

Selected Instruments and Related Products

1998

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Information about the scope of the survey, methodology, explanation of terms and historical notes for this survey may be found in the introduction of the 1997 Manufacturing Profiles, issued August 1999.

Current data are released electronically on Internet for all individual surveys as they become available. Use: <http://www.census.gov/econ/www/manumenu.html>. Individual reports can be accessed by choosing "Current Industrial Reports (CIR's)," clicking on "Report Number Index;" from the "Industrial Products by Numeric Index," choose the survey of interest. Follow the menu to view the PDF file or to download the worksheet file (WK format) to your personal computer.

These data are also available through the U.S. Department of Commerce and STAT-USA Electronic Bulletin Board by subscription. To access, dial 202-482-3870 and follow the prompts to register. Also, you may call 202-482-1986 or 1-800-STAT-USA, for further information. The Internet address is: www.stat-usa.gov/.

NOTE:

Data are now published on the new North American Industry Classification System (NAICS) basis and therefore are not always comparable to the old Standard Industrial Classification

(SIC) code. For further information on NAICS, see www.census.gov/epcd/www/naics.html.

Summary of Findings

During 1998, the total value of shipments of selected instruments and related products totaled \$72 billion, down slightly from the 1997 value of \$72.9 billion. The 1998 figure includes automatic regulating, control, and solenoid valves, \$2.5 billion, down 2.2 percent from 1997; search, detection, navigation, guidance, aeronautical, and nautical systems, instruments, and equipment, \$28.5 billion, a decrease of 2 percent from 1997; laboratory apparatus and furniture, \$1.8 billion, down 2.3 percent from 1997; controls for monitoring residential and commercial environments, and appliance regulating controls, \$2.8 billion, up 2 percent from 1997; process control instruments, \$6.7 billion, down 6 percent; fluid meters and counting devices including motor vehicle instruments, \$3.9 billion, up 3.8 percent from 1997; test equipment and instruments to measure electricity, \$12.7 billion, an increase of 1 percent from 1997; analytical and scientific instruments (except optical), \$5.8 billion, a decrease of 4.2 percent from 1997; optical instruments and lenses, \$2.6 billion, unchanged from 1997; test equipment, instruments, and measuring and controlling devices, not elsewhere classified (n.e.c.), \$4.7 billion, an increase of 2 percent from 1997.

Current
Industrial
Reports

Address inquiries concerning these data to Investment Goods Industries Branch, Manufacturing and Construction Division (MCD), Washington, DC 20233-6900, or call Chris Blackburn, 301-457-4817.

For mail or fax copies of this publication, please contact the Information Services Center, MCD, Washington, DC 20233-6900, or call 301-457-4673.

U S C E N S U S B U R E A U

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Economics and Statistics Administration
U.S. Census Bureau



Table 1. Value of Shipments of Selected Instruments and Related Products: 1993 to 1998
 [Millions of dollars]

Product class	Product description	1998	1997	1996	1995	1994	1993
332911F	Automatic regulating and control valves.....	2,056.9	2,097.2	1,892.6	1,860.4	1,807.1	1,647.5
332911H	Solenoid-operated valves (except nuclear and fluid power transfer).....	523.4	541.1	521.8	463.8	452.3	406.0
3345111	Aeronautical, nautical, and navigational instruments.....	2,487.5	2,531.0	2,274.3	2,124.5	1,858.9	2,121.2
3345113	Search and detection, navigation and guidance systems and equipment	26,001.3	26,584.1	26,093.9	24,697.4	25,566.7	28,604.4
3391110	Laboratory apparatus and laboratory furniture.....	1,844.6	1,887.5	1,799.3	1,836.9	1,811.1	1,597.8
3345120	Controls for monitoring residential and commercial environments and appliance regulating controls.....	2,787.4	2,717.4	2,647.5	2,533.4	2,520.9	2,309.9
3345130	Process control instruments.....	6,657.6	7,073.1	6,745.1	6,438.5	6,240.0	5,934.9
3345141	Integrating and totalizing meters for gas and liquids.....	1,133.4	1,078.7	962.8	915.2	859.1	777.0
3345143	Counting devices.....	404.3	434.5	367.0	363.8	354.9	285.4
3345145	Motor vehicle instruments.....	2,363.7	2,245.1	2,218.8	2,193.1	2,092.0	1,768.1
3345151	Integrating instruments, electrical.....	465.8	457.3	458.0	445.0	440.3	461.0
3345153	Test equipment for testing electrical, radio and communication circuits, and motors.....	11,797.7	r/ 11,638.6	10,389.5	9,255.0	7,582.0	6,571.6
3345155	Instruments to measure electricity.....	411.0	r/ 455.9	499.8	554.9	554.4	525.8
3345160	Analytical and scientific instruments (except optical).....	5,803.1	6,058.6	5,478.4	5,737.2	5,534.0	4,766.1
3333141	Sighting, tracking, and fire control equipment, optical type.....	512.0	574.9	612.9	655.4	652.1	768.6
3333143	Optical instruments and lenses.....	2,060.1	2,005.0	1,748.9	1,579.1	1,596.7	1,455.8
3345191	Aircraft engine instruments (except flight).....	642.5	r/ 520.6	529.7	429.7	430.4	551.6
3345193	Physical properties and kinematic testing equipment.....	1,689.9	1,522.8	1,368.9	1,374.4	1,199.3	1,174.7
3345195	Nuclear radiation detection and monitoring instruments.....	568.6	r/ 529.6	496.5	501.2	489.1	519.4
3345197	Commercial, geophysical, meteorological, and general-purpose instruments	1,424.0	1,676.7	1,451.6	1,373.2	1,344.0	1,271.4
3345199	Surveying and drafting instruments	371.9	359.8	364.8	355.9	324.3	301.4

r/Revised by 5 percent or more from previously published data.

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998		1997		
			Quantity	Value	Quantity	Value	
332911F	Automatic valves (regulating and control type, except nuclear).....	140	(X)	b/	2,056,894	(X)	2,097,228
	Automated control valves:						
	Pneumatic actuated.....	(NA)	(X)		600,801	(X)	603,135
	Sliding stem valves.....	(NA)	(S)		304,864	(S)	306,987
332911F001	Globe body.....	24	b/	164,892	b/	208,191	138,853
332911F003	All other types.....	20	(S)	b/	96,673	(S)	a/
	Rotary valves.....	(NA)	(S)		131,845	(S)	129,658
332911F005	Ball.....	12	(S)	b/	68,838	(S)	78,012
332911F007	Butterfly.....	12		31,736		39,986	21,326
332911F009	All other rotary valves, including eccentric disk.....	10	b/	15,210	b/	23,021	b/
332911F011	All other pneumatic power-operated control valves.....	17	(S)	b/	35,577	(S)	b/
332911F013	Parts for pneumatic actuated valves sold separately.....	25	(X)	b/	128,515	(X)	121,293
	All other actuation, including electric-actuated and electro-hydraulic actuated.....	(NA)	(X)		354,713	(X)	r/
	Sliding stem valves.....	(NA)	(S)		89,589	(S)	r/
332911F015	Globe body.....	9	(S)	a/	4,693	a/	12,992
332911F017	All other types.....	14	(S)		84,896	(S)	r/
	Rotary valves.....	(NA)	(S)		75,773	(S)	61,393
332911F019	Ball 1/.....	12	(D)		(D)	(D)	(D)
332911F021	Butterfly 1/.....	7	(D)		(D)	(D)	(D)
332911F023	All other rotary valves, including eccentric disk 1/.....	8	(S)		75,773	(S)	61,393
332911F025	All other power-operated (except pneumatic) control valves 2/.....	18		4,365		165,041	4,250
332911F027	Parts for all other power-operated (except pneumatic) control valves.....	15	(X)		24,310	(X)	25,833
332911F029	Valve actuators, sold separately.....	22	a/	177,322	a/	124,209	192,571
	Regulator valves:						
332911F031	Remote-sensing direct actuated temperature regulators 2/.....	20	(S)		70,372	(S)	81,476
332911F033	Self-contained direct actuated pressure regulators (except instrument type and safety relief valves) 2/.....	34		5,058		231,467	7,158
332911F035	Pilot (internal and external) actuated pressure regulators 2/.....	31		203		78,143	219
332911F037	Self-contained direct-acting precision and instrument-type pneumatic (air and gas) pressure regulators 2/.....	13	a/	496	a/	45,537	b/
332911F039	Flow regulators for gas, vapors, or liquids 2/.....	42	b/	18,007	a/	183,598	16,997
332911F041	Other regulator valves 2/.....	29	(X)	b/	303,084	(X)	283,552
332911F043	Parts for regulator valves, sold separately.....	35	(X)		64,970	(X)	59,931
332911H	Solenoid-operated valves (except nuclear and fluid power transfer).....	45	(X)		523,403	(X)	541,067
	Solenoid-operated valves (except power transfer valves):						
	Commercial/industrial types:						
332911H001	Two-way 2/.....	33		5,144		217,405	6,497
332911H003	Three-way 2/.....	17		514		32,632	1,247
332911H005	Other 2/ 3/.....	16	(D)		(D)	(D)	(D)
332911H007	Household appliance type 2/ 3/.....	2		17,086		220,346	16,244
332911H009	Parts, components, and operators for solenoid-operated valves (except nuclear and fluid power transfer valves, sold separately).....	22	(X)		53,020	(X)	r/

