction Division Service Sector Statistics Division

301-457-4673 301-457-2668

HISTORICAL INFORMATION

The economic census has been taken as an integrated program at 5-year intervals since 1967 and before that for 1954, 1958, and 1963. Prior to that time, individual components 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 the 1840 Decennial Census and subsequent censuses to include mining and some commercial activities. The 1905 Manufactures Census was the first time a census was taken apart from the regular decennial population census. Censuses covering retail and wholesale trade and construction industries were added in 1930, as were some covering service trades in 1933. Censuses of construction, manufacturing, and the other business service censuses were suspended during World War II.

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 range of industries covered in the economic censuses expanded between 1967 and 1992. The census of construction industries began on a regular basis in 1967, and the scope of service industries, introduced in 1933, was broadened in 1967, 1977, and 1987. While a few transportation industries were covered as early as 1963, it was not until 1992 that the census broadened to include all of transportation, communications, and utilities. Also new for 1992 was coverage of financial, insurance, and real estate industries. With these additions, the economic census and the separate census of governments and census of agriculture collectively covered roughly 98 percent of all economic activity.

Printed statistical reports from the 1992 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 reports printed since 1967 are still available for sale on microfiche from the Census Bureau. CD-ROMs issued from the 1987 and 1992 Economic Censuses contain databases including nearly all data published in print, plus additional statistics, such as ZIP Code statistics, published only on CD-ROM.

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 1997 Economic Census and Related Statistics at www.census.gov/econquide. More information on the methodology, procedures, and history of the censuses will be published in the History of the 1997 Economic Census at www.census.gov/econ/www/history.html.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used with the 1997 Economic Census data:

- Α Standard error of 100 percent or more.
- D Withheld to avoid disclosing data of individual companies; data are included in higher level totals.
- F Exceeds 100 percent because data include establishments with payroll exceeding rev-
- Ν Not available or not comparable.
- Revenue not collected at this level of detail for Q multiestablishment firms.
- S Withheld because estimates did not meet publication standards.

- V Represents less than 50 vehicles or .05 percent.
- Χ Not applicable.
- Υ Disclosure withheld because of insufficient
 - coverage of merchandise lines.
- Ζ Less than half the unit shown. 0 to 19 employees.
- a b
- 20 to 99 employees.
- 100 to 249 employees. C
- 250 to 499 employees. e
- f 500 to 999 employees.
- 1,000 to 2,499 employees. g
- h 2,500 to 4,999 employees.
- 5,000 to 9,999 employees.
- 10,000 to 24,999 employees.
- k 25,000 to 49,999 employees.
- 50,000 to 99,999 employees.
- 100,000 employees or more. m
- 10 to 19 percent estimated.
- р q 20 to 29 percent estimated.
- Revised. r
- Sampling error exceeds 40 percent.
- Not elsewhere classified. nec
- Not specified by kind. nsk
- Represents zero (page image/print only).
- (CC) Consolidated city.
- Independent city. (IC)

1997 ECONOMIC CENSUS INTRODUCTION 3 This page is intentionally blank.

Manufacturing

SCOPE

The 1997 Economic Census – Manufacturing covers all manufacturing establishments with one or more paid employees. Manufacturing is defined as the mechanical, physical, or chemical transformation of materials or substances into new products. The assembly of components into new products is also considered manufacturing, except when it is appropriately classified as construction.

Establishments in the manufacturing sector are often described as plants, factories, or mills and typically use power-driven machines and materials-handling equipment. Also included in the manufacturing sector are some establishments that make products by hand, like custom tailors and the makers of custom draperies. While manufacturers typically do not sell to the public, some establishments like bakeries and candy stores that make products on the premises may be included.

While logging and publishing are no longer in the scope of manufacturing, data for these industries are included in the manufacturing industry reports, but are not included in the manufacturing state, summary, and other reports.

GENERAL

This report, from the 1997 Economic Census – Manufacturing, is one of a series of 480 industry reports and 51 geographic area reports, each of which provides statistics for individual industries or states, respectively. Seven of the industry reports are for industries no longer in the manufacturing sector but are included with manufacturing for the 1997 census year. Also included for this sector are General, Product, and Materials Consumed Summary reports, a special report on Concentration Ratios in Manufacturing, and data files on Location of Manufacturing Plants.

Each industry report presents data for a six-digit North American Industry Classification System (NAICS) industry. A description of the particular NAICS industry may be found in Appendix B. These reports include such statistics as number of establishments, employment, payroll, value added by manufacture, cost of materials consumed, value of shipments, capital expenditures, etc. Explanations of these and other terms may be found in Appendix A. The industry reports also include data for states with 100 employees or more in the industry.

State reports, which include the District of Columbia, present similar statistics at the "all manufacturing" level for each state and its metropolitan areas (MAs) with 250

employees or more, and for counties, consolidated cities, and places with 500 employees or more. The state reports also include six-digit NAICS level data for industries with 100 employees or more in the state.

The General Summary report contains industry and geographic area statistics summarized in one report. It includes higher levels of aggregation than the industry and state reports, as well as revisions to the data made after the release of the industry and state reports.

The Products and Materials Consumed reports summarize the products and materials data published in the industry reports. The Product Summary report also includes data from the Current Industrial Reports (CIR) and a special table with data for products that are primary to more than one industry, which are not in the industry reports.

The Concentration Ratios report publishes data on the percentage of value of shipments accounted for by the 4-, 8-, 20-, and 50-largest companies for each manufacturing industry. Also shown in this report are Hirschmann-Herfindahl Indexes for each industry.

The Location of Manufacturing data files contain statistics on the number of establishments for the three- and six-digit NAICS industry by state, county, place, and ZIP Code by employment-size of the establishment.

GEOGRAPHIC AREAS COVERED

Statistics at the six-digit NAICS industry level are shown for states and the District of Columbia in both the state and industry reports for cells with 100 employees or more

The state reports also include data at the "all manufacturing" level for a variety of geographies that meet the employment criteria.

Data are available for the metropolitan areas (MAs) with 250 employees or more. The term MA is a general term used to encompass all of the specifically defined metropolitan areas. A consolidated metropolitan statistical area (CMSA) is made up of two or more contiguous primary metropolitan statistical areas (PMSAs) with a combined population of at least 1 million. A PMSA is a subdivision of a CMSA that demonstrates very strong internal economic and social links separate from the ties to other portions of the CMSA. A metropolitan statistical area (MSA) is an integrated economic and social unit with a population of at least 50,000. An MA is made up of one or more counties meeting standards of metropolitan character. In New England, cities and towns, rather than counties, are the

U.S. Census Bureau, 1997 Economic Census

component geographic units. Determination of the MAs was made by the Office of Management and Budget (OMB) as of June 30, 1997. The population estimates were from the 1990 Census of Population or a subsequent special census. When applicable, the make-up of an MA is included in Appendix E. Changes to geographical boundaries are noted in Appendix D.

The state reports include data for counties with 500 employees or more. These are the primary divisions of states, except in Louisiana where they are called parishes and in Alaska where they are called boroughs and census areas. Maryland, Missouri, Nevada, and Virginia have one or more places that are independent of county organizations. These places are treated as counties and places. The counties and places are defined as of January 1, 1997.

The state reports include data for places with 500 employees or more. Places are typically cities, towns, and villages. They may be incorporated municipalities, semiindependent municipalities, special economic urban areas (SEUAs), or other place equivalents.

The state reports also include data for consolidated cities with 500 employees or more. Consolidated cities are made up of separately incorporated municipalities.

COMPARABILITY OF THE 1992 AND 1997 CENSUSES

The adoption of the North American Industry Classification System (NAICS) has had a major impact on the comparability of data between the 1992 and 1997 censuses. Approximately half of the industries in the manufacturing sector of NAICS do not have comparable industries in the Standard Industrial Classification (SIC) system that was used in the past. If industries are not comparable between the two censuses, historic data are not shown. When applicable, Appendix G shows the product class and product comparability between the two systems.

While most of the change affecting the manufacturing sector was change within the sector, some industries left manufacturing and others came into manufacturing. Prominent among those leaving manufacturing are logging and portions of publishing. Prominent among the industries coming into the manufacturing sector are bakeries, candy stores where candy is made on the premises, custom tailors, makers of custom draperies, and tire retreading. Data for the industries coming into manufacturing as well as those leaving manufacturing are included in the manufacturing industry report series for 1997. However, the state and summary reports only include data for industries in the NAICS definition of manufacturing.

Another change resulting from the conversion to NAICS is that data for central administrative offices (CAOs) associated with manufacturing are not included along side the manufacturing data. This change affects data in the state reports and the general summary.

DISCLOSURE

In accordance with Federal law governing census reports (Title 13 of the United States Code), no data are published that would disclose the operations of an individual establishment or company. However, the number of establishments classified in a specific industry or geography is not considered a disclosure, and may be released even when other information is withheld.

The disclosure analysis for the industry statistics files 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 capital expenditures. However, the suppressed data are included in higher-level totals. A separate disclosure analysis is performed for capital expenditures that can be suppressed even though value of shipments data are published.

AVAILABILITY OF MORE FREQUENT ECONOMIC DATA

The Census Bureau conducts the Annual Survey of Manufactures (ASM) in each of the 4 years between the economic censuses. The ASM is a probability-based sample of approximately 58,000 establishments and collects many of the same industry statistics (including employment, payroll, value of shipments, etc.) as the economic census. However, there are selected statistics not included in the ASM. Among these are the number of companies and establishments, detailed product and materials data, and substate geographic data.

