

APPENDIX A

Bureau of the Census Report

**Communications Equipment, and
Other Electronic Systems and Equipment**

MA36P(90)-1, 1990

U.S. Department of Commerce
Bureau of the Census
Industry Division
Washington, DC, 20233
(303) 763-5194



Communication Equipment, and Other Electronic Systems and Equipment

U.S. Department of Commerce
Economics and Statistics Administration
BUREAU OF THE CENSUS

1990

MA36P(90)-1
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SUMMARY OF FINDINGS

During 1990, shipments of communication equipment totaled \$37,999.1 million, an increase of 3 percent from the 1989 figure of \$36,941.7 million. Telephone switching switching switchboard equipment, totaled \$7,551.0 million, an increase of 8 percent from the 1989 figure of \$6,975.5 million. Other telephone and telegraph equipment in 1990 decreased 6 percent from the 1989 figure of 3,061.8 million.

Communication systems and equipment totaled \$15,009.8 million, an increase of 7 percent over the 1989 figures of \$14,016.3 million. Alarm systems totaled \$1,019.4 million, an decrease of 10 percent from the 1989 figure of \$1,132.5 million.

A description of the survey methodology and related information appears on page 11.

Table 1. VALUE OF SHIPMENTS OF COMMUNICATION EQUIPMENT, INCLUDING TELEPHONE, TELEGRAPH, AND OTHER ELECTRONIC SYSTEMS AND EQUIPMENT, BY CLASS OF PRODUCT: 1985 TO 1990

(Millions of unadjusted dollars)

Product code	Product description	1990	1989	1988	1987	1986	1985
	Communication equipment, including telephone, telegraph, and other electronic systems and equipment.....	¹ 37,999.1	¹ 36,941.7	¹ 36,193.9	66,765.9	63,486.4	61,124.5
36611	Telephone switching and switchboard equipment.....	7,551.0	6,975.5	7,399.7	7,367.1	7,180.0	7,714.3
36613	Carrier line equipment and modems.....	4,784.7	4,705.7	^r 5,589.0	5,011.6	4,062.2	8,348.1
36614	Other telephone and telegraph equipment and components.....	2,886.5	3,061.8	^r 3,066.5	3,507.8	3,891.1	
36631	Communication systems and equipment (excluding broadcast)..	15,009.8	14,016.3	^r 12,213.0	11,692.4	11,216.5	10,708.0
36632	Broadcast, studio, and related electronic equipment.....	1,820.4	1,809.6	1,804.2	1,608.6	1,553.5	1,561.9
36691	Alarm systems.....	1,019.4	^r 1,132.5	1,164.7	1,235.0	1,028.2	1,114.3
38122	Search and detection systems and navigation and guidance systems and equipment.....	(¹)	(¹)	(¹)	30,910.9	29,503.7	27,056.8
36692	Vehicular and pedestrian, traffic control systems and electric railway systems and attachments.....	470.0	451.1	^r 387.0	426.4	446.2	455.7
36693	Intercommunication systems.....	343.6	^r 367.8	^r 392.6	282.8	195.2	172.6
36991	Electronic teaching machines, teaching aids, trainers and simulators.....	1,070.4	^r 1,359.6	^r 1,243.7	1,163.1	1,004.4	(²)
36992 pt.	Laser systems and equipment, except communication.....	885.8	915.6	^r 894.7	879.3	766.0	(²)
36995 pt.	Ultrasonic equipment.....	124.3	^r 137.7	101.3	93.5	136.5	(²)
36997 ¹	Electronic systems and equipment n.e.c.....	1,482.1	1,398.1	^r 1,446.0	1,541.5	1,670.7	3,548.8
36998 pt.	Automatic garage door openers, electronic.....	261.4	252.3	264.6	232.7	202.9	184.4
39992 pt.	Electronic games, arcade and amusement center type.....	261.1	^r 335.6	^r 192.4	258.8	180.1	159.8
39447 pt.	Electronic games, home electronic type.....	28.6	22.5	^r 34.5	39.8	31.8	99.8
38295	Meteorological and geophysical electronic equipment.....	(¹)	(¹)	(¹)	514.6	417.4	(³)

N.e.c. Not elsewhere classified. pt. Partial. ^rRevised by 5 percent or more from previously published figures.