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998		1997	
			Quantity	Value	Quantity	Value
3345111	Aeronautical, nautical, and navigational instruments (except aircraft engine instruments).....	84	(X)	b/ 2,487,484	(X)	2,531,017
	Flight and navigation sensors, transmitters, and displays:					
3345111101	Compasses (all types).....	15	(X)	a/ 312,228	(X)	242,052
3345111103	Altimeters (except radio and radar altimeters).....	9	(X)	a/ 20,806	(X)	23,978
3345111105	Airspeed indicators, including machmeters and air data computers).....	17	(X)	467,765	(X)	294,661
3345111107	Acceleration indicators and systems components 4/.....	8	(D)	(D)	(D)	(D)
3345111109	Rate-of-climb indicators 5/.....	5	(D)	b/ (D)	(D)	(D)
3345111111	Angle-of-attack indicators 5/.....	8	(S)	30,018	(S)	22,639
3345111113	Artificial horizon flight instruments 4/.....	4	(S)	(D)	b/ 6,707	14,704
3345111115	Other aerospace and navigational instruments 4/.....	31	(X)	a/ 616,236	(X)	662,779
	Gyroscopes, sold separately:					
3345111217	Vertical.....	5	b/ 849	b/ 8,594	b/ 2,089	b/ 10,491
3345111219	Directional.....	5	(S)	b/ 3,378	(S)	6,850
3345111221	Free, torqued and untorqued 6/.....	1	(X)	(D)	(X)	(D)
3345111223	Rate, inertial grade 6/.....	2	(X)	61,976	(X)	r/ 100,467
3345111225	Rate, noninertial grade.....	5	(X)	59,111	(X)	53,381
	Airframe equipment instruments:					
3345111227	Position indicators (mechanical, as for landing gear, cowl flaps, stabilizers, etc.).....	12	(X)	32,129	(X)	23,890
3345111229	Hydraulic system (both electrical and mechanical measuring means, as for liquid level and temperature and pressure indicators).....	12	(X)	a/ 41,187	(X)	a/ 34,893
3345111231	Cabin environmental measuring and control instruments (air-conditioning and heating, cabin pressure, oxygen, etc.).....	11	(X)	69,800	(X)	a/ 65,403
3345111233	Other aerospace flight instruments.....	22	(X)	568,745	(X)	770,357
3345111335	Nautical instruments (all types, including temperature, speed, pitch, and roll instruments and system components, etc.).....	11	b/ 183,993	b/ 58,944	b/ 262,886	a/ 68,485
3345111437	Parts and components for aeronautical, nautical, and navigational instruments (except aircraft engine instruments, sold separately).....	22	(X)	136,567	(X)	135,987
33451113	Search and detection systems and navigation and guidance systems and equipment.....	202	(X)	a/ 26,001,306	(X)	26,584,091
3345113101	Light reconnaissance and surveillance electronic systems and equipment (infrared, ultraviolet, and visible light).....	36	(X)	2,055,942	(X)	2,442,811
3345113103	IFF equipment.....	11	(X)	163,229	(X)	185,349
3345113105	Proximity fuses.....	4	(X)	(D)	(X)	(D)
	Radar systems and equipment:					
	Search, detection, and acquisition radar systems and equipment (BMEWS, airborne and other early warning radar, air traffic control radar, air defense and fighter control radar, ship radar, harbor control radar, meteorological radar, etc.):					
3345113207	Airborne and missile/space radar.....	16	(X)	2,338,409	(X)	1,942,536
3345113209	Ship (marine) radar 7/.....	14	(X)	(D)	(X)	(D)
3345113211	Ground radar 7/.....	16	(X)	1,311,251	(X)	1,264,096
	Tracking radar systems and equipment (fire control, bombing, bombing-navigational radar, aircraft and missile tracking radar, etc.):					

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Product code	Product description	No. of cos.	1998		1997	
			Quantity	Value	Quantity	Value
3345113313	Airborne and missile/space radar.....	9	(X)	(D)	(X)	(D)
3345113315	Ship (marine) radar.....	9	(X)	(D)	(X)	(D)
3345113317	Ground radar.....	18	(X)	288,082	(X)	432,159
	Instrumentation radar systems and equipment altimeters, highway speed control radar, missile and space satellite tracking range radar, GCA and other precision approach radar, etc.):					
3345113319	Airborne, missile/space and ship (marine) radar.....	7	(X)	83,318	(X)	90,380
3345113321	Ground radar.....	8	(X)	a/ 91,355	(X)	85,748
3345113323	Electronic checkout, monitoring, evaluation, and other electronic support equipment for radar systems.....	12	(X)	92,050	(X)	161,845
	Sonar search, detection, tracking and communication systems and equipment including ASW (sonar telephone communication equipment, depth finding, fire control, fusing, guidance, hydro-phones, mapping, sonabuoy, navigation, sonar fish finders, sonar range instrumentation, and other):					
3345113425	Surface ship applications (destroyers, destroyer escorts, etc.).....	22	(X)	a/ 303,421	(X)	340,525
3345113427	Submarine applications.....	17	(X)	516,116	(X)	509,549
3345113429	Airborne.....	13	(X)	a/ 226,423	(X)	169,365
3345113431	Electronic checkout, monitoring, evaluation, and other electronic support equipment for sonar systems and submerged fixed systems.....	8	(X)	a/ 146,380	(X)	156,812
3345113433	Specialized command and control data processing and display equipment, sold separately from complete systems.....	20	(X)	b/ 1,050,835	(X)	946,036
3345113435	Search, detection, identification, and tracking systems and equipment, n.e.c.	27	(X)	1,299,405	(X)	(D)
	Electronic warfare systems and equipment:					
	Countermeasures equipment:					
3345113437	Jamming equipment, communications, and radar.....	19	(X)	1,320,016	(X)	1,085,199
3345113439	Underwater countermeasures equipment.....	6	(X)	a/ 78,992	(X)	74,875
3345113441	Other active countermeasures equipment, excluding passive materials such as chaff, window, needles, and rope.....	10	(X)	a/ 95,892	(X)	236,337
3345113443	Specialized electronic and communication intelligence equipment, including specially designed DF equipment, signal reduction and processing equipment, and signal analyzers and display equipment.....	29	(X)	a/ 2,091,913	(X)	2,143,950
	Missile and space vehicle systems and equipment (beam riders, command guidance, inertial systems, infrared homing systems, radar systems, stellar trackers, television systems, combination systems, etc.):					
3345113545	Missile-borne and space-vehicle-borne equipment.....	35	(X)	4,010,064	(X)	4,385,769
3345113547	Nonmissile and space vehicle guidance equipment (ground, ship, or airborne command guidance systems, etc.).....	11	(X)	457,929	(X)	554,550
3345113549	Electronic checkout, launching, and other missile and space vehicle support systems (ground, ship, and air).....	16	(X)	547,634	(X)	450,151

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998		1997	
			Quantity	Value	Quantity	Value
	Navigation systems and equipment, navigational aids for aircraft, ship, and ground navigation (auto pilots, beacons, transponders, collision warning devices, DECCA, DME, ILS, Doppler navigation systems, inertial navigation systems, optical/laser LORAN, radio compasses and direction finders, SHORAN, TACAN, VOR, VORTAC equipment, etc.):					
	Airborne navigational systems:					
3345113651	Radio navigation receivers and displays, including OMNI, radio magnetic, glide slope/localizer, DME, etc.).....	21	(X)	a/ 847,058	(X)	a/ 570,044
3345113653	Airborne integrated data systems/ flight recorders.....	8	(X)	151,824	(X)	126,283
3345113655	Distance measuring equipment (DME).....	4	(X)	(D)	(X)	(D)
3345113657	Flight directors/situation display.....	6	(X)	(D)	(X)	(D)
3345113659	Heads-up display (HUD) systems.....	8	(X)	190,783	(X)	140,244
3345113661	Inertial navigation systems.....	7	(X)	545,766	(X)	r/ 340,753
3345113663	Proximity warning/collision avoidance equipment.....	5	(X)	225,512	(X)	195,294
3345113665	Complete automatic pilots.....	5	(X)	299,034	(X)	282,820
3345113667	Other airborne navigational systems.....	25	(X)	a/ 1,308,807	(X)	963,508
3345113669	Surface (ship and ground) navigational systems.....	37	(X)	484,715	(X)	b/ r/ 363,016
3345113671	Underwater navigational systems.....	4	(X)	(D)	(X)	(D)
3345113673	Electronic checkout, monitoring, evaluation, and other electronic evaluation, and other electronic systems and equipment.....	35	(X)	a/ 799,333	(X)	642,537
3391110	Laboratory apparatus and laboratory furniture.....	146	(X)	a/ 1,844,642	(X)	a/ 1,887,468
	Laboratory balances and scales:					
3391110111	Sensitivity of 5 centigrams or better 8/.....	8	(D)	(D)	(D)	(D)
3391110113	Sensitivity of less than 5 centigrams 8/.....	6	b/ 126,192	b/ 54,723	b/ r/ 126,725	r/ 55,188
3391110115	Laboratory furnaces and ovens.....	17	(X)	a/ 30,771	(X)	a/ 32,907
	Laboratory centrifuges:					
3391110117	Table-top type 9/.....	16	(D)	(D)	(D)	(D)
3391110119	Floor type 9/.....	6	32,305	103,792	28,622	150,562
3391110121	Laboratory distillation apparatus and rectifying apparatus 10/.....	4	(X)	(D)	(X)	(D)
3391110123	Laboratory vacuum pumps 10/.....	2	(S)	7,628	(S)	r/ 8,166
3391110125	Laboratory sterilizers and autoclaves.....	11	(X)	a/ 186,981	(X)	r/ 142,620
3391110127	Laboratory filtering or purifying apparatus 11/.....	3	(X)	(D)	(X)	(D)
3391110129	Laboratory burners and hotplates.....	10	(X)	7,876	(X)	a/ 7,635
3391110131	Laboratory heat exchangers.....	-	(X)	-	(X)	-
3391110133	Laboratory granulators, mills, and other particle size reduction apparatus.....	7	(X)	1,945	(X)	1,686
3391110135	Laboratory drying and evaporation apparatus.....	11	(X)	25,091	(X)	r/ 25,615
3391110137	Laboratory blenders, mixers, shakers, dispensers, fraction collectors, and other liquid sample preparation apparatus.....	27	(X)	b/ 131,564	(X)	b/ 122,215
3391110139	Laboratory incubators.....	12	b/ 31,727	a/ 54,672	a/ 31,763	a/ 56,217
3391110141	Environmental test chambers.....	18	(S)	a/ 143,360	(S)	a/ 137,742
3391110143	Laboratory freezers.....	8	b/ 10,695	49,157	a/ 9,902	46,648
3391110145	Microtomes 11/.....	2	(D)	(D)	(D)	(D)
3391110231	Laboratory furniture, including cabinets, cases, benches, tables, stools, reagent shelves, etc. 12/.....	20	(X)	a/ 287,429	(X)	a/ 265,934
3391110233	Parts and components for laboratory furniture, sold separately 12/.....	4	(X)	(D)	(X)	(D)
3391110151	All other laboratory apparatus, n.e.c. 11/.....	78	(X)	634,711	(X)	a/ 651,211