In addition to the ASM, the Census Bureau conducts a Current Industrial Reports (CIR) program. The CIR publishes detailed product statistics for selected manufacturing industries at the U.S. level annually and, in some cases, monthly and/or quarterly. For the 1997 Economic Census - Manufacturing, the annual CIR data are included in the Product Summary report.

The Census Bureau also conducts the monthly Manufacturers' Shipments, Inventories, and Orders (M3) program, which publishes detailed statistics for manufacturing industries at the U.S. level.

Table 1. Industry Statistics on NAICS Basis With Distribution Among 1987 SIC-Based Industries: 1997

[NAICS codes appear in bold type. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

NAICS		AI		All employees			oduction work	ers				Total capital
or SIC code	Industry	Com- panies ¹	estab- lish- ments ²	Number	Payroll (\$1,000)	Number	Hours (1,000)	Wages (\$1,000)	Value added by manufacture (\$1,000)	Cost of materials (\$1,000)	Value of shipments (\$1,000)	expendi- tures (\$1,000)
	Heating equipment (except warm air furnaces) mfg	442	469	24 666	756 974	16 139	32 015	377 173	2 071 102	1 656 292	3 716 661	89 652
343300 363410	Heating equipment, except electric	N	453	22 495	710 187	14 446	29 044	348 243	1 913 889	1 492 441	3 387 391	81 383
303410	(pt)	N	16	2 171	46 787	1 693	2 971	28 930	157 213	163 851	329 270	8 269

¹For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control. ²Includes establishments with payroll at any time during the year.

Table 2. Industry Statistics for Selected States: 1997

[States that are disclosures or with less than 100 employees are not shown. For explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

			All	All em	oloyees	Pr	Production workers					
Industry and geographic area	E¹	Total	With 20 em- ploy- ees or more	Number	Payroll (\$1,000)	Number	Hours (1,000)	Wages (\$1,000)	Value added by manufacture (\$1,000)	Cost of materials (\$1,000)	Value of shipments (\$1,000)	Total capital expendi- tures (\$1,000)
333414, HEATING EQUIPMENT (EXCEPT WARM AIR FURNACES) MFG												
United States	1	469	181	24 666	756 974	16 139	32 015	377 173	2 071 102	1 656 292	3 716 661	89 652
California Connecticut Florida Georgia Illinois	2 4 2 3	59 7 11 6 17	18 3 3 4 8	2 687 224 201 496 1 173	85 154 8 179 6 040 13 582 43 918	1 769 114 103 313 756	3 595 218 170 718 1 535	37 526 3 239 2 199 7 599 21 046	212 328 21 197 14 940 37 740 113 523	153 103 10 467 8 779 38 838 72 864	362 207 31 516 23 808 75 346 185 571	6 855 572 456 1 704 4 568
Indiana Kansas Massachusetts Michigan Minnesota	- 1 -	13 5 12 21 27	5 4 7 5 7	1 376 542 784 607 1 057	56 646 14 578 26 188 17 718 35 549	806 335 408 323 646	1 575 693 862 625 1 523	28 168 6 840 10 947 8 190 18 605	174 883 29 693 52 583 51 062 87 222	109 449 30 512 45 979 34 440 64 596	283 831 60 934 99 482 85 880 153 711	4 909 1 360 2 527 699 6 331
New York North Carolina Ohio Pennsylvania Rhode Island	- - 1 2	27 10 18 40 4	13 6 9 20 1	1 497 772 1 314 2 449 113	45 579 18 628 47 496 81 724 3 178	1 012 548 767 1 486 75	1 942 1 179 1 572 3 031 148	21 885 11 392 20 452 38 510 1 811	129 513 54 884 108 344 253 868 12 387	106 049 44 691 81 978 190 123 6 199	233 773 98 837 188 328 440 547 19 215	5 705 1 547 4 207 6 526 721
Tennessee Texas Washington Wisconsin	- 2 2 1	9 21 18 13	6 7 9 6	1 090 881 1 132 701	22 901 27 161 30 466 20 539	849 546 814 481	1 677 1 172 1 327 960	14 863 11 471 16 288 13 034	88 845 57 425 98 406 47 614	89 947 81 091 48 861 57 691	174 932 137 752 145 792 104 151	5 071 4 654 5 605 2 286

^{*} Hawaii has no incorporated places in the sense of functioning governmental units; however, in agreement with Hawaiian law, the Bureau of the Census reports data for census designated places (CDPs) which have been designated as place equivalents. Those CDPs, only for the state of Hawaii, with 2,500 or more population are recognized.

¹Some payroll and sales data for 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 statistics 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 where estimated data based on administrative-record data account for 10 percent or more of the figures shown: 1–10 to 19 percent; 2–20 to 29 percent; 3–30 to 39 percent; 4–40 to 49 percent; 5–50 to 59 percent; 6–60 to 69 percent; 7–70 to 79 percent; 8–80 to 89 percent; 9–90 percent or more.

Table 3. Detailed Statistics by Industry: 1997

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

ltem	Value	Item	Value
333414, HEATING EQUIPMENT (EXCEPT WARM AIR FURNACES) MFG		333414, HEATING EQUIPMENT (EXCEPT WARM AIR FURNACES) MFG—Con.	
Companies ¹ number	442	Value added	2 071 102
All establishments	469 288 107 74	Finished goods inventories, beginning of year \$1,000. Work-in-process inventories, beginning of year \$1,000.	531 773 201 942 101 477 228 354
All employees number. Total compensation ² \$1,000. Annual payroll. \$1,000. Total fringe benefits \$1,000.	24 666 938 677 756 974 181 703	Finished goods inventories, end of year \$1,000. Work-in-process inventories, end of year \$1,000. Materials and supplies inventories, end of year \$1,000.	573 571 205 889 108 263 259 419
Production workers, average for year	16 139 15 227 15 901	Gross book value of total assets at beginning of year \$1,000. Total capital expenditures (new and used) \$1,000. Capital expenditures for buildings and other structures	858 814 89 652
Production workers on August 12	16 730 16 698		20 421 69 231
Production-worker hours	32 015 377 173	Total retirements ²	18 545 929 921
Total cost of materials	1 656 292	Total depreciation during year ² \$1,000	61 406
Cost of materials, parts, containers, etc., consumed \$1,000.	1 502 234 1 502 234 97 555 11 814 21 476 23 213	Buildings and other structures rental payments ² \$1,000 Machinery and equipment rental payments ² \$1,000 Cost of purchased services for the repair of buildings and other	30 262 13 228 17 034
Quantity of electricity purchased for heat and power	343 937 -	structures ³ . \$1,000. Response coverage ratio ⁴ . percent. Cost of purchased services for the repair of machinery and	7 152 77
Total value of shipments\$1,000	3 716 661	equipment ³	16 502 77
Primary products value of shipments \$1,000 . Secondary products value of shipments \$1,000 . Total miscellaneous receipts \$1,000 .	3 349 479 203 765 163 417	Cost of purchased communications services ³ \$1,000. Response coverage ratio ⁴ percent. Cost of purchased legal services ³ \$1,000.	10 083 77 4 262
Value of resales \$1,000 Contract receipts \$1,000 Other miscellaneous receipts \$1,000	123 437 15 335 24 645	Response coverage ratio ⁴ percent. Cost of purchased accounting and bookkeeping services ³ \$1,000. Response coverage ratio ⁴ percent.	77 3 586 77
Primary products specialization ratio percent. Value of primary products shipments made in all industries\$1,000.		Cost of purchased software and other data processing	28 680 77
Value of primary products shipments made in this industry \$1,000 Value of primary products shipments made in other industries	3 349 479 255 619	Response coverage ratio ⁴ percent Cost of purchased refuse removal (including hazardous waste)	3 359 77
Coverage ratio percent	92	services ³ \$1,000 Response coverage ratio ⁴ percent	2 956 77

Note: The amounts shown for purchased services reflect only those services that establishments purchase from other companies.

¹For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

²These items are collected in the ASM and estimated for the remaining establishments; therefore, the levels of estimation are higher than for other items in the table.

³Based on ASM sample data.

⁴A response coverage ratio is derived for this item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight) for those ASM establishments that reported to the weighted total employment for all ASM establishments classified in this industry.

Table 4. Industry Statistics by Employment Size: 1997

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

			All shments	All em	oloyees	Pr	oduction work	ers				
Employment size class	E¹	Total	With 20 em- ploy- ees or more	Number	Payroll (\$1,000)	Number	Hours (1,000)	Wages (\$1,000)	Value added by manufacture (\$1,000)	Cost of materials (\$1,000)	Value of shipments (\$1,000)	Total capital expendi- tures (\$1,000)
333414, HEATING EQUIPMENT (EXCEPT WARM AIR FURNACES) MFG												
All establishments	1	469	181	24 666	756 974	16 139	32 015	377 173	2 071 102	1 656 292	3 716 661	89 652
Establishments with 1 to 4 employees	9	147	-	293	7 776	204	322	3 837	18 783	14 886	34 261	2 066
employees	7	76	-	529	14 829	343	553	7 069	48 123	36 814	85 770	1 330
employees	4	65	-	883	24 177	567	1 025	12 125	61 375	52 330	114 081	1 816
employees	1	57	57	1 833	56 937	1 177	2 292	25 882	154 201	124 631	274 602	6 595
employees	2	50	50	3 639	118 047	2 331	4 741	55 552	284 166	223 891	499 442	11 913
employees	1	50	50	8 116	250 195	5 244	10 565	121 076	658 600	533 513	1 192 065	27 988
employees	-	18	18	5 776	173 973	4 023	8 234	97 770	516 650	392 144	903 726	24 207
employees	-	6	6	3 597	111 040	2 250	4 283	53 862	329 204	278 083	612 714	13 737
employees Establishments with 2,500 employees	-	-	-	-	_	_	-	_	_	_	_	-
or more	-	_	-	_	_	_	-	_	_	=	_	_
Administrative records ²	9	209	-	909	22 691	603	906	11 121	55 208	43 386	100 337	2 385

¹Some payroll and sales data for 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 statistics 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 where estimated data based on administrative-record data account for 10 percent or more. 1-10 to 19 percent; 2-20 to 29 percent; 3-30 to 39 percent; 4-40 to 49 percent; 5-50 to 59 percent; 6-60 to 69 percent; 7-70 to 79 percent; 8-80 to 89 percent; 9-90 percent or more.