¹Product classes 38122, "Search, detection, navigation, and guidance systems and equipment," and 38295, "commercial, geophysical, meteorological, and general purpose instruments and equipment," are now collected on Current Industrial Report Series, MA38B, Selected Instruments and Related Products. Therefore, the 1988 total shown for communication equipment is not comparable to 1987 and earlier years.

²Prior to the 1987 SIC revision, product class data for product classes 36991, 36992 and 36995 were included in product class code 36997.

³Prior to the 1987 SIC revision, product class data for product class 38295 was included in product class code 38122.

Address inquiries concerning these figures to U.S. Department of Commerce, Bureau of the Census, Industry Division, Washington, D.C. 20233, or call Indrek Grabbi, (301) 763-5194.

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Table 2. QUANTITY AND VALUE OF SHIPMENTS OF COMMUNICATION EQUIPMENT, INCLUDING TELEPHONE, TELEGRAPH, AND OTHER ELECTRONIC SYSTEMS AND EQUIPMENT, BY CLASS OF PRODUCT: 1990 AND 1989

(Quantity in 1,000 units; value in thousands of dollars)

Product code	Product description	Number of companies	1990		1989	
			Quantity	Value	Quantity	Value
3661	Telephone and telegraph apparatus.....	(NA)	(X)	15,222,220	(X)	14,743,037
36611	Telephone switching and switchboard equipment.....	(NA)	(X)	7,551,013	(X)	6,975,501
	Private branch exchange equipment.....	(NA)	(X)	915,566	(X)	909,339
	Common carrier:					
36611 21	Manual.....	-	(X)	-	(X)	-
	Automatic.....	3				
36611 24	Electromechanical.....	-				
36611 27	Electronic.....	3				
	Private carrier:					
36611 31	Manual.....	1	(X)	915,566	(X)	909,339
	Automatic.....	13				
36611 34	Electromechanical.....	2				
36611 37	Electronic.....	11				
	Telephone central office switching equipment.....	(NA)	(X)	4,652,070	(X)	4,439,159
	Local switching:					
36611 61	Manual.....	1				
36611 63	Electromechanical.....	1				
36611 65	Electronic.....	8	(X)	3,973,254	(X)	3,924,775
36611 67	Specialized switching, including video, digital, and computer controlled.....	7				
	Toll switching:					
36611 71	Manual.....	-				
36611 73	Electromechanical.....	1	(X)	493,202	(X)	374,281
36611 75	Electronic.....	3				
36611 77	Specialized switching, including video, digital, and computer controlled.....	3	(X)	185,614	(X)	140,103
36611 78	Other telephone switching and switchboard equipment n.e.c.....	38	(X)	1,861,298	(X)	1,570,657