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998		1997		
			Quantity	Value	Quantity	Value	
3391110155	Components, parts and accessories for laboratory and scientific apparatus, sold separately.....	53	(X)	124,942	(X)	183,122	
3345120	Controls for monitoring residential and commercial environments and appliance regulating controls.....	102	(X)	a/ 2,787,363	(X)	2,717,360	
	Automatic controls of the type principally used as components of air-conditioning, refrigeration, and comfort heating, including pneumatic controls:						
	Temperature responsive (thermostats):						
3345120101	Electric 2/ 13/.....	34	a/	52,510	399,462	45,876	418,692
3345120103	Pneumatic 2/ 13/.....	4	(D)	(D)	(D)	(D)	(D)
3345120105	Pressure responsive (pressurestats) 2/.....	10	2,547	a/ 27,886	a/ 2,476	a/ 34,831	
3345120107	Hydronic responsive 2/.....	5	2,085	43,943	2,242	49,124	
3345120109	Humidity responsive (humidistats) 2/ 14/....	6	(D)	(D)	(D)	(D)	
3345120111	Light responsive 2/ 14/.....	2	5,437	36,446	b/ 6,135	a/ 25,084	
3345120113	Liquid level 2/.....	9	(S)	b/ 40,625	(S)	b/ r/ 23,674	
3345120115	Igniters 2/ 15/.....	8	(D)	(D)	(D)	(D)	
3345120117	Inherent motor protectors 2/ 15/.....	4	167,078	319,586	b/ r/ 180,229	362,775	
3345120219	Microprocessor-based load programmers for buildings energy control 2/.....	11	(S)	b/ 54,537	(S)	a/ 51,618	
3345120221	Computerized energy control systems or buildings.....	10	(S)	453,509	(S)	443,609	
3345120223	Other.....	21	(X)	621,585	(X)	547,640	
	Controls for major appliances such as domestic laundry and cooking appliances, refrigerators and freezers, vending machines, air conditioners, etc.:						
3345120225	Temperature responsive 2/.....	17	111,567	319,881	r/ 137,868	310,934	
3345120227	All other controls for appliances 2/.....	15	28,914	284,508	(S)	276,763	
3345120229	Parts and components for controls monitoring residential and commercial environments and for appliance regulating controls, sold separately.....	25	(X)	a/ 185,395	(X)	a/ 172,616	
3345130	Process control instruments.....	515	(X)	6,657,574	(X)	7,073,117	
	General-purpose control system instruments (commonly call receiver-type), operating from standardized transmission signals (electrical types ac or dc milliampere, millivolt, or telemetering signals; pneumatic types, 3 to 15 and 3 to 27 p.s.i. signals):						
	Electronic systems - unified architecture type:						
3345130101	Controllers (recording, indicating, or blind).....	37	b/ 188,041	b/ 166,935	b/ 212,296	a/ 167,768	
3345130103	Recorders, with or without self-contained set-point stations.....	19	(S)	105,275	(S)	98,879	
3345130105	Indicators, with or without self-contained set-point stations.....	26	b/ 120,167	41,496	b/ r/ 114,613	r/ 44,954	
3345130107	Auxiliary stations and analog computing devices associated with the above, including manual loaders, auto-to-manual stations, ratio stations, adders, multipliers, integrators, etc.	13	(S)	a/ 67,339	(S)	a/ 75,209	
3345130109	Electronic systems - nonunified architecture type.....	67	(X)	1,225,204	(X)	1,427,733	
3345130111	Industrial multifunction process computers.....	61	(X)	a/ 693,190	(X)	r/ 685,827	
	Pneumatic systems, including all system-type control, display and computing instruments actuated from standardized pneumatic transmission signals:						

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998			1997		
			Quantity	Value	Quantity	Value		
3345130113	Controllers (recording, indicating, or blind).....	13	126,635	47,816	a/ 125,851	60,784		
3345130115	Recorders, with or without self-contained set-point stations 16/.....	5	(D)	(D)	(D)	(D)		
3345130117	Indicators, with or without self-contained set-point stations 16/.....	6	(S)	11,250	(S) r/	10,054		
3345130119	Auxiliary stations and analog computing devices associated with the above, including manual loaders, auto-to-manual stations, ratio stations, adders, multipliers, integrators, etc.	4	b/ 49,578	b/ 7,048	53,921	8,565		
3345130121	Receiver-type gauges, analog and digital.....	9	(S)	9,118	(S)	8,482		
3345130123	Annunciators, industrial; electromechanical and solid-state types.....	7	a/ 27,894	a/ 24,324	a/ 23,720	a/ 20,633		
	Temperature measuring instruments, excluding general-purpose receiver-type instruments:							
	Electrical and electronic measuring types (thermocouple, resistance temperature detector, radiation, optical, thermistor, and other electrical sensors):							
3345130225	Direct-deflecting types (controllers for all types of electrical temperature sensors).....	6	(S) a/	7,464	(S) a/	7,535		
3345130227	Direct-deflecting types (indicators and recorders for all types of electrical temperature sensors).....	9	(S) a/	5,917	(S) b/	5,867		
3345130229	Electromechanical self-balancing types (electric or pneumatic controllers for all types of electrical temperature sensors) 17/.....	2	(D)	(D)	(D)	(D)		
3345130231	Electromechanical self-balancing types (indicators, recorders, and integrators for all types of electrical temperature sensors) 17/.....	3	(S)	6,044	(S)	6,796		
3345130233	Electronic controllers for all types of electrical temperature sensors.....	24	a/ 411,268	120,418	a/ 413,219	r/ 125,665		
3345130235	Digital indicators for all types of electrical temperature sensors, excluding data loggers.....	32	b/ 61,051	b/ 21,642	b/ 73,690	a/ 28,845		
3345130237	Transmitters, producing standardized electric or pneumatic analog transmission signals for all types of electrical temperature sensors:							
	Electric.....	22	b/ 140,338	40,859	b/ r/ 166,172	r/ 47,207		
3345130239	Pneumatic.....	4	436	588	b/ 523	902		
	Mechanical measuring types, filled systems (liquid filled, vapor pressure, gas filled, and mercury filled types):							
3345130241	Indicating or recording controllers.....	9	(S) a/	20,120	(S) a/	17,160		
3345130243	Recorders, noncontrol.....	10	(S)	13,740	(S) a/	15,960		
3345130245	Indicators only, excluding indoor-outdoor and other household or appliance type thermometers.....	15	a/ 460,839	b/ 12,995	a/ 487,358	a/ 14,779		
3345130247	Transmitters producing standardized electric or pneumatic analog transmission signals.....	11	b/ 32,780	b/ 13,350	b/ 47,009	b/ 15,109		
	Primary temperature sensors, excluding aircraft types:							
3345130249	Thermocouples and thermocouple lead wire.....	65	(X) a/	235,138	(X)	226,789		

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998				1997			
			Quantity		Value		Quantity		Value	
3345130251	All other types (resistance temperature detectors, radiation and optical sensors, thermistors, etc.).....	46	(X)	a/	127,016		(X)	a/	103,992	
	Pressure (gauge, absolute vacuum) and draft measuring instruments, excluding general-purpose receiver-type instruments:									
3345130253	Indicating or recording controllers.....	15	b/		134,810	a/		b/ r/	147,142	
3345130255	Recorders, noncontrol.....	8	b/		12,223			b/	13,799	
	Indicators only, excluding receiver-type gauges:									
3345130257	3-inch diameter and over 2/.....	20	a/		3,781	a/		a/	3,828	
3345130259	Under 3-inch diameter 2/.....	19			29,385	a/		a/	28,300	
	Transmitters producing standardized analog transmission signals:									
3345130261	Transmitters producing standardized electronic analog transmission signals 2/.....	32	(S)	a/	169,682		(S)		208,493	
3345130263	Transmitters producing standardized pneumatic analog transmission signals.....	6	(S)	a/	3,309		(S)	a/	3,839	
	Flow and liquid level measuring instruments, excluding general-purpose receiver-type instruments:									
	Differential pressure types:									
3345130265	Indicating or recording controllers.....	10			120,912			r/	106,928	
3345130267	Recorders, noncontrol, and indicators, noncontrol.....	14	b/		56,306	b/			55,873	
	Transmitters producing standardized analog transmission signals:									
3345130269	Transmitters producing standardized electronic analog transmission signals.....	22	b/		253,873			b/	293,804	
3345130271	Transmitters producing standardized pneumatic analog transmission signals.....	10	b/		17,455	b/		b/	20,560	
3345130273	Primary pressure sensors (load cells, strain gauges, etc.).....	10	b/		68,853	b/			69,411	
3345130275	Primary flow elements, including orifice plates, venturi tubes, low tubes, flow nozzles, pitot tubes, etc.	16	b/		374,701	a/		b/	392,435	
	Electromagnetic flowmeters:									
3345130277	Primary device (magnetic flow tube).....	13	b/		60,015	b/		b/	62,696	
3345130279	Secondary device (magnetic transmitter, recorder, indicator or controller which receives signal directly from primary device).....	13	b/		41,044	a/		b/	46,464	
3345130281	Capacitance, ultrasonic, and other electronic types, including magnetic resonance, vortex-precession, and vortex-shedding type elements.....	40	b/		191,557	b/		b/	212,188	
3345130283	Variable area-controlling, recording, indicating, and transmitting instruments and associated primary flow elements 2/.....	15	a/		572	b/		a/	617	
3345130285	Float and displacement (controlling, recording, indicating, and transmitting instruments and associated primary flow elements) 2/.....	26	a/		1,733	a/		a/	1,812	
3345130287	Turbine and propeller: controlling, recording, indicating, and transmitting instruments and associated primary flow elements.....	12	b/		61,542	b/		a/	80,015	
3345130289	Mass flow, i.e., controlling, thermal-controlling, recording indicating, and transmitting instruments and associated primary flow elements.....	15	a/		54,863				58,520	