2 Some payroll and sales data for 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 statistics for these small establishments. Data are also included in respective size classes shown.

Table 5. Industry Statistics by Industry and Primary Product Class Specialization: 1997

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

		ror meaning or abbreviations and symbols, see introductory text. For explanation or terms, see appendixes]										
	All	All emp	oloyees	Pr	oduction work	ers	Value added			Total capital		
Industry or primary product class	estab- lish- ments	Number	Payroll (\$1,000)	Number	Hours (1,000)	Wages (\$1,000)	manufacture (\$1,000)	Cost of materials (\$1,000)	value of shipments (\$1,000)	expendi- tures (\$1,000)		
Heating equipment (except warm air furnaces) mfg	469	24 666	756 974	16 139	32 015	377 173	2 071 102	1 656 292	3 716 661	89 652		
Cast iron heating boilers, radiators,												
	15	2 056	79 667	1 250	2 524	39 261	240 674	213 202	450 224	8 243		
electric (excluding parts)	43	4 829	124 739	3 421	6 776	67 915	391 720	301 867	681 770	22 225		
	26	1 906	62 774	1 240	2 612	32 408	158 047	118 085	275 010	7 579		
Floor and wall furnaces, unit heaters,												
	29	3 029	90 285	1 957	3 960	46 633	254 495	204 253	458 598	7 225		
Other heating equipment, except electric (including parts for										. ==0		
oil burners)	97	10 366	325 616	6 606	13 164	155 541	851 042	673 148	1 521 076	34 765		
	warm air furnaces) mfg Cast iron heating boilers, radiators, and convectors, except parts Domestic heating stoves, except electric (excluding parts) Steel heating boilers (15 psi or less) and all hot water heating boilers (except electric), excluding parts Floor and wall furnaces, unit heaters, infrared heaters, and mechanical stokers (except electric) Other heating equipment, except electric (including parts for nonelectric heating equipment and	Industry or primary product class establishments Heating equipment (except warm air furnaces) mfg Cast iron heating boilers, radiators, and convectors, except parts	Industry or primary product class Stable St	Industry or primary product class establishments	Industry or primary product class establishments Payroll Payroll Number Payroll Payrol	Industry or primary product class establishments Payroll Payroll Hours Payroll Number Payroll Payroll	Industry or primary product class	All Payroll Payroll Hours Wages Manufacture Stablish Mumber Stablish	Industry or primary product class	Industry or primary product class		

Table 6a. Products Statistics: 1997 and 1992

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

introductory text.	For explanation of terms, see appendixes]			· ·		1000				
			19	997			19	992		
NAICS product code	Product	Number of companies with shipments of \$100,000	Quantity of production for all		shipments Value	Number of companies with shipments of \$100,000	Quantity of production for all		shipments Value	
333414	Heating equipment, except electric	or more	purposes	Quantity	(\$1,000) 3 605 098	or more	purposes	Quantity X	(\$1,000) N	
3334141	Cast iron heating boilers, radiators, and									
	convectors, except parts	N	Х	X	400 832	N	X	Х	331 023	
33341411	Cast iron boilers and radiators, and aluminum and other nonferrous metal radiators and convectors, incl. baseboard and finned tube type, residential, industrial, and special type		v		000 700		V	v		
3334141101	(excl. electric) Gas-fired cast iron boilers, excluding	N N	X	X	396 733	N 10	X	X	N	
3334141106	parts thousands Other cast iron boilers, excluding	9	X	90.7	97 504	10	X	133.6	145 039	
3334141111	electric and partsthousands Cast iron and steel radiators and	10	Х	87.1	99 477	9	X	105.9	132 055	
3334141116	convectors, excluding partsthousands Aluminum and other nonferrous metal radiators and convectors, including baseboard and finned tube type, residential, industrial, and special type (excluding electric and parts)thousands	5	×	P12 417.6	157 226 42 526	7	x	x s	12 194 41 713	
3334141Y	Cast iron heating boilers, radiators, and									
3334141YWV	convectors, except parts, nsk Cast iron heating boilers, radiators, and convectors, except parts, nsk	N N	×	X X	4 099 4 099	N N	x x	X X	N Z	
3334143	Domestic heating stoves, except electric	N N	X	x		N		X	326 055	
33341431	(excluding parts)	N	X	×	562 656	N	x x	X	320 033 N	
3334143101	Heating stoves				540 662					
3334143106	stoves (excluding parts)	18	Х	P162.0	81 024	N	X	Х	N	
3334143111	parts)	8	Х	385.3	14 387	N	X	Х	N	
3334143116	(excluding parts)	12	Х	1 256.5	51 800	N	X	Х	N	
3334143121	heaters (excluding parts)	3	X	D	D	N	X	X	N	
0004440400	fireplaces thousands	3	X	D	D	N N	X	X	N	
3334143126 3334143131	Domestic wood fireplace insertsthousands Coal, kerosene, gasoline, and fuel oil domestic heating stoves (excluding parts)thousands	5	x x	D 922.7	6 063	N 9	×	X 180.4	N 35 571	
3334143136	Freestanding wood fireplaces and domestic heating stoves (all types), including circulating and radiants									
3334143141	(excluding parts) thousands Wood pellet fuel-burning domestic	19	X	P166.3	74 567	21	X	9348.0	112 974	
3334143146	heaters (excluding parts)	8	Х	P54.5	53 023	13	X	37.5	37 770	
3334143151	fireplaces thousands. Domestic wood fireplace inserts thousands.	5 11	X	96.0	36 969	10 14	×	924.9	44 797 14 144	
3334143Y	Domestic heating stoves, except electric		V	V	01 004	N.	V	V	N	
3334143YWV	(excluding parts), nsk Domestic heating stoves, except electric (excluding parts), nsk	N N	X X	X X	21 994 21 994	N N	x x	X X	N 15 903	
3334145	Steel heating boilers (15 psi or less) and all hot water heating boilers (except electric), excluding parts	N	X	x	219 582	N	x	x	126 177	
33341451	•	N	X	x	205 563	N N	x	X	120 177 N	
3334145101	Steel heating boilers (15 p.s.i. or less), steel heating boilers (15 p.s.i. or less), and all hot water heating boilers (except electric), excluding parts,	IN IN	^	^	203 363	IN IN	^	^	IN	
3334145111	400,000 Btu per hour or less. Steel heating boilers (15 p.s.i. or less), and all hot water heating boilers (except electric), excluding parts, 400,001 Btu per hour or more, including scotch type and horizontal	19	X	X 24.8	98 940	19	×	S 7.4	71 915	
00044.451/	fire box thousands	13	Х	24.8	106 623	8	X	7.4	47 820	
3334145Y	Steel heating boilers (15 p.s.i. or less), and all hot water heating boilers, excluding parts, nsk	N	Х	х	14 019	N	x	х	N	
3334145YWV	Steel heating boilers (15 p.s.i. or less), and all hot water heating boilers, excluding parts, nsk	_N	Х	x	14 019	N N	x	x	6 442	

See footnotes at end of table.

Table 6a. Products Statistics: 1997 and 1992—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 meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