36611 89	Parts, components, and subassemblies for telephone switching and switchboard equipment (shipped separately).....	20	(X)	122,079	(X)	56,346
36613	Carrier line equipment and modems ¹	(NA)	(X)	4,784,669	(X)	4,705,744
	Carrier line equipment (office and line repeaters and line terminating carrier equipment).....	(NA)	(X)	3,507,391	(X)	3,590,365
	Analog:					
36613 21	High-capacity.....	2	(X)	7,132	(X)	7,511
36613 22	Low-capacity.....	4				
	Digital:					
36613 23	High-capacity.....	13	(X)	530,832	(X)	405,029
36613 24	Low-capacity.....	10	(X)	127,624	(X)	111,998
	Subscriber loop carrier (terminal and line equipment):					
36613 25	Digital.....	11	(X)	562,539	(X)	648,919
36613 26	Analog.....	7	(X)	60,123	(X)	82,165
	Multiplex equipment:					
36613 30	Analog.....	9	(X)	247,999	(X)	287,475
36613 32	Digital.....	31	(X)	1,971,142	(X)	2,047,236
	Modems (data sets), including auxiliary sets ¹	(NA)		2,205,954		1,956,102
36613 72	Up to 300 b/s.....	10		4,180		8,227
36613 74	301 to 2000 b/s.....	21		286,405		357,509
36613 76	2001 to 4800 b/s.....	30		1,267,659		1,113,303
36613 78	Over 4800 b/s.....	27		647,710		477,063
36614	Other telephone and telegraph equipments and components.....	(NA)	(X)	2,886,538	(X)	3,061,792
	Telephone set.....	(NA)	(X)	223,275	(X)	345,684
36614 33	Pushbutton type (1,000 sets).....	14	(D)	98,076	(D)	200,286
36614 35	Dial type (1,000 sets).....	5				
36614 36	Cordless handset.....	-				
36614 39	Other (call directors, key sets, and special purpose).....	14		5,482		13,842
	Number of pay stations included in codes 36612 33, 36612 36, and 36612 39.....	3				
	Number of video sets included in codes 36612 33, 36612 36, and 36612 39.....	-	(D)		(D)	
	Voice frequency equipment.....	(NA)	(X)	90,847	(X)	90,177
36614 82	VF carrier telegraph.....	4	(X)	3,270	(X)	5,369
36614 84	Signaling.....	10	(X)	22,026	(X)	20,111
36614 86	Facility equipment, including subscriber loop and repeaters.....	10	(X)	65,551	(X)	64,697
36614 89	Telephone answering devices.....	8	(X)	31,227	(X)	33,888
36614 88	Telephone key systems.....	7	(X)	313,532	(X)	344,041
36614 91	Facsimile communication equipment.....	11	(X)	196,586	(X)	195,635
36614 96	Other telephone and telegraph equipment.....	80	(X)	1,516,898	(X)	1,505,487
36614 98	Parts, components, and subassemblies for other telephone and telephone and telegraph (wire) apparatus (shipped separately).....	21	(X)	514,173	(X)	546,880