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998				1997			
			Quantity		Value		Quantity		Value	
3345130291	Other types: controlling, recording, indicating, and transmitting instruments and associated primary flow elements.....	15	a/	151,436	b/	54,134	a/	167,645	a/	56,749
3345130293	Humidity instruments (controlling, recording, indicating, and transmitting, and associated primary humidity elements, excluding home and general-purpose type).....	13		(S)		36,649		(S)		39,831
	Continuous process instruments for on-stream gas and liquid analysis, including indicators, recorders, controllers, and analysis electrodes and cells, excluding laboratory analysis types:									
3345130295	Chromatographic analyzers.....	13		3,393		74,457	b/	3,200		77,914
3345130297	Infrared analyzers.....	13	a/	10,020		61,012	a/	10,398		66,559
3345130299	Oxygen analyzers.....	16	b/	22,563	a/	51,731	b/	23,974	a/	62,859
334513021A	Other gas analyzers.....	26	a/	49,731		108,512	a/	50,787		110,527
334513021C	Ph analyzers.....	17	a/	76,672		44,380	b/	75,875	a/	44,802
334513021E	Other liquid analyzers.....	24	a/	86,270	a/	72,008	a/	86,520		70,923
	Instruments for all process variables not listed above (speed, weight, position, sequence, density, specific gravity, mechanical load, electrical load, millivolts):									
	Electrical and electronic measuring types:									
334513011G	Direct-deflecting type controllers, indicators, and recorders.....	4		(S)	a/	15,654		(S)	a/ r/	8,996
334513011J	Electromechanical self-balancing electric or pneumatic controllers, indicators, recorders, integrators.....	4		(S)	b/	2,139		(S)	b/	2,352
334513021L	Digital indicators.....	18	b/	135,921	b/	38,779	b/	148,039	b/	39,641
334513021M	Transmitters producing standardized electric or pneumatic analog transmission signals.....	11	b/	36,283		15,910	b/	55,640		32,047
	Mechanical measuring types:									
334513021P	Indicating or recording controllers and recorders, noncontrol.....	4		8,020		2,487		9,661		2,932
334513021R	Indicators only.....	4		(S)	a/	11,828		(S)		13,038
334513021T	Transmitters producing standardized electric or pneumatic analog transmission signals.....	15	b/	294,326		51,973	b/	295,009		55,189
	All other industrial process instruments:									
334513022A	Other temperature instruments 18/.....	29		(X)		(D)		(X)		(D)
334513022C	Other flow and liquid level instruments.....	29		(X)	a/	136,733		(X)	a/	175,471
334513022E	Other continuous process instruments.....	36		(X)	b/	298,117		(X)	a/	330,217
334513022G	Other industrial type instruments 18/.....	62		(X)	b/	559,548		(X)	a/ r/	565,889
	Parts, supplies, accessories, other primary sensors, n.e.c., panelboards, and other equipment associated with process control instrumentation:									
334513032J	Primarily designed for temperature instruments.....	18		(X)	a/	49,127		(X)		41,429
334513032L	Primarily designed for flow and liquid level instruments.....	30		(X)	b/	73,730		(X)	a/	88,664
334513032N	Primarily designed for continuous process instruments.....	28		(X)		138,017		(X)		128,841
334513032P	Primarily designed for industrial type instruments.....	39		(X)	b/	94,708		(X)	a/	103,765
3345141	Integrating and totalizing meters for gas and liquids..... Gas meters, consumption registering; Diaphragm type; positive displacements; aluminum, iron, and tin case:	45		(X)		1,133,368		(X)		1,078,725

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998		1997	
			Quantity	Value	Quantity	Value
3345141001	Residential size (up to 400 cu. ft/hr of 0.64 specific gravity gas, at 0.5 inches water drop) 2/.....	4	2,175	104,764	2,497	121,137
3345141003	Other sizes, including commercial and industrial.....	6	a/ 127,220	38,517	a/ 140,490	43,294
3345141005	Turbine type (all sizes) 19/.....	8	(D)	(D)	(D)	(D)
3345141007	Other gas meters, consumption registering 19/.....	3	a/ 48,002	a/ 61,532	a/ 52,360	a/ 67,349
	Liquid meters, positive displacement with registers and counters:					
	Water meters, consumption registering:					
3345141009	Small meters, up to and including 1 inch 2/.....	9	4,659	229,189	4,715	220,719
3345141011	Intermediate meters, over 1 inch up to and including 2 inch.....	11	162,092	40,969	r/ 198,587	43,273
3345141013	Large meters, over 2 inch.....	11	336,012	a/ 81,157	r/ 328,906	77,907
3345141015	Liquid fuel dispensing meters, excluding service station dispensing pumps 20/.....	8	(D)	(D)	(D)	(D)
3345141017	Other liquid meters; industrial bulk plants, pipeline, batching, and treatment facilities 20/.....	18	a/ 1,428,771	335,773	b/ 967,213	277,261
3345141019	Parts, components, and accessories for gas and liquid meters, sold separately.....	32	(X)	a/ 241,467	(X)	227,785
3345143	Counting devices, excluding motor vehicle instruments.....	42	(X)	a/ 404,335	(X)	434,451
3345143001	Mechanical input 2/.....	9	(S)	40,494	(S)	43,031
3345143003	Electrical input 2/.....	13	1,046	25,880	b/ 1,140	a/ 32,504
3345143005	Electronic input.....	16	645,703	91,541	629,244	60,091
3345143007	All other counting devices not specified above, including toll meters, fare collection equipment (systems), parking lot systems, etc., but excluding parking meters.....	11	(X)	237,592	(X)	290,865
3345143009	Components and parts for counting devices (except parking meters), sold separately.....	7	(X)	8,828	(X)	r/ 7,960
3345145	Motor vehicle instruments.....	29	(X)	2,363,722	(X)	2,245,148
3345145001	Speedometers (speedometers including odometers are classified as speedometers).....	9	(X)	a/ 17,225	(X)	18,459
3345145003	Tachometers.....	8	(X)	b/ 20,405	(X)	23,981
3345145005	Odometers (speedometers including odometers are classified as speedometers).....	5	(X)	1,025	(X)	1,750
3345145007	Fuel level gauges.....	7	(X)	b/ 5,411	(X)	8,786
3345145009	Water temperature gauges.....	10	(X)	a/ 25,547	(X)	28,659
3345145011	Ammeters.....	8	(X)	b/ 3,047	(X)	5,797
3345145013	Oil pressure gauges.....	6	(X)	b/ 9,720	(X)	9,857
3345145015	Instrument panels, including cluster modules.....	14	(X)	2,207,756	(X)	2,082,170
3345145017	Other motor vehicle instruments.....	17	(X)	b/ 73,586	(X)	65,689
3345151	Integrating instruments, electrical.....	19	(X)	b/ 465,750	(X)	457,275
	Ac watt-hour meters:					
3345151001	Single phase 2/.....	7	b/ 5,161	122,131	b/ 5,470	134,569
3345151003	Polyphase.....	7	289,980	31,357	r/ 289,312	31,776
3345151005	Demand meters (kW and kVA), combined watt-hour and demand meters (single phase and polyphase), and combined watt-hour and time switch meters.....	8	b/ 688,613	141,460	b/ 626,062	134,878
3345151007	Other electrical integrating meters, including dc watt-hour meters, ampere-hour meters, and other miscellaneous integrating instruments not included in the above classifications.....	8	(X)	a/ 84,258	(X)	a/ 62,231

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998		1997	
			Quantity	Value	Quantity	Value
3345151009	Parts and accessories for electric integrating meters, including meter mountings and registers, sold separately.....	8	(X)	86,544	(X)	93,821
3345153	Test equipment for testing electrical, radio and communication circuits, and motors.....	363	(X)	b/ 11,797,730	(X)	r/ 11,638,606
	Voltage, current, and resistance measuring equipment (except multimeters):					
	Electronic:					
3345153001	Digital.....	26	(X)	395,614	(X)	397,604
3345153003	Analog.....	26	(X)	50,137	(X)	52,231
3345153005	Electrical, excluding panel meters.....	13	(X)	a/ 65,487	(X)	61,411
	Multimeters:					
3345153007	Electronic, digital and analog 21/.....	11	(X)	(D)	(X)	(D)
3345153009	Electrical 21/.....	5	(X)	146,388	(X)	145,286
	Power and energy measuring equipment:					
	Electronic:					
3345153011	Analog.....	6	(X)	5,093	(X)	6,603
3345153013	Digital.....	13	(X)	(D)	(X)	(D)
3345153015	Electrical power measuring equipment, excluding electrical integrating instruments, sold separately.....	3	(X)	(D)	(X)	(D)
	Frequency counters, timers, and other frequency and time measuring equipment, excluding standards:					
3345153017	Universal counters with time interval measuring capability 22/.....	5	(X)	(D)	(X)	(D)
3345153019	Other frequency counters 22/.....	6	(X)	b/ 5,358	(X)	20,923
3345153021	Frequency meters 23/.....	5	(X)	(D)	(X)	(D)
3345153023	Other frequency counting and time measuring equipment 23/.....	6	(X)	a/ 95,638	(X)	136,394
	Waveform measuring and/or analyzing equipment:					
3345153025	Oscilloscopes and plug-in accessories 24/.....	8	(X)	(D)	(X)	(D)
3345153027	Spectrum analyzers 24/.....	6	(X)	(D)	(X)	(D)
3345153029	Other waveform measuring and analyzing equipment 24/.....	18	(X)	926,070	(X)	1,014,773
	Signal generating equipment:					
3345153031	Audio.....	10	(X)	15,840	(X)	a/ 21,098
3345153033	RF (over 20 kHz to 890 MHz) 25/.....	15	(X)	(D)	(X)	(D)
3345153035	Microwave (890 MHz and above) 25/.....	12	(X)	289,364	(X)	436,492
	Field strength and intensity measuring equipment, including RFI measuring equipment:					
3345153037	Electronic.....	12	(X)	a/ 251,663	(X)	125,480
3345153039	Electrical field measuring equipment.....	3	(X)	(D)	(X)	7,504
	Impedance and standing wave ratio measuring equipment (transfer function measuring equipment):					
3345153043	Electronic impedance and related measuring equipment.....	9	(X)	b/ 21,665	(X)	b/ 20,258
3345153045	Standing wave measuring equipment (slotted lines, sliding shorts, reflectometers, and other SWR equipment).....	5	(X)	5,936	(X)	8,694
3345153047	X-Y plotters (recorders), electronic.....	3	(X)	(D)	(X)	(D)
	Automatic test and measuring equipment:					
3345153049	Combination and/or group test sets.....	42	(X)	1,878,590	(X)	r/ 1,821,641
	Component part test sets:					
3345153051	Electron tube test equipment.....	3	(X)	312	(X)	652
	Semiconductor component test equipment:					
3345153053	Memory.....	18	(X)	a/ 257,268	(X)	250,792
3345153055	Linear.....	10	(X)	b/ 161,818	(X)	r/ 207,214