			19	97			19	192	
NAICS		Number of companies		Product	shipments	Number of companies		Product	shipments
product code	Product	with shipments of \$100,000 or more	Quantity of production for all purposes	Quantity	Value (\$1,000)	with shipments of \$100,000 or more	Quantity of production for all purposes	Quantity	Value (\$1,000)
333414	Heating equipment, except electric—Con.				(, ,			,	, , , , , , , , , , , , , , , , , , ,
3334147	Floor and wall furnaces, unit heaters, infrared heaters, and mechanical stokers (except electric)	N	х	X	531 244	N	x	х	358 952
33341471	Floor and wall furnaces, unit heaters, gas- fired infrared heaters, and mechanical			v	=10.0=1			v	
3334147101 3334147106	stokers, including parts Floor and wall furnaces (gas and oil) Gas-fired unit heaters, 400,000 Btu per	N 13	X	X	510 354 99 321	N 13	X	X	130 863
3334147111	hour or less Steam or hot water heating element, centrifugal fan-type (blower) and propeller fan-type unit heaters (except	13	Х	Х	197 622	10	X	Х	93 532
3334147116 3334147121 3334147126	electric) Gas-fired infrared heaters thousands Mechanical stokers (except electric) Parts for floor and wall furnaces, unit heaters, qas-fired infrared heaters.	5 15 4	X X	429.5 X	87 500 D	7 19 6	X X X	P338.6 X	23 888 54 397 7 547
2004447V	and mechanical stokers	16	Х	Х	95 706	16	x	Х	32 267
3334147Y 3334147YWV	Floor and wall furnaces, unit heaters, infrared heaters, and mechanical stokers, nsk	N	Х	x	20 890	N	x	x	N
	infrared heaters, and mechanical stokers, nsk	N	х	х	20 890	N	x	х	16 458
3334149	Other heating equipment, except electric (including parts for nonelectric heating equipment and oil burners) @	N	х	х	1 571 443	N	x	х	N
33341491	Other heating equipment, except electric (including parts for nonelectric heating equipment and oil burners)	N	v	v	1 273 050	N	_	v	
3334149101 3334149106 3334149111	Oil burners Parts and attachments for oil burners Gas burners and gas conversion burners (including parts), 400,000 Btu	25 9	X X X	X X X	163 537 29 900	N 18	X X X	X X X	43 351
3334149116	per hour or less	16	Х	S	107 255	18	X	S	67 983
3334149121	per hour or more	21 14	X X	X X	90 645 48 033	22 20	X X	X X	126 940 26 015
3334149126	Heating unit ventilators (except electric)	4	Х	х	D	5	x	х	71 711
3334149131	Nonelectric prefabricated metal fireplaces for commercial and industrial use	4	×	S	35 079	6	x	S	51 985
3334149136 3334149140	Solar energy collectors (water or air). Wall and baseboard heating units for permanent installation	7 11	X	x x	17 626 227 959	9 N	x x	X X	35 295 N
3334149150 3334149151	Parts, accessories, and attachments for wall and baseboard heating units. Other heating equip. incl dual-fired gas and oil burners, heat transfer (blast) coils, range boilers, expansion tanks, direct fired water heater the	5	Х	х	D	N	x	х	N
	direct-fired water heater tanks, other parts for heating equip. except electric.	69	х	x	471 730	N	x	х	Ν
3334149Y	Other heating equipment except electric (including parts for nonelectric heating equipment and oil burners), nsk	N	x	x	298 393	N	x	x	N
3334149YWV	equipment and oil burners), risk. Other heating equipment, except electric (including parts for nonelectric heating equipment and oil burners), nsk.	N	×	X	298 393	N	×	x	N
333414W	Heating equipment, except electric, nsk, total	N	х	х	319 341	N	x	x	N
333414WY	Heating equipment, except electric, nsk, total .	N	×	х	319 341	N	x	x	N
333414WYWW	Heating equipment, except electric, nsk, for nonadministrative-record establishments.	"	X	x	215 505	N	x	×	,
333414WYWY	Heating equipment, except electric, nsk, for administrative-record establishments.	"	X	x	103 836	N	x	×	,

Note: For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: p 10 to 19 percent estimated; q 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by S.

[#] Additional information is available for this item; see Appendix F.

@ Additional data are available for these codes at the aggregate U.S. level in the Current Industrial Report (CIR) series; see Appendix F for the CIR survey number and title.

\$ This product is primary to more than one industry; see Appendix F for a listing of the related product codes.

Table 6b. Product Class Shipments for Selected States: 1997 and 1992

[Product classes covered are those that are economically significant and whose production is 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 1997. For meaning of abbreviations and symbols, see introductory text. For explanations of terms, see appendixes]

NAICS product class	Product class and geographic area	Value of product shipments (\$1,000)				
code		1997	1992			
3334141	CAST IRON HEATING BOILERS, RADIATORS, AND CONVECTORS, EXCEPT PARTS					
	United States	400 832	331 023			
3334143	DOMESTIC HEATING STOVES, EXCEPT ELECTRIC (EXCLUDING PARTS)					
	United States	562 656	326 055			
	California	59 617	28 490			
	Illinois North Carolina	13 758 20 803	N 20 068			
	Tennessee	140 153	N			
	Washington	89 634	51 894			
3334145	STEEL HEATING BOILERS (15 PSI OR LESS) AND ALL HOT WATER HEATING BOILERS (EXCEPT ELECTRIC), EXCLUDING PARTS					
	United States	219 582	126 177			
	California	60 098	25 942			
	Pennsylvania	50 847	34 845			
3334147	FLOOR AND WALL FURNACES, UNIT HEATERS, INFRARED HEATERS, AND MECHANICAL STOKERS (EXCEPT ELECTRIC)					
	United States	531 244	358 952			
	Michigan	70 109	46 407			
	Ohio	10 805	N			
3334149	OTHER HEATING EQUIPMENT, EXCEPT ELECTRIC (INCLUDING PARTS FOR NONELECTRIC HEATING EQUIPMENT AND OIL BURNERS) @					
	United States	1 571 443	N			
	Alabama	20 891	N			
	California	129 099 20 030	N N			
	Illinois	114 607	N N			
	Indiana	44 848	N			
	Kansas	94 229	N			
	Massachusetts	74 195 2 167	N N			
	Minnesota	29 424	N			
	New Jersey	31 200	N			
	New York Ohio	104 714 161 170	N N			
	Oklahoma	27 953	N			
	Pennsylvania	123 237 41 082	N N			
	Washington	37 325	N			
	Wisconsin	78 292	N			

Table 7. Materials Consumed by Kind: 1997 and 1992

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

NAICS		19	97	19	92
material code	Material consumed	Quantity	Delivered cost (\$1,000)	Quantity	Delivered cost (\$1,000)
333414	HEATING EQUIPMENT (EXCEPT WARM AIR FURNACES) MFG				
33272203 33200037 33210001 33151001 33152011	Metal bolts, nuts, screws, washers, rivets, and other screw machine products Other fabricated metal products (except forgings) Forgings Iron and steel castings (rough and semifinished) Nonferrous (aluminum, copper, etc.) castings (rough and semifinished)	X X X X	20 220 245 850 9 956 73 431 30 321	x x x x	N N N N
33120007 33120017 33120091 33100039 33100083	Steel bars, bar shapes, and plates (except castings, forgings, and fabricated metal products)	Х	23 325 161 760 21 501 12 618 34 535	x x x	N N N N N N N N N N N N N N N N N N N
33531201 33451200 32221001 00970099 00971000	Electric motors and generators Automatic temperature controls (thermostats, regulators, etc.) Paperboard containers, boxes, and corrugated paperboard All other materials and components, parts, containers, and supplies Materials, ingredients, containers, and supplies, n.s.k.	X X X X X	58 055 115 062 42 994 387 499 265 107	× × × × ×	N N N N N

[#] Additional information is available for this item; see Appendix F.

Note: For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: p 10 to 19 percent estimated; q 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by S.

[#] Additional information is available for this item; see Appendix F.

@ Additional data are available for these codes at the aggregate U.S. level in the Current Industrial Report (CIR) series; see Appendix F for the CIR survey number and title.

\$ This product is primary to more than one industry; see Appendix F for a listing of the related product codes.

Appendix A. Explanation of Terms

BEGINNING- AND END-OF-YEAR INVENTORIES

Respondents were asked to report their beginning-of-year and 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). Beginning 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.

Inventory Data by Stage of Fabrication

Total inventories and three detailed components (1) finished goods, (2) work-in-process, and (3) materials, supplies, fuels, etc., were collected.

When using inventory data by stage of fabrication for "all industries" and at the three-digit subsector 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 an 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 all publication levels.

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.

Included in this item are:

- Cost of parts, components, containers, etc.—Includes 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.
- Cost of products bought and sold in the same condition.

- Cost of fuels consumed for heat and power—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.
- 4. Cost of purchased electricity—The cost of purchased electric energy represents the amount actually used during the year for heat and power. In addition, information was 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.
- 5. Cost of contract work—This term applies to work done by others on materials furnished by the manufacturing establishment. The actual cost of the material is to be reported on the cost of materials, parts, and containers line of this item. The term "Contract Work" refers to the fee a company pays to another company to perform a service.

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. If less than \$25,000 of a listed material was consumed by an establishment, the cost data could be reported in the "Cost of all other materials...," Census material code 00970099. Also, the cost of materials for small establishments for which administrative records or short forms were used was imputed into the "Materials not specified by kind," Census materials code 00971000.

Duplication in Cost of Materials and Value of Shipment

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

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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 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.

COST OF PURCHASED SERVICES

Annual Survey of Manufactures (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 reflects the costs paid directly by the establishment and excludes 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. 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 was capitalized is considered capital expenditures and is, 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.

Response Coverage Ratio

A response coverage ratio is a measure of the extent to which respondents report for an item. The estimate is made by calculating the ratio value of the weighted total employment data for all the ASM establishments that report the item to the weighted total employment data for all ASM establishments classified in an industry (reporters and non-reporters).

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.

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 truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office functions, 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 utilized as a separate work force.

FRINGE BENEFITS

Fringe benefits 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 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 companyoperated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS AT BEGINNING OF YEAR (BOY) AND END OF YEAR (EOY)

Total value of depreciable assets is collected on all census forms. It shows the value of depreciable assets for the beginning of year and end of year. The data encompass all fixed depreciable assets on the books of establishments. 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 capital expenditures, less retirements, equaled assets at the end of the year.

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.

PAYROLL

This item includes the gross earnings of all employees on the payrolls of operating manufacturing establishments paid in the calendar year. 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' total supplemental labor costs (those required by Federal and state laws and those incurred voluntarily or as part of collective bargaining agreements).

PRODUCT CODES AND CLASSES OF PRODUCTS

NAICS United States industries are identified by a six-digit code, in contrast to the four-digit SIC code. The longer code accommodates the large number of sectors and allows more flexibility in designing subsectors. Each

product or service is assigned a ten-digit code. The product coding structure represents an extension by the Census Bureau of the six-digit industry classifications of the manufacturing and mining sectors. The classification system operates so that the industrial coverage is progressively narrower with the successive addition of digits. This is illustrated as follows:

NAICS level	NAICS code	Description
Industry	33461	Manufacturing and reproduction of magnetic and optical media
U.S. industry	334612	Reproduction of software
Product class	3346120	Prerecorded compact disc (except software), tape, and record reproducing
BLS link code	3346120X	_
Product code	3346120XXX	

As in previous censuses, data were collected for most industries on the quantity and value of individual products shipped. In the 1997 census program, information was collected on the output of almost 10,000 individual product items.