See footnotes at end of table.

Table 2. QUANTITY AND VALUE OF SHIPMENTS OF COMMUNICATION EQUIPMENT, INCLUDING TELEPHONE, TELEGRAPH, AND OTHER ELECTRONIC SYSTEMS AND EQUIPMENT, BY CLASS OF PRODUCT: 1990 AND 1989—Continued

(Quantity in 1,000 units; value in thousands of dollars)

Product code	Product description	Number of companies	1990		1989	
			Quantity	Value	Quantity	Value
3663	Communication equipment.....	(NA)	(X)	16,830,168	(X)	15,825,924
36631	Communication systems and equipment, except broadcast.....	(NA)	(X)	15,009,786	(X)	14,016,318
	Transmitters, receivers, RF power amplifiers, and radio communications (point-to-point), except amateur and citizens radio, including all components whether shipped as a complete package or shipped separately.....	(NA)	(X)	2,114,822	(X)	1,976,483
36631 01	VLF and LF (below 300 kHz).....	15	(X)	89,713	(X)	127,294
36631 02	Medium and high frequency (300 kHz to 30 MHz).....	31	(X)	263,967	(X)	239,213
36631 03	VHF and UHF (to 890 MHz).....	54	(X)	1,194,229	(X)	1,010,341
36631 04	Microwave 890 to 1849 MHz.....	18	(X)	54,190	(X)	87,736
36631 05	Microwave 1850 to 3699 MHz.....	12	(X)	29,030	(X)	34,613
36631 06	Microwave 3700 to 6424 MHz.....	12	(X)	179,301	(X)	166,538
36631 07	Microwave 6425 to 7899 MHz.....	7	(X)	8,160	(X)	21,939
36631 08	Microwave 7900 MHz to 12.20 GHz.....	12	(X)	53,930	(X)	60,699
36631 09	Microwave 13.25 to 19.59 GHz.....	11	(X)	199,658	(X)	170,400
36631 11	Microwave 19.60 to 56.00 GHz.....	9	(X)	42,644	(X)	57,710
	Light communications systems and equipment electronic.....	(NA)	(X)	1,005,645	(X)	772,476
36631 13	Fiber optic systems and equipment.....	33	(X)	1,005,645	(X)	772,476
36631 14	Other light communication systems and equipment, including laser communication systems and equipment and infrared equipment.....	9				
	Carrier equipment, not elsewhere classified:					
36631 36	Voice channel multiplex for radio systems.....	13	(X)	148,687	(X)	186,621
36631 37	Power line carrier equipment.....	3				
36631 38	Space satellite communication systems.....	44	(X)	2,545,462	(X)	2,465,001
36631 39	Telemetry systems and equipment n.e.c., sold separately.....	25	(X)	204,303	(X)	221,284
	Mobile radio systems, sold as complete package, including transceivers power amplifiers, antennae, repeaters, transmitters, receivers, etc., except amateur and citizens radio equipment:					
36631 49	Airborne and marine.....	6	2,19,887	25,870	24,004	30,004
36631 51	Ground.....	15				
	Mobile base stations, transmit/receive, except amateur and citizens radio equipment:					
31 52	Air.....	2	(X)	827,747	(X)	919,277
o31 54	Marine.....	1				
36631 56	Ground.....	10				
	Mobile vehicular, transmit/receive package, except amateur and citizen radio equipment:					
36631 62	Airborne.....	4	(X)	5,727	(X)	7,508
36631 64	Marine.....	2				
	Ground:					
36631 65	300 KHz to 30 MHz.....	4	(X)	185,556	(X)	213,687
36631 67	30.00 to 72.98 MHz.....	4				
36631 66	72.99 to 150.7 MHz.....	5				
36631 68	150.8 to 174.0 MHz.....	9				
36631 71	406.0 to 512.0 MHz.....	5				
36631 72	806 MHz and higher frequencies.....	7				
	Portable receivers, transceivers, and transmitter/receivers, except amateur and citizens band:					
36631 82	Portable, including pocket size.....	17	(D)	(D)	(D)	(D)
36631 84	Pager (one way).....	9	(D)	(D)	(D)	(D)
36631 85	Parts and subassemblies for mobile, portable, and base station radios.....	21	(X)	200,735	(X)	195,327
	Transmitters and RF power amplifiers, receivers, transceivers, transmitter/receivers, etc.:					
36631 87	CB transceivers, hand-held, and other.....	3	(X)	528	(X)	546
36631 86	Amateur radio communications equipment, fixed, mobile.....	11	(X)	24,229	(X)	23,444
36631 88	Amateur equipment kits (including receivers, transceivers, transmitter-receivers, transmitters, RF power amplifiers, modulators, and citizens radios).....	2				
36631 91	Electronic checkout, monitoring, evaluation, and other electronic support equipment for communication systems.....	35	(X)	184,044	(X)	211,125
	Antenna systems, excluding structural towers, sold separately:					
36631 92	Communications antennae, below 890 MHz.....	42	10,291,465	197,192	11,084,411	198,692
36631 94	Microwave, 890 MHz and above (horns, parabolas, etc.) sold separately.....	30	260,262	351,241	247,930	312,474
36631 98	Other communication equipment, sold separately, including earphones and headsets (monaural), modulators (AM, FM, pulse), keying equipment n.e.c., electronic megaphones, communication security and cryptographic devices, remote transmitter and receiver control equipment, space and time diversity terminal equipment, and other.....	132	(X)	2,993,271	(X)	3,141,076