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998			1997				
			Quantity		Value	Quantity		Value		
3345153057	Microprocessor.....	14	(X)		435,599	(X)		620,635		
3345153059	Other semiconductor component test equipment.....	40	(X)		2,418,853	(X)		1,159,592		
3345153061	Circuit board loaded test equipment.....	14	(X)	b/	233,229	(X)	b/ r/	217,060		
3345153063	Other component part test sets and equipment.....	28	(X)		811,818	(X)	r/	913,867		
3345153065	Equipment and subassembly test equipment, n.e.c., including disc drive testers, power supply testers, etc.	24	(X)	a/	155,220	(X)	a/ r/	289,940		
	Standards and calibration equipment for test measuring equipment, including laboratory types (metered bench top, rack-mountable, or plug-in equipment):									
3345153067	Electronic 26/.....	26	(X)		(D)	(X)		(D)		
3345153069	Electrical 26/.....	5	(X)	a/	141,675	(X)		278,948		
	Analyzers for testing characteristics of internal-combustion engines, excluding aircraft:									
3345153071	Portable.....	6	(X)	b/	415,681	(X)		227,146		
3345153073	Other.....	6	(X)	b/	85,773	(X)		79,247		
	Communications test equipment, n.e.c.:									
3345153075	Network analyzers.....	17	(X)		380,741	(X)		537,336		
3345153077	Cable backplane and other continuity testers.....	12	(X)		70,581	(X)	a/	79,954		
3345153079	Fiber optics test equipment (OTDR, optical S/N meters, etc.).....	11	(X)	a/	241,594	(X)	a/ r/	214,020		
3345153081	Other communications test, monitoring, and control equipment (except microwave).....	37	(X)	a/	593,518	(X)		624,651		
3345153083	Microwave test equipment, n.e.c., (1,300 MHz and above).....	7	(X)		37,632	(X)		33,636		
	Logic test, development, and analysis equipment:									
3345153085	Logic analyzers, and similar logic state, timing, and signature analyzers 27/.....	5	(X)		(D)	(X)		(D)		
3345153087	Microprocessor development systems 27/.....	8	(X)	a/	240,816	(X)		251,533		
3345153089	Pulse, function, and data generators and similar metered frequency synthesizers.....	11	(X)		135,096	(X)		115,113		
3344160041	Portable instrument transformers.....	5	(X)		(D)	(X)		131,848		
3345153091	Other field service test and measurement equipment, logic probes, clips, and pulsers.....	6	(X)	a/	17,437	(X)	a/	35,873		
3345153093	Other measuring and checking instruments for testing electrical, radio and communication circuits, and motors 28/.....	29	(X)		(D)	(X)		(D)		
3345153095	Other analyzing instruments for checking electrical quantities 28/.....	8	(X)		418,595	(X)		546,563		
3345153097	Parts and components for test equipment for testing electrical, radio and communication circuits, and motors, sold separately.....	40	(X)	a/	175,793	(X)	a/	246,374		
3345155	Instruments to measure electricity.....	81	(X)	a/	410,988	(X)	a/ r/	455,906		
	Electrical indicating instruments:									
	Panel type instruments:									
3345155001	Digital panel meters (DPM) between 0.05 percent and 1 percent, plus or minus one-digit accuracy, excluding precision DVM's and electronic counters.....	19	b/	721,472	a/	79,940	b/	700,230	r/	113,635
3345155003	Analog solid state panel meters (generally of plus or minus 2-percent accuracy) with LED, LCD, or neon gas discharge display.....	8	b/	30,897	b/	4,252	b/	30,761	b/	4,518

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Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998				1997			
			Quantity		Value		Quantity		Value	
	Panel types other than ruggedized or sealed (generally of 2 percent accuracy):									
3345155005	Ac, including moving iron vane and dynamometer types.....	9	b/	265,749	a/	6,238	a/	294,845	a/	6,756
3345155007	Dc, including rectifier and self-contained thermocouple types 2/.....	12	b/	1,069	b/	28,003	b/	1,065		25,985
3345155009	Panel types ruggedized or sealed (generally of 2-percent accuracy).....	9	b/	33,725	b/	8,695	b/	42,633	b/	8,856
3345155011	Panel types with control or signal initiating means, including instrument relays.....	5	b/	14,972	b/	3,009	b/ r/	17,702	b/ r/	2,630
3345155013	All other panel type instruments, including ammeters and voltmeters for motor vehicles 2/.....	11	b/	2,058	b/	44,309	b/ r/	2,004	b/	42,721
	Switchboard instruments which are generally of 1-percent accuracy:									
3345155015	Ac, including moving iron vane and dynamometer types 29/.....	2		(D)		(D)		(D)		(D)
3345155017	Dc, including rectifier and thermocouple types 29/.....	5		20,176		3,045		26,885		3,091
3345155019	Elapsed time meters (with and without reset) 2/.....	7		(S)	b/	22,670		(S)	b/	22,906
3345155021	Portable instruments which are generally capable of accuracies within plus or minus 2-percent of full scale indication, and can be enclosed in a case so that they can be moved and used at various locations, and which are an end product.....	15	b/	403,529		47,728	b/	506,696		51,508
	Electrical recording instruments (portable and for panel mounting):									
3345155023	Direct deflecting (direct acting), (except temperature calibrated instruments) 30/.....	2		(D)		(D)		(S)	b/	4,158
3345155025	Oscillographic recorders, pen or stylus, and light beam type 30/.....	2		(X)		(D)		(X)		(D)
3345155027	Other electrical recording instruments 30/.....	18		(X)	a/	83,615		(X)	b/ r/	90,112
	Parts and accessories for indicating and recording instruments:									
3345155029	Transducers for volts, amperes, watts, vars, frequency, temperature and power factor.....	15		(X)	a/	34,751		(X)	a/ r/	33,069
3345155031	Tachometer generators (except aerospace types) 31/.....	4		(X)		(D)		(X)		(D)
3345155033	Other, including instrument shunts 31/.....	17		(X)		44,733		(X)		45,961
3345160	Analytical and scientific instruments (except optical).....	291		(X)	a/	5,803,130		(X)		6,058,618
	Electrochemical instruments:									
3345160001	Ph electrodes and meters.....	19		(X)	b/	65,319		(X)	b/	60,436
3345160003	Ion selective electrodes and meters.....	12		(X)	b/	31,740		(X)	b/ r/	33,122
3345160007	Electrophoresis instruments.....	12		(X)	b/	60,941		(X)	r/	88,098
3345160009	Other (except process type), including photometers.....	11		(X)	b/	13,895		(X)	b/	14,945
	Chromatographic instruments:									
3345160011	Gas 32/.....	17		(D)		(D)		(D)		(D)
3345160013	Liquid.....	26		(S)	a/	577,503		(S)		546,950
3345160015	Other, including paper, gel, thin layer 32/.....	4		(X)	b/	291,716		(X)		264,399
	Spectrophotometric instruments:									
3345160017	Atomic absorption 33/.....	3		(X)		(D)		(X)		(D)
3345160019	Optical emission, including spark, arc, and glow, spectrographs, all other (except ICP) 33/.....	7		(X)		(D)		(X)		(D)

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998			1997		
			Quantity		Value	Quantity		Value
3345160021	Optical emission, including laser excited source, which includes laser microprobe source emission, laser source Raman, and laser microprobe source Raman spectrometers 33/.....	5	(X)		(D)	(X)		(D)
3345160023	Optical emission with inductively coupled plasma, ICP 33/.....	3	(X)		151,050	(X)		169,750
3345160025	Infrared including Fourier transfer methods.....	19	(X)	b/	140,436	(X)	b/	178,835
3345160027	Ultraviolet, visible and colorimeters.....	20	(X)	b/	147,334	(X)		161,254
3345160029	Fluorescent instruments, including fluorometers (except chemicals).....	13	(X)		43,920	(X)		39,448
3345160031	Color measuring devices.....	9	(X)	a/	80,519	(X)	r/	89,743
3345160033	Other, including vacuum ultraviolet, Raman, light scattering reflectors, helium glow, and light measuring.....	13	(X)	a/	28,417	(X)	a/	30,789
3345160035	Thermal analysis instruments, including thermogravimetric analyzers (TGA), quantitative thermal analyzers (QTA) and differential thermal analyzers (DTA).....	11	(X)	a/	134,462	(X)		198,219
3345160037	Nuclear magnetic resonance spectrometers, including electron paramagnetic spin types (EP) 34/.....	3	(D)		(D)	(D)		(D)
3345160039	Microscopes, scanning type, including electron and proton.....	6	694	b/	102,716	687	a/	94,666
3345160041	Particle beam excitation instruments, including electron microprobes, augers, energy ion spectrometers, secondary ion mass spectrometers (SIMS), ion microprobes 34/.....	3	b/	463	149,954	r/	512	151,994
3345160043	Photon excitation analyzers, including: X-ray fluorescence, simultaneous; X-ray fluorescence, sequential; X-ray fluorescence, sequential with diffraction; X-ray fluorescence, diffraction; X-ray diffraction; and energy dispersive systems (EDSs).....	12	b/	2,269	b/ 76,193	a/ r/ 2,746	b/ r/ 74,572	
3345160045	Mass spectroscopy instrumentation.....	16	(X)		329,049	(X)		372,136
3345160047	Clinical laboratory instrumentation, including instruments used in the clinical laboratory for measuring, analyzing, and processing clinical clinical specimens.....	(NA)	(X)		1,136,014	(X)	r/	1,169,743
3345160049	Chemistry (measure and identify substances, e.g., metabolites, enzymes, and drugs).....	10	b/	12,999	283,535	a/ r/ 12,625		242,471
3345160051	Hematology (measure and identify substances or cells contained in blood or substances influencing the development and clotting of blood, e.g., cell counting coagulation factors).....	9		10,172	301,638	r/ 14,437	r/	368,989
3345160053	Microbiology (enumerate or identify pathogenic organisms or measure their susceptibility to anti-microbial agents) 35/.....	5	(D)		(D)	(D)		(D)
3345160055	Histology (process tissue and cells, e.g., tissue processors, cell stainers) 35/.....	2	(D)		(D)	(D)		(D)
3345160057	Blood bank and immunology (process blood and specimens for testing; measure and identify, using immunoassay, substances in clinical specimens) 35/.....	8	(S)	a/	397,598	(S)		399,063
3345160059	Other clinical laboratory instrumentation not specified above.....	15	b/	51,812	153,243	b/ 68,041		159,220
3345160059	Organic elemental analysis instruments, including carbon, hydrogen, nitrogen, oxygen, and sulphur.....	13	a/	41,964	a/ 83,888	r/ 67,385		86,748