In the new system, there are about 1,500 product classes (seven-digit codes), about 6,000 census products (ten-digit codes), and an additional 3,700 CIR products (ten-digit codes). The ten-digit products are considered the primary products of the industry with the same first six digits.

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 1992 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 (quantity produced and consumed) 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.

PRIMARY PRODUCT CLASS CODE

This file presents selected statistics for establishments according to their degree of specialization in products primary to their industry. This field contains either the six-digit North American Industrial Classification System (NAICS) industry code corresponding to all establishments in the industry, or the seven-digit NAICS product class code for all establishments within the industry that are specialized in a particular product class. Product class specialization is determined by evaluating the ratio of the largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment.

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.

QUANTITY OF ELECTRIC ENERGY CONSUMED FOR HEAT AND POWER

Data on the cost of purchased electric energy were collected on all census forms. However, data on the quantity of purchased electric energy were collected only on the Annual Survey of Manufactures (ASM) form. 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.

RENTAL PAYMENTS

Total rental payments are 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 companyowned 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.

RETIREMENTS OF DEPRECIABLE ASSETS

Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during the calendar year. 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.

TOTAL CAPITAL EXPENDITURES (NEW AND USED)

For establishments in operation and any known plants under construction, manufacturers were asked to report their new and used 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.

Totals for expenditures include the costs of assets 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 land and cost of maintenance and repairs charged as current operating expenses.

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. If an establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported.

VALUE ADDED

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, 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.

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 sold without further processing. Included are all items made by or for the establishments from material 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.

In addition to the value for NAICS defined products, aggregates of the following categories of miscellaneous receipts are reported as part of a total establishment's value of product shipments:

- 1. Reported contract work—Receipts for work or services that a plant performed for others on their materials.
- 2. Value of resales—Sales of products brought and sold without further manufacture, processing, or assembly.
- 3. Other miscellaneous receipts—Such as repair work, installation, sales of scrap, etc.

Industry primary product value of shipments represents one of the three components of value of shipments. These components are:

- 1. Primary products value of shipments.
- 2. Secondary product value of shipments.
- 3. Total miscellaneous receipts.

Primary product shipments is used in the calculations of industry specialization ratio and industry coverage ratio. The term "Value of primary products shipments made in this industry" is used in this publication and refers to the same data.

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Duplication in Cost of Materials and Value of Shipment

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.

Specialization and Coverage Ratios

These items are not collected on the report forms but are derived from the data shown in Table 3. 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 5 and data on product shipments shown in Tables 6a and 6b.

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.

Appendix B. NAICS Codes, Titles, and Descriptions

333414 HEATING EQUIPMENT (EXCEPT WARM AIR FURNACES) MANUFACTURING

This U.S. industry comprises establishments primarily engaged in manufacturing heating equipment (except electric and warm air furnaces), such as heating boilers, heating stoves, floor and wall furnaces, and wall and baseboard heating units.

The data published with NAICS code 333414 include the following SIC industries:

3433 Heating equipment, except electric 3634 Electric housewares and fans (pt)

This definition comes from the 1997 NAICS Manual. However, for this industry, the 1997 Economic Census – Manufacturing did not fully implement the conversion to NAICS. Data for NAICS industry 333414 do not include establishments primarily engaged in the manufacture of cooling towers of wood, metal, or sheet metal, or the manufacture of electric swimming pool heaters. The NAICS definitions will be fully implemented with the 2002 Economic Census.

Appendix C. Coverage and Methodology

MAIL/NONMAIL UNIVERSE

The manufacturing universe includes about 400,000 establishments. This number includes those industries in the North American Industry Classification System (NAICS) definition of manufacturing, but not those industries leaving the manufacturing sector in the classification change. 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 (ASM). 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:

 Small single-establishment companies not sent a report form.

Approximately 40 percent of the manufacturing establishments were small single-establishment companies that were excused from filing a census report. Selection of these establishments was based on two factors: annual payroll and our ability to assign the correct six-digit NAICS industry classification to the establishment. For each four-digit Standard Industrial Classification (SIC) industry code, an annual payroll cutoff was determined. These cutoffs were derived so that the establishments with payroll less than the cutoff were expected to account for no more than 3 percent of the value of shipments for the industry. Generally, all single-establishment companies with less than 5 employees were excused, while all establishments with more than 20 employees were mailed forms. Establishments below the cutoff that could not be directly assigned a six-digit NAICS code were mailed a classification report which requested information for assigning NAICS industry codes. Establishments below the cutoff that could be directly assigned a six-digit NAICS code were excused from filing any report. For below cutoff establishments, information on the physical location, payroll, and receipts was obtained from the administrative records of other Federal agencies under special arrangements that 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" (nsk) categories.

The industry classification codes included in the administrative-record 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 to a four-digit SIC industry and then erroneously re-coded to a six-digit NAICS industry. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes the administrative-record cases had only two- or three-digit SIC group classification codes available in the files. For the 1997 Economic Census – Manufacturing, 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 appropriate six-digit NAICS level. Establishments that did not return the classification form were coded later to those six-digit NAICS industries identified as "All other" industries within the given subsector.

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 establishments covered in the mail canvass were divided into three groups:

a. ASM sample establishments.

This group accounts for approximately 15 percent of all manufacturing establishments. The ASM panel covers 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. For more information, see the Description of the ASM Survey Sample.

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In an economic census 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 additional information on gross book value of assets and capital expenditures. ASM establishments were also requested to provide information on retirements, depreciation, rental payments, and supplemental labor costs. For establishments not included in the ASM, these additional items were estimated using relationships observed in the ASM establishment data. The census statistics for these variables are a sum of the ASM establishment data and the estimated data for non-ASM establishments. ASM establishments were also requested to provide information for selected purchased services. The census statistics for the purchased service items were derived solely from the ASM establishments. See Appendix A, Explanation of Terms for an explanation of these items. The census part of the report form is 1 of 220 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of this many forms to canvass the 480 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 perform. Respondents were requested to identify the products, the value of each product, and, in many 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 materials not identified on the form.

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 30 percent of all manufacturing establishments were included in this group. A variable cutoff, based on administrative-record payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive 1 of the 220 economic census – manufacturing 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 includes approximately 15 percent of all manufacturing establishments. For those industries where application of the variable cutoff for administrative-record 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 31 versions of the short form, which requested summary product and material data and totals but no details on employment, payroll, cost of materials, inventories, and capital expenditures.

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

INDUSTRY CLASSIFICATION OF ESTABLISHMENTS

Each of the establishments covered in the 1997 Economic Census – Manufacturing was classified in 1 of 480 industries (473 manufacturing industries and 7 former manufacturing industries) in accordance with the industry definitions in the 1997 NAICS Manual. This is the first edition of the NAICS Manual and it is a major change from the 1987 SIC Manual that was used previously. Appendix A of the 1997 NAICS Manual notes the comparability between the 1987 SIC and 1997 NAICS classification systems. When applicable, Appendix G of this report shows the product class and product comparability between the two systems for data in this report.

In the NAICS system, an industry is generally defined as a group of establishments that have similar production processes. To the extent practical, the system uses supply-based or production-oriented concepts in defining industries. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees.

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The coding system works in such a way that the definitions progressively become narrower with successive additions of numerical digits. In the manufacturing sector for 1997, there are 21 subsectors (three-digit NAICS), 86 industry groups (four-digit NAICS), 184 NAICS industries (five-digit NAICS) that are comparable with Canadian and Mexican classification, and 473 U.S. industries (six-digit NAICS). This represents an expansion of the four-digit SICbased U.S. industries from 459 in 1987. Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. In the new system, there are about 1,500 product classes (seven-digit codes), about 6,000 census products, and an additional 3,700 CIR products (ten-digit codes). The ten-digit products are considered the primary products of the industry with the same first six digits. These counts do not include the seven former manufacturing industries that are included in the 1997 Economic Census - Manufacturing.

For the 1997 Economic Census – Manufacturing, all establishments were classified in particular industries based on the products they produced. If an establishment made products of more than one industry, it was classified in the industry with the largest product value. For 1997, there were no "resistance rules" or "frozen industries."

In ASM years, establishments included in the ASM sample with certainty weights 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. 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 some industries comprise different mixes of establishments in different survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the six-digit NAICS 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-record 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.

Establishments frequently make products classified both in their industry (primary products) and other industries (secondary products). Industry statistics (employment, payroll, value added by manufacture, value of shipments, etc.) reflect the activities of the establishments which may make both primary and secondary products. Product statistics, however, represent the output of all establishments without regard for the classification of the producing establishment. For this reason, when relating the industry statistics, especially the value of shipments, to the product statistics, the composition of the industry's output should be considered.

The extent to which industry and product statistics may be matched with each other is measured by the primary product specialization ratio and the coverage ratio. The primary product specialization ratio is the proportion of industry shipments accounted for by the primary products of establishments classified in the industry. The coverage ratio is the proportion of product shipments accounted for by establishments classified in the industry.

ESTABLISHMENT BASIS OF REPORTING

The economic census – manufacturing is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location or establishment. 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 1997, 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.

The 1997 Economic Census – Manufacturing excludes data for central administrative offices (CAOs). These would include separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company. These data are published in a separate report series.