See footnotes at end of table.

Table 2. QUANTITY AND VALUE OF SHIPMENTS OF COMMUNICATION EQUIPMENT, INCLUDING TELEPHONE, TELEGRAPH, AND OTHER ELECTRONIC SYSTEMS AND EQUIPMENT, BY CLASS OF PRODUCT: 1990 AND 1989—Continued

(Quantity in 1,000 units; value in thousands of dollars)

Product code	Product description	Number of companies	1990		1989	
			Quantity	Value	Quantity	Value
36632 —	Broadcast, studio, and related electronic equipment.....	(NA)	(X)	1,820,382	(X)	1,809,606
	Audio equipment (excluding consumer and PA types):					
36632 12	Amplifiers and preamplifiers.....	28		395	374	207,110
36632 13	Control consoles and switchers.....	18	2	13,152	10,480	43,681
36632 17	Other audio equipment, including power supplies, terminal equipment, broadcast recorders, etc.....	28	(X)	154,559	(X)	161,786
	Video equipment (excluding consumer and PA types):					
36632 22	Amplifiers.....	8	2	36,644	35,497	49,270
36632 24	Television cameras.....	4				
36632 29	Other (power supplies, synchronization equipment, terminal equipment monitors, video tape recorders, and parts and accessories thereof, telecine chains, control consoles and switchers, film equipment, TV outside vans.....)	28	(X)	401,870	(X)	430,608
	Transmitters, translators, RF power amplifiers, and related equipment:					
36632 31	AM and FM transmitters.....	7	(X)	27,540	(X)	23,742
36632 34	TV transmitters.....	7	(X)	55,891	(X)	46,774
36632 37	Other, including broadcast transmission line equipment, phasing equipment, TV boosters and repeaters, etc.....	17	(X)	40,062	(X)	33,990
36632 39	Studio transmission links and remote pickup equipment.....	4	(X)	24,989	(X)	20,766
	Cable TV (master antennae and CATV equipment):					
36632 41	Head-end equipment (antenna baluns, carrier generators, head-end control units, single and broadband preamplifiers and strip amplifiers, converters, modulators and demodulators, splitting and mixing networks, FM processing equipment, filters and traps, power supplies, switches, etc.).....	17	(X)	106,840	(X)	113,056
36632 42	Subscriber equipment (decoders, converters and switchers, wall outlet taps, distribution amplifiers, power supplies, directional couplers, splitters, alternators, and equalizers).....	13	(X)	453,516	(X)	427,529
36632 43	Broadcasting transmitting antennae and community antennae systems...	6	(X)	11,305	(X)	11,375
36632 44	Closed circuit television systems and equipment, excluding broadcast and consumer products, including specially designed cameras, monitors video recorders, receivers, scan converters, and control consoles....	21	(X)	163,609	(X)	144,846
36632 45	Other broadcast, studio, theatre, and commercial sound equipment, sold separately, excluding studio lighting equipment and radiating and supporting towers.....	26	(X)	81,555	(X)	95,073
3669	Communications equipment n.e.c.....	(NA)	(X)	1,833,051	(X)	1,951,407
36691 —	Alarm systems.....	(NA)	(X)	1,019,400	(X)	1,132,489
	Intrusion detection:					
36691 48	Local.....	43	(X)	162,933	(X)	211,745
36691 49	Central station.....	27	(X)	250,179	(X)	239,837
36691 50	Direct connect.....	18	(X)	(D)	(X)	(D)
36691 51	Holdup systems (commercial and industrial).....	9	(X)	60,009	(X)	86,413
36691 52	Automotive.....	4	(X)	(D)	(X)	(D)
	Fire detection and prevention:					
	Smoke and heat detection alarms:					
36691 53	Ionization chamber type.....	14	(X)	159,082	(X)	147,951
36691 54	Other, including photocell type.....	19	(X)	164,436	(X)	164,453
36691 56	Central station.....	19	(X)	58,797	(X)	61,788
36691 57	Direct connect.....	14	(X)	64,541	(X)	81,062
36691 59	Other intercommunication and alarm systems, including electric sirens, and horns (vehicle, marine, industrial and air raid) security locking systems).....	4	(X)	(D)	(X)	(D)
36692 —	Vehicular and pedestrian traffic control equipment.....	(NA)	(X)	470,018	(X)	451,118
36692 42	Signal heads, including parts and accessories.....	9	(X)	32,256	(X)	30,594
36692 43	Electronic and electromechanical controllers, detectors and sensors, parts, and accessories.....	25	(X)	142,582	(X)	137,982
36692 45	Railway signals and attachments, electric railway highway grade crossing signals, exclusive of relays and other central apparatus..	5	(X)	295,180	(X)	282,542
36692 46	Other railway signal systems and safety control equipment.....	10				
36693 —	Intercommunications systems, including inductive paging systems (selective calling).....	(NA)	(X)	343,633	(X)	367,800
36693 12	Wired.....	41	(X)	289,633	(X)	311,074
36693 13	Nonwired.....	9	(X)	54,000	(X)	56,726
36693 14	AM/FM home radio intercom systems.....	5				

See footnotes at end of table.

Table 2. QUANTITY AND VALUE OF SHIPMENTS OF COMMUNICATION EQUIPMENT, INCLUDING TELEPHONE, TELEGRAPH, AND OTHER ELECTRONIC SYSTEMS AND EQUIPMENT, BY CLASS OF PRODUCT: 1990 AND 1989--Continued

(Quantity in 1,000 units; value in thousands of dollars)