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998		1997			
			Quantity	Value	Quantity	Value		
3345160061	Amino acid, protein and/or peptide, including chromatographic type 36/.....	7	(D)	(D)	a/	872	52,505	
3345160063	Gas detectors.....	23	362,583	90,482		403,550	91,531	
3345160065	Other analytical and scientific instruments, n.e.c., including molecular weight, monochrometers (analytical type), nephelometers (except meteorological), osmometers, particle size analyzers, photo multipliers, surface area analyzers, turbidometers, and breatholyzers 36/.....	101	(X)	a/	1,269,347	(X)	a/	897,437
3345160067	Parts, components, and accessories for analytical and scientific instruments, sold separately, including photo tubes, thermal conductivity sensors, thermopiles, etc.	110	(X)	a/	798,235	(X)		1,191,298
3333141	Sighting, tracking, and fire control equipment optical type.....	40	(X)	b/	511,998	(X)		574,875
3333141001	Made from lenses, prisms, etc., produced in the same plant.....	10	(X)	a/	69,337	(X)		70,252
3333141003	Made from purchased lenses, prisms, etc.	27	(X)	b/	413,325	(X)	a/	458,763
3333141005	Parts and accessories.....	14	(X)	a/	29,336	(X)		45,860
3333143	Optical instruments and lenses.....	160	(X)	b/	2,060,141	(X)		2,004,966
3333143111	Binoculars, prismatic and nonprismatic, terrestrial and celestial telescopes.....	11	(X)		56,137	(X)		39,868
3333143113	Other astronomical instruments, excluding radio astronomy.....	6	(X)		17,832	(X)		13,635
3333143115	Parts and accessories, including mountings for binoculars, optical telescopes and other astronomical equipment.....	12	(X)		15,622	(X)	r/	13,697
3333143231	Optical test and inspection equipment, including standard sources, modulators, optical comparators, interferometers (except optical microscopes).....	40	(X)		190,054	(X)		215,660
3333143233	Optical microscopes.....	11	(X)		48,221	(X)		60,225
3333143235	Optical components: Filters, including parts and accessories thereof.....	32	(X)	a/	79,873	(X)		78,134
3333143237	Lenses (except ophthalmic focus lenses): Unmounted lenses.....	39	(X)	a/	168,418	(X)	a/	140,333
3333143239	Mounted lenses: Photographic lenses.....	6	(X)	a/	1,475	(X)	a/	1,123
3333143241	Other mounted lenses.....	18	(X)	a/	258,282	(X)	a/	271,234
3333143243	Other (prisms, mirrors, etc.).....	50	(X)		139,717	(X)		186,194
3333143245	Other optical instruments, including optical alignment and display instruments; excluding analytical instruments and binoculars and astronomical instruments listed above, and sighting and fire control equipment.....	43	(X)		848,104	(X)		786,022
3333143247	Parts and accessories for other optical microscopes 37/.....	10	(X)	b/	236,406	(X)	b/	19,866
3333143249	Parts and accessories for other optical instruments 37/.....	21	(X)		(D)	(X)		178,975
3345191	Aircraft engine instruments (except flight).....	39	(X)	a/	642,511	(X)	r/	520,563
3345191001	Temperature sensors, transmitters, and displays.....	22	(X)		203,494	(X)		146,374
3345191003	Pressure ratio sensors, displays, and controls 38/.....	6	(X)		(D)	(X)		(D)
3345191005	Pressure and vacuum sensors, transmitters, and displays 38/.....	12	(X)		105,434	(X)		59,562

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998			1997		
			Quantity		Value	Quantity		Value
3345191007	Fuel and oil flow rate sensors, transmitters, and displays, including mixture controls 39/.....	8	(X)		(D)	(X)	r/	(D)
3345191009	Fuel and oil quantity sensors, transmitters, and displays, including densitometers 39/.....	7	(X)		125,733	(X)	r/	120,804
3345191011	Tachometer generators and indicators.....	9	(X)	a/	8,697	(X)	a/	7,625
3345191013	All other not specified above.....	15	(X)	a/	181,575	(X)	a/ r/	172,892
3345191015	Parts and components for aircraft engine instruments (except flight), sold separately.....	10	(X)		17,578	(X)		13,306
3345193	Physical properties testing and inspection equipment and kinematic testing and measuring equipment.....	157	(X)	a/	1,689,903	(X)		1,522,821
	Physical properties testing equipment, including hardness, tensile, stress, strain, abrasion, strength, torsion, wear, and similar testing equipment, including components and sold separately:							
3345193001	For testing of metals.....	24	(X)		394,045	(X)		364,920
3345193003	Other.....	46	(X)		363,978	(X)	a/	279,352
3345193005	Parts for physical properties testing equipment, sold separately.....	28	(X)	a/	76,381	(X)	r/	59,016
	Physical properties inspection equipment, including flaw detection, thickness measuring, and similar inspection equipment, including components and parts, sold separately:							
3345193007	For testing of metals.....	23	(X)		221,824	(X)		199,891
3345193009	Measuring and checking flow of fluids.....	12	(X)		67,976	(X)		64,714
3345193011	Other.....	40	(X)		278,017	(X)		283,134
3345193013	Parts for physical properties inspection equipment, sold separately.....	22	(X)	b/	50,429	(X)		46,121
3345193015	Kinematic testing and measuring equipment, including vibration, acceleration, and other motion testing equipment.....	30	(X)	a/	234,513	(X)		222,972
3345193017	Parts for kinematic testing and measuring equipment, sold separately.....	6	(X)	b/	2,740	(X)	b/	2,701
3345195	Nuclear radiation detection and monitoring instruments.....	54	(X)	a/	568,616	(X)	r/	529,581
3345195001	Radiation detecting elements, including ion chambers.....	18	a/	155,799	a/	68,944	a/ r/	171,221
3345195003	Solid state detectors 40/.....	5	(D)		(D)	(D)		(D)
3345195005	Nuclear monitoring instruments, including environmental, personal dosimetry, and medical monitors, both stationary and portable types.....	15	(S)	a/	165,476	(S)	r/	147,285
3345195007	Sample and flow counting systems, manual and automatic.....	8	(X)	a/	21,624	(X)		21,056
3345195009	Scalers 41/.....	6	(D)		(D)	(D)		(D)
3345195011	Special amplifiers for nuclear applications 41/.....	3	b/	8,913	6,023	b/	8,680	5,859
	Pulse analyzers, including nuclear spectrometers:							
3345195013	Single channel pulse height analyzers 42/.....	3	(D)		(D)	(D)		(D)
3345195015	Multichannel pulse height analyzers 42/.....	3	(S)		5,671	(S)		6,439
3345195017	Count rate meters.....	9	(S)		(D)	(S)		(D)
3345195019	Measurement and control devices using beta, gamma, or neutron gauge technology.....	12	(X)		113,006	(X)	r/	104,950
3345195021	Nuclear power supplies 43/.....	5	(X)		(D)	(X)		(D)
3345195023	Neutron and photon activation analysis systems.....	5	(X)		(D)	(X)		(D)

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998			1997		
			Quantity	Value	Quantity	Value		
3345195025	Nuclear instrument modules, n.e.c. 43/.....	10	(X)	37,247	(X)	35,366		
3345195027	Other nuclear radiation detection and monitoring instruments 40/.....	11	(X)	93,930	(X)	90,991		
3345195029	Parts and components for nuclear radiation detection and monitoring instruments, sold separately.....	16	(X) a/	49,751	(X) r/	41,903		
3345197	Commercial, geophysical, meteorological, and general-purpose instruments	152	(X) a/	1,423,963	(X)	1,676,701		
3345197001	Barometers and barographs, aneroid and mercurial types, including recorders, wall, pendant, meteorological, hygrothermographs, barometer-thermometer-humidity combinations.....	15	(X) b/	8,295	(X) a/ r/	7,807		
3345197003	Hydrometers, glass, all types, including thermo-hydrometers 2/.....	6	b/ 189 a/	1,753	b/ 252 b/	2,279		
3345197005	Liquid-in-glass thermometers: Engraved (etched) stem, thermoregulators, deep-sea reversing, laboratory, encased glass, ASTM standards, pocket case, max-min registering (except clinical thermometers).....	13	(X) a/	5,456	(X) a/	5,790		
3345197007	Threaded and flanged types, fixed and adjustable angle, inline and duct installations, for process, food, air-conditioning, and refrigeration installations 2/.....	12	b/ 552 b/	9,985	b/ 583 b/	10,173		
3345197009	Household and commercial thermometers such as wall, outdoor, domestic science, cupcase, filled systems, and indoor-outdoor 2/ 44/.....	12	(D)	(D)	(D)	(D)		
3391121656	Medical thermometers 2/ 44/.....	1	7,331	10,453	8,533	12,223		
3345197011	Bimetal thermometers: Threaded and flanged types, for pipeline and duct installations, including general and pocket test 2/.....	18	b/ 1,241 b/	27,398	a/ 1,392	29,823		
3345197013	Domestic science, commercial general test, indoor, outdoor, desk models, oven, refrigerator 2/.....	11	a/ 6,572 a/	17,781	6,147	17,789		
3345197015	Humidity indicating and recording instruments such as bi-hygroscopic and hygroscopic element, indicators, psychrometers, wet and dry bulb, hygrometers, indicating hygrometers.....	18	b/ 87	10,591	b/ 79 r/	9,997		
3345197017	Other thermometers (infrared, meteorological, commercial, and industrial).....	22	(X) a/	86,007	(X) b/	58,491		
3345197023	Meteorological electronics equipment and radio astronomy equipment (automatic weather stations and weather tracking equipment, ceilometers, transitoimeters, space satellite meteorological systems, and specialized meteorological telemetering equipment).....	20	(X)	192,251	(X)	244,678		
3345197025	Other meteorological instruments, including speed and direction instruments, rain gauges, thermographs, and parts, sold separately.....	15	(X)	32,592	(X) b/	44,961		
3345197027	Seismic instruments.....	12	(X) a/	281,575	(X) a/	403,357		
3345197029	All other geophysical instruments and equipment.....	18	(X) a/	234,741	(X)	298,985		
3345197031	Other commercial and industrial instruments (except aircraft), including compasses, altimeters, test equipment for hydraulic and pneumatic systems and controls, and environmental gas detectors, sold separately.....	41	(X)	483,737	(X) r/	511,368		
3345197033	Parts and accessories for meteorological and commercial and industrial instruments.....	20	(X)	21,348	(X) a/	18,980		

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 1998 and 1997
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	1998		1997	
			Quantity	Value	Quantity	Value
3345199	Surveying and drafting instruments and associated equipment.....	33	(X) b/	371,880	(X) b/	359,826
3345199001	Surveying instruments, including alidades, transits, plumb bobs, sextants, theodolites, surveyors, compasses, surveyors levels, tapes, etc.	18	(X)	321,281	(X) b/	308,682
3345199003	Parts and components for surveying instruments, sold separately.....	7	(X)	(D)	(X)	(D)
3345199005	Drafting instruments and machines, manual and automatic, drafting tables, plotting instruments, slide rules, T-squares, drafting templates, rules, etc.	13	(X) a/	25,010	(X) a/	26,863
3345199007	Parts and components for drafting instruments and machines, sold separately.....	2	(X)	(D)	(X)	(D)
3345199009	Photogrammetric and geodetic equipment, excluding cameras.....	1	(X)	(D)	(X)	(D)
3345199011	Parts and components for photogrammetric and geodetic equipment, sold separately.....	2	(X)	(D)	(X)	(D)

- Represents zero. D Withheld to avoid disclosing data for individual companies. NA Not available. n.e.c. Not specified by kind.
 r/Revised by 5 percent or more from previously published data. S Does not meet publication standards. X Not applicable.