DESCRIPTION OF THE ASM SURVEY SAMPLE

The annual survey of manufactures (ASM) sample is drawn for the second survey year after a census. The most recent sample was drawn for the 1994 survey year based on the 1992 Census of Manufactures. This sample will be in place through the 1998 ASM.

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In 1992, there were approximately 370,000 individual manufacturing establishments. For sample efficiency and cost considerations, the 1992 manufacturing population was partitioned into two components for developing estimates within the ASM; a mail stratum and a nonmail stratum.

Mail stratum. The mail stratum of the survey is comprised of larger single-location manufacturing companies and all manufacturing establishments of multiunit companies (companies that operate at more than one physical location). Approximately 230,000 of the 370,000 establishments in the 1992 census were assigned to the mail stratum. On an annual basis, the mail stratum is supplemented with larger, newly active single-location companies identified from a list provided by the Internal Revenue Service (IRS) and new manufacturing locations of multiunit companies identified from the Census Bureau's Company Organization Survey (COS).

For the 1994 survey, a new sample of approximately 58,000 individual establishments was selected from the mail stratum assembled from the 1992 census. Supplemental samples representing both 1993 and 1994 births (newly active establishments that were not included in the 1992 census) were also selected. Establishments selected for the sample are mailed an ASM survey questionnaire for each year through 1998.

The 1994-98 ASM sample design is similar to the one used since 1984. Companies in the 1992 Census of Manufactures with manufacturing shipments of at least \$500 million were defined as company certainties. For these large companies, each manufacturing establishment is included in the mail sample. For the 1994-98 sample, there are approximately 650 certainty companies collectively accounting for over 18,000 establishments.

For the remaining portion of the mail component of the survey, the establishment was defined as the sample unit. All establishments with 250 employees or more were defined as employment certainties. In addition, all establishments producing products in SIC 3571 (Electronic Computers) were defined as certainties. Across these three arbitrary certainty classes, there were approximately 25,000 establishments included in the sample with certainty. Collectively, these certainty establishments accounted for approximately 80 percent of the total value of shipments in the 1992 Census of Manufactures.

Smaller establishments in the remaining portion of the mail stratum were sampled with probabilities ranging from .02 to 1.00. The initial probabilities of selection assigned to these establishments were proportionate to a measure-of-size determined for each establishment. The measure-of-size was a function of the establishment's 1992 industry classification, its 1992 product class data, and the historical variability of the year-to-year estimates of the product class estimates. For each product class (1,755) and four-digit industry (459), a desired reliability

constraint was specified. Using a technique developed by Dr. James R. Chromy of the Research Triangle Institute, the initial establishment probabilities were optimized such that the expected sample satisfied all industry and product class reliability constraints while the sample size was minimized. This technique reduces the likelihood of selecting nonrepresentative samples for individual product classes or industries.

This method of assigning probabilities based on product class shipments is motivated by our primary desire to produce reliable estimates of both product class and industry shipments. The high correlation between shipments and employment, value-added, and other general statistics assures that these variables will also be well represented by the sample. The actual sample selection procedure uses an independent chance of selection method (Poisson sampling) which permits us to prevent small establishments from being selected in consecutive samples without introducing a bias into the survey estimates.

Nonmail component. The initial nonmail component of the survey was comprised of approximately 140,000 small, single-establishment companies that were tabulated as administrative records in the 1992 Census of Manufactures. The nonmail stratum is also supplemented annually using the list of newly active single-location companies provided by the Internal Revenue Service (IRS) and payroll cutoffs. Companies with payroll below the payroll cutoff are added to the nonmail stratum. For this portion of the population, sampling is not used. The data for this group are estimated based on selected information obtained annually from the administrative records of the IRS and Social Security Administration (SSA). This administrative information, which includes payroll, total employment, industry classification, and physical location, is obtained under conditions which safeguard the confidentiality of both tax and census records.

DESCRIPTION OF THE ASM ESTIMATING PROCEDURE

Most of the ASM estimates derived for the mail stratum are computed using a difference estimator. At the establishment level, there is a strong correlation between the current-year data values and the corresponding 1992 (base) data values. Therefore, within the mailed stratum, for each item at each level of aggregation, an estimate of the "difference" between the current year and the base year is computed from sample cases and added to the corresponding base-year values. For the 1993-1997 ASM estimates, the 1992 Census of Manufactures values serve as the base year. For the 1998 ASM, the base will be updated to be the 1997 Economic Census – Manufacturing.

Due to the positive year-to-year correlation, estimates derived using this methodology are generally more reliable than comparable estimates developed from the current sample data alone. Estimates for the capital expenditures variables are not generated using the difference

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estimator because the year-to-year correlations are considerably weaker. The standard linear estimator is used for these variables.

For the nonmail stratum, estimates for payroll and employment are directly tabulated from the administrative-record data provided by IRS and SSA. Estimates of data other than payroll and employment are developed from industry averages. Although the nonmail stratum contains approximately 170,000 individual establishments in 1994, it accounts for less than 2 percent of the estimate for total value of shipments at the total manufacturing level.

Corresponding estimates for the mail and nonmail components are combined to produce the estimates included in this publication.

QUALIFICATIONS OF THE ASM DATA

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

The particular sample selected for the ASM is one of many 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 theoretically comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected ASM statistics in this report. They are represented 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, completecoverage value for specified percentages of all the possible samples).

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

From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.

From two standard errors below to two standard errors above the derived estimate for about 19 out of 20 of all possible samples.

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 at 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 during 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 moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown. Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be combined with higher level totals, creating a broader aggregate, which then may be of acceptable reliability.

DATA FROM THE CURRENT INDUSTRIAL REPORTS (CIR)

The CIR program provides product statistics for selected manufacturing industries at the U.S. level annually and, in some cases, monthly and/or quarterly. When detail product data are collected in the CIR, they are not also collected in the census. However, the annual CIR data are included in the census Product Summary report.

The CIR program uses a unified data collection, processing, and publication system. The Census Bureau updates the survey panels for most reports annually and reconciles the estimates to the results of the broader-based annual survey of manufactures and the economic

census – manufacturing. The economic census – manufacturing provides a complete list of all producers of the products covered by the CIR program and serves as the primary source for CIR sampling. Where a small number of producers exist, CIR surveys cover all known producers of a product. However, when the number of producers is large, cutoff and random sampling techniques are used. Surveys are continually reviewed and modified to provide the most up-to-date information on products produced. While the CIR program includes both mandatory and voluntary surveys, the annual data are mandatory.

DUPLICATION IN COST OF MATERIALS AND VALUE OF SHIPMENTS

Data for cost of materials and value of shipments include varying amounts of duplication, especially at higher levels of aggregation. This is because the products of one establishment may be the materials of another. The value added statistics avoid this duplication and are, for most purposes, the best measure for comparing the relative economic importance of industries and geographic areas.

VALUE OF INDUSTRY SHIPMENTS COMPARED WITH VALUE OF PRODUCT SHIPMENTS

The 1997 Economic Census – Manufacturing shows value of shipments data for industries and products. In the industry statistics tables and files, 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 the products statistics tables and files represent the total value of all products shipped that are classified as primary to an industry regardless of the classification of the producing establishment.

C-6 APPENDIX C MANUFACTURING

Appendix D. Geographic Notes

Not applicable for this report.

1997 ECONOMIC CENSUS APPENDIX D D-1

Appendix E. Metropolitan Areas

Not applicable for this report.

1997 ECONOMIC CENSUS APPENDIX E E-1

Appendix F. Footnotes for Products Statistics and Materials Consumed by Kind

Part 1. Products Statistics (Tables 6a and 6b)

NAICS product code	Footnote
@3334149	For additional detail, see Current Industrial Report MA335E, Electric Housewares and Fans.

Part 2. Materials Consumed by Kind (Table 7)

Not applicable.