Product code	Product description	Number of companies	1990		1989	
			Quantity	Value	Quantity	Value
36991 —	Electronic teaching machines, teaching aids, trainers and simulators....	(NA)	(X)	1,070,359	(X)	^r 1,359,576
36991 78	Electronic teaching machines and teaching aids.....	9	(X)	44,880	(X)	^r 56,576
36991 79	Educational electronic kits to be assembled by purchaser.....	—	(X)	—	(X)	—
36991 81	Electronic trainers and simulators*.....	35	(X)	1,025,479	(X)	^r 1,303,000
36992 —	Laser systems and equipment, except communication.....	(NA)	(X)	885,842	(X)	915,619
36992 83	Laser designator/ranging equipment.....	7	}	(X)	(X)	393,704
36992 84	Laser instrumentation (laboratory alignment devices, surveying equipment, etc.).....	14				
36992 85	Industrial laser equipment (welding, drilling, cutting, printing, wirephoto, etc.).....	16	(X)	171,088	(X)	^r 195,436
36992 87	Medical laser equipment.....	10	(X)	267,130	(X)	^r 231,986
36992 88	Laser generator, power supplies, and other laser equipment and components sold separately.....	21	(X)	94,853	(X)	94,493
36995 —	Ultrasonic equipment, (except medical).....	(NA)	(X)	124,295	(X)	^r 137,707
36995 23	Cleaners, drills, welders, and solderers.....	10	(X)	96,283	(X)	100,320
36995 26	Other ultrasonic equipment.....	7	(X)	28,012	(X)	^r 37,387
36997 —	Other electronic systems and equipment n.e.c.....	(NA)	(X)	1,482,087	(X)	1,398,118
	Amplifiers, except audio, RF power, and video, sold separately:					
36997 62	Magnetic and pulse.....	2	}	(X)	(X)	^r 17,789
36997 63	Maser.....	—				
36997 67	DC.....	8				
36997 69	Other (differential, facsimile, etc.).....	4				
36997 77	Particle accelerator electronics equipment and subassemblies for betatrons, cyclotrons, synchrotrons, etc.; linear accelerators; dynamotrons vandergraaf, traveling wave, etc.....	6	(X)	(D)	(X)	(D)
36997 81	Electronic kits to be assembled by purchaser.....	1	(X)	(D)	(X)	(D)
36997 82	Consumer electronic equipment n.e.c.*.....	17	(X)	314,814	(X)	289,468
36997 84	Scientific electronic equipment n.e.c.*.....	28	(X)	120,067	(X)	125,831
36997 86	Power supply portion of integrated TWI amplifier package.....	5	(X)	34,718	(X)	29,158
36997 88	Other electronic systems, equipment, and subassemblies n.e.c.....	101	(X)	956,583	(X)	^r 905,185
36998 04	Automatic garage door openers, electronic.....	14	(X)	261,372	(X)	252,334
	Electronic games:					
39992 22	Arcade and amusement center types (except coin-operated).....	14	(X)	261,077	(X)	^r 335,561
	Home electronic games:					
39447 12	For attachment to television receiver.....	2	}	(X)	(X)	22,537
39447 14	Other.....	3				
	Electronic research, development, test, and evaluation (receipts or billings, not reported as shipments of specific products):					
99980 42	Systems.....	20	}	(X)	(X)	^r 529,824
99980 43	Equipment and subassemblies.....	28				
99980 44	Component parts.....	15				
99980 46	Basic scientific electronic research.....	19				

Note: The percent of estimation of each item is indicated as follows (see "Description of Survey" for a discussion of estimation of missing reports): ^a10 to 25 percent of this item is estimated. ^b26 to 50 percent of this item is estimated. ^cOver 50 percent of this item is estimated.

*Similar products are collected on other Current Industrial Reports. — Represents zero. (D) Data withheld to avoid disclosing figures for individual companies. (NA) Not available. N.e.c. Not elsewhere classified. ^rRevised by 5 percent or more from previously published figures. (X) Not applicable.

¹Product class code 36613 includes data for communication interface equipment including modems which was previously collected on the MA35R, Computers and Office and Accounting Machines, under product class code 35732.

²Quantity in number of units.

Table 3. COMPARISON OF VALUES OF SHIPMENTS OF COMMUNICATION EQUIPMENT, AS REPORTED IN THE MA36P, THE 1989 ANNUAL SURVEY OF MANUFACTURES, AND THE 1987 CENSUS OF MANUFACTURES

(Value in millions of dollars)