- 1/Product codes 332911F019 and 332911F021 are combined with product code 332911F023 to avoid disclosing data for individual companies.
- 2/The quantity for this product code is in thousands of units.
- 3/Product code 332911H005 is combined with product code 332911H007 to avoid disclosing data for individual companies.
- 4/Product codes 3345111107 and 3345111113 are combined with product code 3345111115 to avoid disclosing data for individual companies.
- 5/Product code 3345111109 is combined with product code 3345111111 to avoid disclosing data for individual companies.
- 6/Product code 3345111221 is combined with product code 3345111223 to avoid disclosing data for individual companies.
- 7/Product code 3345113209 is combined with product code 3345113211 to avoid disclosing data for individual companies.
- 8/Product code 3391110111 is combined with product code 3391110113 to avoid disclosing data for individual companies.
- 9/Product code 3391110117 is combined with product code 3391110119 to avoid disclosing data for individual companies.
- 10/Product code 3391110121 is combined with product code 3391110123 to avoid disclosing data for individual companies.
- 11/Product codes 3391110127 and 3391110145 are combined with product code 3391110151 to avoid disclosing data for individual companies.
- 12/Product code 3391110231 is combined with product code 3391110233 to avoid disclosing data for individual companies.
- 13/Product code 3345120101 is combined with product code 3345120103 to avoid disclosing data for individual companies.
- 14/Product code 3345120109 is combined with product code 3345120111 to avoid disclosing data for individual companies.
- 15/Product code 3345120115 is combined with product code 3345120117 to avoid disclosing data for individual companies.
- 16/Product code 3345130115 is combined with product code 3345130117 to avoid disclosing data for individual companies.
- 17/Product code 3345130229 is combined with product code 3345130231 to avoid disclosing data for individual companies.
- 18/Product code 334513022A is combined with product code 334513022G to avoid disclosing data for individual companies.
- 19/Product code 3345141005 is combined with product code 3345141007 to avoid disclosing data for individual companies.
- 20/Product code 3345141015 is combined with product code 3345141017 to avoid disclosing data for individual companies.
- 21/Product code 3345153007 is combined with product code 3345153009 to avoid disclosing data for individual companies.
- 22/Product code 3345153017 is combined with product code 3345153019 to avoid disclosing data for individual companies.
- 23/Product code 3345153021 is combined with product code 3345153023 to avoid disclosing data for individual companies.
- 24/Product codes 3345153025 and 3345153027 are combined with product code 3345153029 to avoid disclosing data for individual companies.
- 25/Product code 3345153033 is combined with product code 3345153035 to avoid disclosing data for individual companies.
- 26/Product code 3345153067 is combined with product code 3345153069 to avoid disclosing data for individual companies.
- 27/Product code 3345153085 is combined with product code 3345153087 to avoid disclosing data for individual companies.
- 28/Product code 3345153093 is combined with product code 3345153095 to avoid disclosing data for individual companies.
- 29/Product code 3345155015 is combined with product code 3345155017 to avoid disclosing data for individual companies.
- 30/Product codes 3345155023 and 3345155025 are combined with product code 3345155027 to avoid disclosing data for individual companies.
- 31/Product code 3345155031 is combined with product code 3345155033 to avoid disclosing data for individual companies.
- 32/Product code 3345160011 is combined with product code 3345160015 to avoid disclosing data for individual companies.
- 33/Product codes 3345160017, 3345160019, and 3345160021 are combined with product code 3345160023 to avoid disclosing data for individual companies.
- 34/Product code 3345160037 is combined with product code 3345160041 to avoid disclosing data for individual companies.
- 35/Product codes 3345160051 and 3345160053 are combined with product code 3345160055 to avoid disclosing data for individual companies.
- 36/Product code 3345160061 is combined with product code 3345160065 to avoid disclosing data for individual companies.
- 37/Product code 3333143247 is combined with product code 3333143249 to avoid disclosing data for individual companies.
- 38/Product code 3345191003 is combined with product code 3345191005 to avoid disclosing data for individual companies.
- 39/Product code 3345191007 is combined with product code 3345191009 to avoid disclosing data for individual companies.
- 40/Product code 3345195003 is combined with product code 3345195027 to avoid disclosing data for individual companies.
- 41/Product code 3345195009 is combined with product code 3345195011 to avoid disclosing data for individual companies.
- 42/Product code 3345195013 is combined with product code 3345195015 to avoid disclosing data for individual companies.
- 43/Product code 3345195021 is combined with product code 3345195025 to avoid disclosing data for individual companies.
- 44/Product code 3345197009 is combined with product code 3391121656 to avoid disclosing data for individual companies.

Note: Percent of estimation of each item is indicated as follows: a/10 to 25 percent of this item has been estimated.
 b/Over 26 percent of this item has been estimated.

Table 3. Shipments, Exports and Imports of Selected Instruments and Related Products: 1998
 [Value in thousands of dollars]

Product code	Product description	Manufacturers' shipments (value of f.o.b. plant)	Exports of domestic merchandise (value at port) 1/	Imports for consumption (value) 2/ 3/
332911F001, 003, 005, 007, 009, 011, 013	Pneumatic actuated automatic valves.....	600,801	48,657	32,191
332911F015, 017, 019, 021, 023, 025, 027, 029	All other control valves including electric and electrohydraulic.....	478,922	455,790	493,879
332911F031, 033, 035, 037, 039, 041	Self-generating power actuated regulator valves.....	912,201	155,404	276,981
332911H001, 003, 005, 007, 009	Solenoid-operated valves (except nuclear and fluid transfer).....	523,403	163,078	475,301
3345111101	Compasses (magnetic and gyroscopic).....	312,228	65,383	31,220
3345111103, 105, 107, 109, 111, 113, 115, 217, 219, 221, 223, 225, 227, 229, 231, 233, 335, 437	Search, detection, aeronautical, nautical, and navigational and guidance systems, equipment, and instruments, n.e.c. (except aircraft engine instruments) 4/.....	4,394,427	736,734	313,369
3345113101, 103, 105				
3345113207, 209, 211, 313, 315, 317, 319, 321, 323	Radar systems and equipment 5/.....	4,204,465	572,172	76,582
3345113651	Radio navigational aid receivers and displays.....	847,058	357,230	244,197
3345113665	Automatic pilots.....	299,034	74,161	15,936
3345113425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 545, 547, 549, 653, 655, 657, 659, 661, 663, 667, 669, 671, 673	Sonar search, detection, tracking, and communication systems and equipment, including ASW (sonar telephone, communication equipment, depth finding, fire control, fusing guidance, hydrophones, mapping, sonabuoys, navigation, sonar fish finders, sonar finders, sonar range instrumentation, and other).....	16,793,141	100,926	138,223
3345120101, 103, 225	Temperature responsive automatic controls (thermostats).....	719,343	140,510	287,586
3345120105, 107, 109, 111, 113, 115, 117, 219, 223, 227	Pressure responsive automatic, hydraulic automatic, pneumatic automatic, and automatic control, n.e.c.	1,429,116	1,392,079	1,268,449
3345120229	Parts and components for automatic controls, sold separately.....	185,395	(NA)	(NA)
3345130	Process control instruments.....	6,657,574	491,672	437,359
3345141001, 003, 005, 007	Gas meters, consumption registering (except parts).....	204,813	27,457	4,772
3345141009, 011, 013, 015, 017	Liquid meters (except parts).....	687,088	67,420	5,559
3345141019	Parts, components, and accessories for gas and liquid meters, sold separately.....	241,467	92,513	63,863
3345143001, 003, 005, 007 3345145, 3345191, 3345155	Counting devices, n.e.c., including taxi meters and parts, parking meters and parts, aircraft engine and motor vehicle instruments.....	3,812,728	348,820	893,258
3345151	Electricity meters.....	465,750	56,341	25,297
3345153001, 003, 005	Voltage, current, and resistance measuring equipment (except multimeters).....	511,238	268,665	115,484
3345153011, 013, 015	Power and energy testing equipment.....	(D)	(NA)	(NA)
3345153071, 073	Analyzers for testing characteristics of internal-combustion engines (except aircraft).....	501,454	171,110	95,833
3345153031, 033, 035	Signal generating equipment.....	305,204	100,787	38,369

Continued

Table 3. Shipments, Exports and Imports of Selected Instruments and Related Products: 1998
 [Value in thousands of dollars]

Product code	Product description	Manufacturers' shipments (value of f.o.b. plant)	Exports of domestic merchandise (value at port) 1/	Imports for consumption (value) 2/ 3/
3345153017, 019, 021, 023, 025, 027, 029, 083, 037, 039, 043, 045, 007, 009, 047, 049, 051, 063, 065, 053, 055, 057, 059, 061, 067, 069, 075, 077, 079, 081, 085, 093, 087, 089	Test equipment for testing multimeters, electrical, radio and communication circuits, and motors, n.e.c.	9,955,647	1,068,684	305,286
3391110, 3345160	Laboratory, analytical, and scientific instruments	7,647,772	(NA)	(NA)
3333141	Sighting, tracking, and fire control equipment, optical type.....	511,998	44,957	75,012
3333143111, 113, 115	Binoculars and astronomical instruments and parts and accessories.....	89,591	95,770	259,724
3333143231, 235, 237, 239, 241, 243, 245, 247, 249	Optical instruments and lenses, n.e.c.	1,922,329	384,355	37,287
3333143233	Microscopes, optical.....	48,221	(NA)	(NA)
3345193	Physical properties testing and inspection equipment and kinematic testing and measuring equipment	1,689,903	675,582	100,567
3345195	Nuclear radiation detection and monitoring instruments and equipment.....	568,616	299,683	42,537
3391121656	Liquid-in-glass thermometers, clinical 6/.....	(D)	(D)	(D)
3345197005, 007, 009	Liquid-in-glass thermometers, n.e.c. 6/.....	25,894	11,386	20,110
3345197011, 013, 017	Thermometers (except liquid-in-glass type).....	131,186	15,657	(NA)
3345197029	Geophysical instruments and equipment.....	234,741	243,679	82,943
3345197027	Seismic instruments.....	281,575	11,787	15,277
3345197001, 015, 023, 025	Commercial, geophysical, meteorological, and general-purpose instruments, n.e.c.	243,729	123,921	118,977
3345199001, 003	Surveying instruments (except photogrammetrical and geodetic equipment).....	(D)	56,240	99,607
3345199005	Drafting instruments and machines, manual and automatic.....	25,010	14,737	218,106

D Withheld to avoid disclosing data for individual companies. NA Not available. n.e.c. Not elsewhere classified.

1/Source: Census Bureau report, EM 545, "U.S. Exports."

2/Source: Census Bureau report, IM 145, "U.S. Imports for Consumption."

3/Value represents the c.i.f. (cost, insurance, and freight) value at first port of entry in the United States plus import duties.

4/Product code 3345113105 is excluded from manufacturers' shipments to avoid disclosing data for individual companies.

5/Product codes 3345113313 and 3345113315 are excluded from manufacturers' shipments to avoid disclosing data for individual companies.

6/Products have been combined to avoid disclosing data for individual companies.