Appendix G. Comparability of Product Classes and Product Codes: 1997 to 1992

1997 published	1997 collected	1992 published	1997 published	1997 collected	1992 published	1997 published	1997 collected	1992 published
3331111 3331111000	35231 3523100	35231 3523100	3331209 3331209111 3331209245	35319	3531M pt 3531M03 3531M01	333132W	35330 3533000 3533002	35330 3533000 3533002
3331113 3331113000	35232 pt 3523200 pt	35232 pt 3523200 pt	3331209352 3331209353 3331209366 pt	3531920 3531930 3531960 pt	3531M05 3531M07 pt 3531M07 pt	3332103 3332103101	35533 3553311	35533 3553311
3331117 3331117000	35233 3523300	35233 3523300	3331209366 pt 3331209377	3531960 pt	3531M21 pt 3531M08 pt	3332103106 3332103111 3332103116	3553313 3553314 3553316	3553313 3553315 pt 3553315 pt
3331119 3331119000	35235 3523500	35235 3523500	3331209388 3331209YWV	3531980 3531900	3531M21 pt 3531M00 pt	3332103121	3553317 3553318	3553315 pt 3553315 pt
333111A 333111A000	35236 3523600	35236 3523600	333120W	35310 pt 3531000 pt 3531002 pt	35310 pt 3531000 pt 3531002 pt	3332103231 3332103236 3332103241	3553319 3553321 3553323	3553319 3553321 3553323
333111C 333111C110	35239 3523926	35239 3523926	3331311 3331311000	35325 3532500	35325 3532500	3332103246	3553325 3553327	3553325 3553327
333111C220 pt	3523931 3523953 3523900	3523931 3523953 3523900	3331313 3331313100		35326 3532600	3332103256 3332103261 3332103266	3553329 3553333 3553334	3553329 3553333 3553334
333111E 333111E000	3523C	3523C 3523C00	3331315 3331315000		35327 3532700	3332103271 3332103276 3332103279	3553335 3553337 3553339	3553335 3553337 3553338 pt
333111G 333111G000 pt	3523E pt 3523E00 pt	3523E pt 3523E00 pt	3331317 3331317000	35328 3532800	35328 3532800	3332103283 3332103287 3332103291	3553341 3553343 3553349	3553338 pt 3553338 pt 3553338 pt
333111G000 pt	3523E89	3523E00 pt	3331319 3331319101 3331319106	3532923	35329 3532931 pt 3532935	3332103291 3332103396 3332103YWV	3553387 3553300	3553387 3553300
333111J000	3523F00	3523F00	3331319111 3331319216	3532927 3532929	3532942 3532931 pt	3332105 3332105101 3332105211	35534 3553411 3553412	35534 3553411 3553412
333111WYWW 333111WYWY	3523000 pt 3523002 pt	3523000 pt	3331319321 3331319426 3331319531	3532961 3532963 3532965	3532972 pt 3532972 pt 3532972 pt	3332105221 3332105231	3553415 3553417	3553413 pt 3553413 pt
3331121 3331121000 pt 3331121000 pt	35241 pt 3524100 pt 3524109	3524100 pt	3331319636 3331319744 3331319YWV	3532967 3532969 3532900	3532972 pt 3532972 pt 3532900	3332105241 3332105251 3332105YWV	3553419 3553421 3553400	3553413 pt 3553413 pt 3553400
3331123 3331123000	35244 3524400	35244	333131W	35320	35320 3532000 3532002	333210W	35530 3553000 3553002	35530 3553000 3553002
3331127 3331127000	35246	35246	3331321 3331321101 pt	35337 3533710 pt	35337 3533711	3332201 3332201106 3332201111	35593 3559303 3559305	35593 3559303 3559305
333112W	35240 pt 3524000 pt 3524002 pt	35240 pt 3524000 pt	3331321101 pt 3331321101 pt 3331321106 3331321111	3533710 pt	3533712 3533714 3533715 3533716	3332201116 3332201121 3332201201 3332201226	3559307 3559309 3559301 3559311	3559307 3559309 3559301 3559311
3331201 pt	35315 pt	3531A	3331321116 3331321122 3331321126	3533717	3533717 3533721 3533722	3332201231 3332201236 3332201341	3559313	3559313 3559315
•	35315 pt		3331321131 3331321136 pt	3533723 3533730 pt	3533723 3533728	3332201346	3559317 3559319	3559317 3559319
	35314 35311		3331321136 pt 3331321146	3533745	3533732 3533745	3332201351 3332201356 3332201361	3559321 3559323 3559324	3559321 3559323 3559325 pt
•	35312		3331321151 3331321156	3533748	3533747 3533748	3332201366 3332201371	3559326 3559328	3559325 pt 3559325 pt
3331201 pt	35316 pt	3531G pt	3331321166 pt 3331321166 pt	3533759 pt	3533744 3533759	3332201476 3332201481	3559342 3559344	3559341 pt 3559341 pt
3331201 pt	35313	3531G pt	3331321271 3331321YWV	3533761 3533700	3533761 3533700	3332201486 3332201YWV	3559346 3559300	3559341 pt 3559300
3331201 pt	3531G	3531G pt	3331323 3331323101	35338	35338 3533831	3332203 3332203101	35594	35594 3559401
3331201 pt	35317	3531N pt	3331323106	3533851	3533851 3533855	3332203106 3332203111	3559403 3559405	3559403 3559405
3331201 pt 3331201110	3531100	3531E00	3331323122 3331323226 3331323YWV	3533898 3533899 3533800	3533898 3533899 3533800	3332203116 3332203121	3559407 3559416	3559407 3559416
3331201220 3331201330	3531200 3531300	3531F00 3531G00 pt		35339	35339	3332203226 3332203YWV	3559425 3559400	3559425 3559400
3331201440 3331201550 pt	3531400 3531500 pt	3531C00 3531A00	3331325101 3331325106	3533912	3533912 3533913	333220W	35590 pt 3559000 pt	35590 pt 3559000 pt
3331201550 pt 3331201660 pt	3531500 pt	3531B00 3531G00 pt	3331325111 3331325116	3533914	3533914 3533919	333220WYWY	3559002 pt	3559002 pt
3331201660 pt 3331201770	3531600 pt	3531P20 3531N00 pt	3331325121 3331325126	3533921 3533953	3533921 3533953	3332911 3332911101	35543 3554317	35543 3554301 pt
3331201YWV pt 3331201YWV pt	3531G00 3531700 pt	3531G00 pt 3531N00 pt	3331325133 3331325136	3533955 3533957	3533955 3533957	3332911106 3332911111	3554319 3554302	3554301 pt 3554302
3331201YWV pt	3531600 pt	3531P00 pt	3331325141 3331325146	3533961 3533965	3533961 3533965	3332911116 3332911121	3554303 3554304	3554303 3554304
3331208 3331208110	35318	3531P pt 3531P70	3331325151 3331325199	3533971 3533998	3533971 3533998	3332911126 3332911131	3554305 3554309	3554305 3554309
3331208115 3331208126	3531823 3531826	3531P85 3531P06	3331325256 3331325YWV	3533982 3533900	3533982 3533900	3332911236 3332911241	3554327 3554329	3554311 pt 3554311 pt
3331208127 3331208135	3531827 3531835	3531P07 3531P11	3331327	3533A	3533A	3332911346	3554312	3554312
3331208144 3331208148	3531843 3531847	3531P25 3531P22	3331327101 3331327210	3533A78	3533A10 3533A78	3332911351 3332911361	3554313 3554315	3554313 3554315
3331208152 3331208156	3531845 3531849	3531P24 3531P27	3331327YWV	3533A00	3533A00	3332911456 3332911566	3554314	3554314 3554321
3331208199 pt 3331208199 pt	3531899 pt 3531899 pt	3531P74 3531P77 3531P82	3331329 3331329101	3533B	3533B 3533B21 3533B32	3332911571 3332911576	3554322 3554323	3554322 3554323 3554324
3331208199 pt 3331208199 pt 3331208YWV	3531899 pt	3531P82 3531P97 3531P00 pt	3331329106 3331329111 3331329YWV	3533B32	3533B32 3533B34 3533B00	3332911581 3332911586 3332911591	3554324 3554325 3554337	3554324 3554325 3554326 pt
00012001 VV V	5551000	555 11 00 pt	٧ ٧٧ ١ ٤٠٠٠٠٠	OOOODOO	5555 D 00		0007001	0007020 pt

1997 published	1997 collected	1992 published	1997 published	1997 collected	1992 published	1997 published	1997 collected	1992 published
3332911596 3332911YWV	3554339 3554300	3554326 pt 3554300	3332939 pt 3332939101 3332939111	3555801	36992 pt 3555801 3555811 pt	33329505A1 33329505A6 33329505B1	3559665 3559667 3559669	3559651 pt 3559651 pt 3559651 pt
3332913	35544 3554401 3554402	35544 3554401 3554402	3332939121 pt 3332939121 pt 3332939131	3555819 pt	3555803 3555811 pt 3699200 pt	33329505B6	3559671 3559000 pt 3559600	3559651 pt 3559000 pt 3559600
3332913321 3332913431 3332913541	3554403 3554404 3554405	3554403 3554404 3554405	3332939132 3332939141 3332939251	3555871 3555879	3555869 pt 3555869 pt 3555883	3332950YWY	3559002 pt	3559002 pt 35591
3332913YWV	3554400 35540	3554400 35540	3332939361 3332939471	3555885	3555885 3555887	3332981121 3332981201 3332981206	3559109 3559101 3559103	3559109 3559101 3559103
333291WYWW	3554000 3554002	3554002	3332939581 3332939686 3332939791	3555891	3555891 3555893 3555899	3332981211	3559105 3559107 3559111	3559105 3559107 3559111
3332921 pt	35521	35521 36992 pt	3332939YWV pt 3332939YWV pt	3555800	3555800 3699200 pt	3332981331 3332981336 3332981YWV	3559113 3559115 3559100	3559113 3559115 3559100
3332921101 3332921103 3332921106 pt 3332921106 pt	3552159 pt	3552115 3552125 3552136 3552138	333293W pt	36990 pt	35550 36990 pt	3332983 3332983101 3332983106 pt	35592 3559201 3559203 pt	35592 3559201 3559204
3332921106 pt 3332921106 pt 3332921111	3552159 pt	3552139 3552157 pt	333293WYWW pt 333293WYWW pt 333293WYWY pt	3699000 pt	3555000 3699000 pt 3555002	3332983106 pt 3332983111 3332983116	3559203 pt 3559211 3559207	3559215 pt 3559211 3559207
3332921116 3332921121 3332921131	3552153	3552153	333293WYWY pt	35561	3699002 pt 35561	3332983121	3559213 3559216 3559218	3559215 pt 3559219 pt 3559219 pt
3332921136 3332921241	3552171 3552173	3552171 3552181 pt	3332941101 3332941102 3332941103 3332941131	3556107 3556111	3556118 pt 3556118 pt 3556118 pt 3556118 pt	3332983YWV 3332985 3332985106	3559200	3559200 35595 3559503
3332921246 3332921351 3332921356	3552177 3552178	3552182 pt 3552182 pt	3332941141 pt 3332941141 pt 3332941141 pt	3556117 pt	3556105 3556106 3556109	3332985201 3332985211 3332985316	3559503	3559503 3559501 3559505 3559509
3332921461 3332921462 3332921476	3552183 3552187	3552183 3552187	3332941141 pt 3332941171 3332941YWV	3556117 pt	3556118 pt 3556121 3556100	3332985YWV 3332987 pt	3559500 35598	3559500 35598
3332921566 3332921571 3332921681	3552184	3552186 pt	3332943 3332943111	35562 3556211	35562 3556211	3332987 pt 3332987101	36395 pt	36395 pt 3559801 pt 3559801 pt
3332921686 3332921691 3332921YWV pt	3552193 3552199 3552100	3552198 pt 3552198 pt	3332943221 3332943331 3332943441	3556231 3556241	3556221 3556231 3556241	3332987106 3332987111 3332987121 3332987131	3559804	3559801 pt 3559805 3559809
3332921YWV pt	3699200 pt	3699200 pt 35522	3332943551 3332943661 3332943671 3332943681	3556265 3556273	3556251 3556265 3556273 3556289 pt	3332987141 3332987146 3332987151	3559813 3559815 3559817	3559813 3559815 3559817
3332923101 3332923106 3332923111	3552205 3552207 3552209	3552211 pt 3552211 pt 3552211 pt	3332943691 3332943YWV	3556291	3556289 pt 3556200	3332987156 3332987161	3559819 3559822	3559819 3559822
3332923216 3332923321 3332923331 3332923336	3552222	3552231 pt 3552231 pt	3332945 3332945101 3332945111	3556327	35563 3556304 3556312	3332987171 3332987181 3332987186 3332987196	3559827	3559827 3559831 3559835 3559839
3332923341 3332923346 3332923451	3552228 3552229 3552235	3552231 pt 3552231 pt	3332945116 3332945121 3332945131	3556313 3556315	3556319 pt 3556319 pt 3556319 pt	33329871B6 33329871C6 33329871G6	3559853	3559853 3559858 3559878 pt
3332923456 3332923561	3552239 3552281	3552243 pt 3552245 pt	3332945135 3332945141 3332945151 3332945161	3556331 3556333	3556319 pt 3556319 pt 3556319 pt 3556319 pt	33329871H1 33329871H6 33329871J1	3559877 3559879 3559881	3559878 pt 3559878 pt 3559878 pt
3332923566 3332923671 3332923681	3552287 3552283 3552285	3552274 pt 3552274 pt	3332945206	3556305	3556305	33329871K1 33329871K6 pt 33329871K6 pt	3559885 3559886 pt 3559886 pt	3559884 pt 3559884 pt 3559888
3332923791 3332923YWV 333292W pt	3552289	3552279 3552200 35520	3332945208 3332945371 3332945376 3332945381	3556341	3556311 3556321 pt 3556321 pt 3556321 pt	33329871M1 pt 33329871M1 pt 33329871M6 pt	3559887 pt 3559887 pt 3559892 pt	3559884 pt 3559889 pt 3559884 pt
333292W pt	36990 pt	36990 pt 3552000	3332945386 3332945391 3332945YWV	3556345 3556347	3556321 pt 3556321 pt 3556300	33329871M6 pt 33329871N1 pt 33329871N1 pt	3559892 pt 3559893 pt 3559893 pt	3559889 pt 3559884 pt 3559890
333292WYWW pt 333292WYWY pt 333292WYWY pt	3699000 pt	3699000 pt	333294W	35560 3556000	35560 3556000	33329871N6	3559891	3559891 3559896 3639510 pt
3332931 3332931101 3332931111	35551	35551 3555101 3555103	333294WYWY 3332950 pt	3556002	3556002 35590 pt	33329871R6 3332987216 3332987226	3639523 3559803 3559807	3639520 pt 3559803 3559807
3332931221 3332931331 3332931351	3555132 3555133 3555136	3555132 3555133 3555136	3332950 pt 3332950106 3332950211	3559615	35596 3559615 3559617	3332987236 3332987266 3332987276	3559811 3559825 3559829	3559811 3559825 3559829
3332931441 3332931YWV	3555135 3555100	3555135 3555100	3332950326 3332950401 pt 3332950401 pt	3559623	3559623 3559601 3559603	3332987291 33329872A1 33329872B1	3559836	3559836 3559841 3559845
3332933 pt	35552	35552 36992 pt	3332950401 pt 3332950401 pt	3559602 pt 3559602 pt	3559605 3559607 3559609	33329872C1 33329872D6 33329872F6	3559855 3559863 3559871	3559855 3559863 3559871
3332933101 3332933111 3332933221 3332933231	3555203	3555205 3555209 pt	3332950401 pt 3332950401 pt	3559602 pt	3559611 3559613	33329872J6 33329872P6 33329873D1	3559883 3559897 3559861	3559878 pt 3559897 3559861
3332933241 3332933251 3332933261	3555215 3699243 3555219	3555209 pt 3699200 pt	3332950416 3332950421 3332950431	3559619 3559621 3559625	3559619 3559621 3559625	33329873E1	3559865 3559867 3559869	3559865 3559867 3559869
3332933YWV pt 3332933YWV pt	3555200 3699200 pt	3555200 3699200 pt	3332950436 3332950441 pt 3332950441 pt 3332950446	3559630 pt	3559627 3559629 3559631 3559633 pt	33329873G1	3559874 3559843 3559899 pt	3559874 3559843 3559848
3332935 3332935101 3332935151 3332935YWV	35553	35553 3555300 pt 3555300 pt 3555300 pt	3332950451 3332950456 3332950461	3559655 3559657 3559659	3559633 pt 3559633 pt 3559633 pt	33329875R1 pt	3559899 pt	3559851 3559898 3559800
3332937 · · · · · · · · · · · · · · · · · · ·	35556	35556 3555661	3332950466 pt 3332950466 pt	3559636 pt	3559635 3559637	3332987YWV pt 333298W pt	3639500 pt	3639500 pt 35590 pt
3332937111 3332937121 3332937131	3555666 3555667 3555671	3555666 3555667 3555671	3332950471 3332950476 3332950581 pt	3559639 3559641 3559646 pt	3559639 3559641 3559645	333298W pt	36390 pt 3559000 pt 3639000 pt	36390 pt 3559000 pt 3639000 pt
3332937141 3332937151 3332937YWV	3555673 3555679 3555600	3555673 3555679 3555600	3332950581 pt 3332950586 pt 3332950586 pt	3559646 pt 3559648 pt 3559648 pt	3559647 3559643 3559649	333298WYWY pt 333298WYWY pt	3559002 pt 3639002 pt	3559002 pt 3639002 pt
3332939 pt	35558	35558	3332950591 3332950596	3559661 3559663	3559651 pt 3559651 pt	3333111 3333111000	35811 3581100	35811 3581100

1997 published	1997 collected	1992 published	1997 published	1997 collected	1992 published	1997 published	1997 collected	1992 published
3333112 3333112155	35812 3581255	35812 3581251 pt	3333191 3333191111	35891 3589111	35891 3589111	3334120344 pt 3334120463	3564344 pt	3564339 3564413
3333112159 3333112269	3581259 3581269	3581251 pt 3581269	3333191116 3333191121	3589113 3589130	3589113 3589130	3334120465 3334120573	3564415 3564433	3564415 3564433
3333112YWV	3581200	3581200	3333191131 3333191241	3589131	3589131 3589161	3334120575	3564435 3564438 pt	3564435 3564437
333311W	35810 3581000	35810 3581000	3333191251	3589163	3589163	3334120688 pt	3564438 pt	3564439
333311WYWY	3581002	3581002	3333191261 3333191271	3589167 3589170	3589167 3589170	3334120YWW pt 3334120YWW pt	3564000 pt	3564000 pt 3564300
3333120	35820 3582013 pt	35820 3582011	3333191281 3333191391	3589181 3589185	3589181 3589185	3334120YWW pt 3334120YWY	3564400 3564002 pt	3564400 3564002 pt
3333120101 pt	3582013 pt	3582012	3333191YWV	3589100	3589100	3334141	34333	34333
3333120211 3333120231	3582017 3582021	3582017 3582018 pt	3333193 3333193101	35893	35893 3589301	3334141101 3334141106	3433321 3433335	3433321 3433335
3333120241 3333120351	3582025 3582027	3582018 pt 3582027	3333193111 3333193221	3589302	3589302 3589307	3334141111	3433365	3433365
3333120361 3333120366	3582028 3582030	3582029 pt 3582029 pt	3333193YWV	3589300	3589300	3334141116 3334141YWV	3433377 3433300	3433377 3433300
3333120471 3333120491	3582031 3582091	3582031 3582091	3333195	35597	35597	3334143	34334	34334
3333120577	3582041	3582039 pt	3333195101 3333195106	3559701 3559702	3559701 3559702	3334143101 3334143106	3433411 3433413	3433410 pt 3433410 pt
3333120581 3333120586	3582045 3582049	3582039 pt 3582039 pt	3333195111 3333195116	3559703 3559704	3559703 3559704	3334143111 3334143116	3433415 3433417	3433410 pt 3433410 pt
3333120YWW 3333120YWY	3582000 3582002	3582000 3582002	3333195121 3333195126	3559705 3559709	3559705 3559709	3334143121	3433419	3433410 pt
3333131	35792	35792	3333195231 3333195YWV	3559711 3559700	3559711 3559700	3334143126 3334143131	3433421 3433422	3433410 pt 3433422
3333131000	3579200	3579200	3333197	36991	36991	3334143136 3334143141	3433430 3433440	3433430 3433440
3333134 3333134000	35784 pt	35784 pt 3578400 pt	3333197000	3699100	3699100	3334143146 3334143151	3433462 3433474	3433462 3433474
3333137	35793	35793	3333199 pt	35892	35892	3334143YWV	3433400	3433400
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