Table 4. Comparison of North American Industry Classification-Based Product Codes with Schedule B Export Numbers, and HTSUSA Import Numbers: 1998

Product code	Product description	Export number 1/	Import number 2/
332911F001, 003, 005, 007, 009, 011, 013	Pneumatic actuated automatic valves.....	8481.80.9035	8481.80.9035
332911F015, 017, 019, 021, 023, 025, 027, 029	All other control valves, including electric and electrohydraulic.....	8481.80.9020	8481.80.9020
		8481.80.9030	8481.80.9030
		8481.80.9045	8481.80.9045
		8481.80.9050	8481.80.9050
332911F031, 033, 035, 037, 039, 041	Self-generating power actuated regulator valves.....	8481.80.9015	8481.80.9015
332911H001, 003, 005, 007, 009	Solenoid-operated valves (except nuclear and fluid transfer).....	8481.80.9005	8481.80.9005
3345111101	Compasses (magnetic and gyroscopic).....	9014.10.1040	9014.10.1000
		9014.10.1080	9014.10.6000
		9014.10.6040	9014.10.7030
		9014.10.6080	9014.10.7060
		9014.10.7040	9014.10.9000
		9014.10.7080	
		9014.10.9040	
3345111103, 105, 107, 109, 111, 113, 115, 217, 219, 221, 223, 225, 227, 231, 233, 335, 437	Search, detection, aeronautical, nautical, and navigational and guidance systems, equipment, and instruments, n.e.c. (except aircraft engine instruments) 4/.....	9014.20.2000	9014.20.2000
		9014.20.6000	9014.20.6000
		9014.20.8040	9014.20.8040
		9014.20.8080	9014.20.8080
		9014.90.0000	9014.90.2040
3345113 101, 103, 105			9014.90.2080
			9014.90.6000
			9014.80.1000
3345113207, 209, 211, 313, 315, 317, 319, 321, 323	Radar systems and equipment 5/.....	8526.10.0010	8526.10.0020
		8526.10.0020	8526.10.0040
		8526.10.0070	
3345113651	Radio navigational aid receivers and displays.....	8526.91.0010	8526.91.0020
		8526.91.0030	8526.91.0040
		8526.91.0070	
3345113665	Automatic pilots.....	9014.20.4000	9014.20.4000
		9014.90.0000	9014.90.1000
3345113425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 545, 547, 653, 655, 657, 659, 661, 663, 667, 669, 671, 673	Sonar search, detection, tracking, and communication systems and equipment, including ASW (sonar telephone, communication equipment, depth finding, fire control, fusing guidance, hydrophones, mapping, sonabuys, navigation, sonar fish finders, sonar range instrumentation, and other).....	9014.80.2000	9014.80.2000
		9014.80.6000	9014.80.4000
			9014.80.5000

Table 4. Comparison of North American Industry Classification-Based Product Codes with Schedule B Export Numbers, and HTSUSA Import Numbers: 1998

Product code	Product description	Export number 1/	Import number 2/
3345120101, 103, 225	Temperature responsive automatic controls (thermostats).....	9032.10.0000	9032.10.0030 9032.10.0060 9032.10.0090
3345120105, 107, 109, 111, 113, 115, 117, 219, 223, 227	Pressure responsive automatic, hydraulic automatic, pneumatic automatic, and automatic controls, n.e.c.	9032.20.0000 9032.81.0080 9032.89.6020 9032.89.6085	9032.20.0000 9032.81.0080 9032.89.6015 9032.89.6020 9032.89.6025 9032.89.6085
3345120229	Parts and components for automatic controls, sold separately.....	9032.29.0000	9032.90.2000 9032.90.4000 9032.90.6020 9032.90.6040 9032.90.6060 9032.90.6080
3345130	Process control instruments.....	9032.81.0040 9032.81.0080 9032.89.6030 9032.89.6040 9032.89.6050 9032.89.6060 9032.89.6070 9032.89.6075	9032.81.0020 9032.81.0060 9032.89.6030 9032.89.6040 9032.89.6050 9032.89.6060 9032.89.6070 9032.89.6075
3345141001, 003, 005, 007	Gas meters, consumption registering (except parts)	9028.10.0000	9028.10.0000
3345141009, 011, 013, 015, 017	Liquid meters (except parts).....	9028.20.0000	9028.20.0000
3345141019	Parts, components, and accessories for gas and liquid meters, sold separately.....	9028.90.0080	9028.90.0080
3345143001, 003, 005, 007, 3345145, 3345155, 3345191	Counting devices, n.e.c., including taxi meters and parts, parking meters and parts, and motor vehicle instruments.....	9106.20.0000 9028.90.0040 9029.10.0000 9029.20.4040 9029.20.5000 9029.90.0000	9016.20.0000 9029.10.4000 9028.90.0040 9029.10.8000 9029.20.4040 9029.20.4080 9029.90.2000 9029.90.8040 9029.90.8080
3345151	Electricity meters.....	9028.30.0000	9028.30.0000
3345153001, 003, 005	Voltage, current, and resistance measuring equipment (except multimeters).....	9030.39.0040	9030.39.0040
3345153011, 013, 015	Power and energy testing equipment.....	9030.39.0080	9030.39.0080

Continued

Table 4. Comparison of North American Industry Classification-Based Product Codes with Schedule B Export Numbers, and HTSUSA Import Numbers: 1998

Product code	Product description	Export number 1/	Import number 2/
3345153071, 073	Analyzers for testing characteristics of internal-combustion engines (except aircraft).....	9031.80.8060 9031.80.8070	9031.80.8060 9031.80.8070
3345153031, 033, 035	Signal generating equipment.....	8543.20.0000	8543.20.0000
3345153007, 009, 017, 019, 021, 023, 025, 027, 029, 037, 039, 043, 045, 047, 049, 051, 053, 055, 057, 059, 061, 063, 065, 067, 069, 075, 077, 079, 081, 083, 085, 087, 089, 093	Test equipment for testing multimeters, electrical, radio and communication circuits, and motors, n.e.c.	9029.20.6000 9030.31.0000 9030.81.0080 9030.20.0000 9030.89.0080 9030.90.8010 9030.90.8020 9030.90.8030 9030.90.8040 9030.90.8050 9030.90.8060	9029.20.6000 9030.31.0000 9030.81.0080 9030.89.0080 9030.89.8000 9030.90.4500 9030.90.8400 9030.90.8810 9030.90.8820 9030.90.8830 9030.90.8840 9030.90.8855 9030.90.8860
3391110, 3345160	Laboratory, analytical, and scientific instruments.....	9027.50.5000 9027.50.1000 9027.20.4040 9027.20.2000 9027.20.5000 9027.20.5030 9027.20.9000 9027.30.4040 9027.30.4080 9027.80.2000 9027.80.3100 9027.80.3200 9027.80.3500 9027.80.8000 9027.90.2000 9012.10.0000	9027.50.4015 9027.50.4020 9027.20.5030 9027.20.5050 9027.20.5060 9027.20.5080 9027.20.8030 9027.20.8060 9027.20.8090 9027.30.4040 9027.30.4080 9027.50.4015 9027.50.4020 9027.80.4520 9027.80.4530 9027.80.4560 9027.80.4590 9027.90.4000 9027.90.8400 9027.90.8800 9012.10.0000 9027.80.8020 9027.80.8030 9027.80.8060 9027.80.8090
3333141	Sighting, tracking, and fire control equipment, optical type.....	9013.10.2000 9013.10.4000	9013.10.1000 9013.10.3000 9013.10.4000

Table 4. Comparison of North American Industry Classification-Based Product Codes with Schedule B Export Numbers, and HTSUSA Import Numbers: 1998

Product code	Product description	Export number 1/	Import number 2/
3333143111, 113, 115	Binoculars and astronomical instruments and parts and accessories.....	9005.10.0020	9005.10.0020
		9005.10.0040	9005.10.0040
		9005.10.0080	9005.10.0080
		9005.80.4020	9005.80.4020
		9005.80.4040	9005.80.4040
		9005.80.6000	9005.80.6000
		9005.90.0000	9005.90.4000 9005.90.8000
3333143231, 235, 237, 239, 241, 243, 245, 247, 249	Optical instruments and lenses, n.e.c.	9031.40.0080	9031.40.8080
		9031.19.0000	9031.90.4500 9031.90.5400 9031.90.5800
3333143233	Microscopes, optical.....	9011.10.0000	9011.10.4000
		9011.20.0000	9011.10.8000
		9011.80.0000	9011.20.4000
		9011.90.0000	9011.20.8000 9011.80.0000 9011.90.0000
3345193	Physical properties testing and inspection equipment and kinematic testing and measuring equipment.....	9024.10.0000	9024.10.0000
		9024.80.0000	9024.80.0000
		9024.90.0000	9024.90.0040 9024.90.0080
3345195	Nuclear radiation detection and monitoring instruments and equipment.....	9030.10.0000	9030.10.0000
		9030.90.4000	
3391121656	Liquid-in-glass thermometers, clinical 6/.....	9025.11.2000	9025.11.2000
3345197005, 007, 009	Liquid-in-glass thermometers, n.e.c. 6/.....	9025.11.4000	9025.11.4000
3345197005, 007, 009	Thermometers (except liquid-in-glass type).....	9025.19.4000	9025.19.0040
		9025.19.8040	9025.19.0080
3345197029	Geophysical instruments and equipment.....	9015.80.8040	9015.80.8040
3345197027	Seismic instruments.....	9015.80.6000	9015.80.6000
3345197001, 015, 023, 025	Commercial, geophysical, meteorological, and general-purpose instruments, n.e.c.	9025.20.0000	9025.20.4000
		9025.80.0000	9025.20.8000
		9015.80.8080	9025.80.1000 9025.80.2000 9025.80.3500 9025.80.4000 9025.80.5000 9025.90.0000 9015.80.8080

Table 4. Comparison of North American Industry Classification-Based Product Codes with Schedule B Export Numbers, and HTSUSA Import Numbers: 1998

Product code	Product description	Export number 1/	Import number 2/
3345199001, 003	Surveying instruments (except photogrammetrical and geodetic equipment).....	9015.10.0000	9015.10.4000
		9015.20.0000	9015.10.8000
		9015.30.0000	9015.20.4000
			9015.20.8000
			9015.30.4000
			9015.30.8000
			9015.90.0010
3345199005	Drafting instruments and machines, manual and automatic.....	9017.10.4000	9015.90.0020
		9017.10.8000	9015.90.0030
		9017.20.4000	9017.10.4000
		9017.20.7000	9017.10.8000
		9017.20.8080	9017.20.4000
		9017.20.8090	9017.20.7000
			9017.20.8080
	9017.20.8090		

n.e.c. Not elsewhere classified.

1/Source: 1998 edition, Harmonized System-Based Schedule B, Statistical Classification of Domestic and Foreign Commodities Exported from the United States.

2/Source: Harmonized Tariff Schedule of the United States, Annotated (1998).