Product code	Product description	1989			1987	
		MA36P	Annual Survey of Manufactures		MA36P	Census of Manufactures
			Value	Standard error of estimates ¹		
3661	Telephone and telegraph apparatus.....	(X)	14,679.3	1	(X)	16,528.5
36611	Telephone switching and switchboard equipment (including military)	6,975.5	6,664.3	1	7,367.1	7,561.1
36613	Carrier line equipment and modems, including auxiliary sets.....	7,767.5	4,825.5	2	5,011.6	5,091.1
36614	Other telephone and telegraph (wire) apparatus.....		2,893.5	2	3,507.8	3,548.5
36610 00	Telephone and telegraph apparatus n.s.k., typically for establishments with 20 employees or more.....	(2)	296.0	2	(2)	215.5
36610 02	Telephone and telegraph apparatus n.s.k., typically for establishments with less than 20 employees.....					
3663- --	Radio and TV communication equipment.....	(X)	16,334.5	1	(X)	13,255.9
36631 --	Communication systems and equipment.....	14,016.3	14,170.1	1	11,692.4	11,600.6
36632 --	Broadcast studio and related electronic equipment.....	1,809.6	1,996.8	3	1,608.6	1,568.8
36630 00	Radio and TV communications equipment, n.s.k., typically for establishments with 20 employees or more.....	(2)	167.6	4	(2)	13.3
36630 02	Radio and TV communications equipment, n.s.k., typically for establishments with less than 20 employees.....					
3669- --	Communications equipment, n.e.c.....	(X)	2,165.2	3	(X)	2,126.0
36691 --	Alarm systems.....	1,132.5	1,138.3	2	1,235.0	1,261.2
36692 --	Traffic control equipment.....	451.1	397.4	1	426.4	427.9
36693 --	Intercommunications equipment, except telephone and telegraph.....	367.8	371.1	8	282.8	290.3
36690 00	Communications equipment, n.e.c., n.s.k., typically for establishments with more than 20 employees.....	(2)	258.4	12	(2)	3.8
36690 02	Communications equipment, n.e.c., n.s.k., typically for establishments with less than 20 employees.....					
3699- --	Electronic and electrical equipment and supplies, n.e.c.....	(X)	6,149.2	2	(X)	5,525.1
36991 --	Electronic teaching machines, teaching aids, trainers, and simulators.....	1,359.6	1,627.3	2	1,163.1	1,210.2
36992 --	Laser systems and equipment (except communication).....	915.6	988.1	5	879.3	907.1
36995 --	Ultrasonic equipment (except medical and dental).....	137.7	97.4	1	93.5	88.0
36996 --	Apparatus wire and cordage manufactured from purchased wire.....	(X)	209.9	11	(X)	246.7
36997 --	Electronic systems and equipment, n.e.c.....	1,398.1	1,576.9	5	1,541.5	1,539.7
36998 --	Electrical products, n.e.c.....	(X)	879.3	5	(X)	787
36998 04	Automatic garage door openers.....	252.3	(X)	(X)	232.7	23
36990 00	Electronic and electrical equipment n.e.c., n.s.k., typically for establishments with 10 employees or more.....	(2)	770.1	5	(2)	540.8
36990 02	Electronic and electrical equipment n.e.c., n.s.k., typically for establishments with less than 10 employees.....					
39447 pt.	Electronic games, home electronic type.....	22.5	(X)	(X)	39.8	40.6
39992 pt.	Electronic games, arcade and amusement center type.....	335.6	(X)	(X)	258.8	274.8

N.e.c. Not elsewhere classified. N.s.k. Not specified by kind. pt. Partial (X) Not applicable.

¹The annual survey of manufactures percentage standard errors shown are the approximate relative standard errors of estimates of level. A more detailed description of the standard error of estimate is given in the introduction of the annual survey of manufactures, M89(AS)-2, Value of Product Shipments, under "Qualifications of the Data."

²Detail data available only for the census of manufactures. A substantial portion of these data are derived from administrative records. See note above.

Table 4. SHIPMENTS, IMPORTS, EXPORTS, AND APPARENT CONSUMPTION OF COMMUNICATION EQUIPMENT: 1990

(Value in thousands of dollars)

Product code	Product description	Manufacturers' shipments (value, f.o.b. plant)	Exports of domestic merchandise		Percent exports to manufacturers' shipments	Imports for consumption, value in foreign country ^{1 4}	Apparent consumption, value ³	Percent imports to apparent consumption
			Value at port ^{1 2}	Estimated producers' value ³				
36611 21-78	Telephone switching and switchboard equipment..	7,428,934	388,613	375,866	5	226,708	7,279,776	3
36611 89 36614 98	Parts, components, and subassemblies for other telephone and telegraph apparatus, including switching and switchboard apparatus.....	636,252	925,789	895,423	(NA)	819,524	5605.5 (NA)	(NA)
36613 21-32 36631 36,37	Carrier line equipment.....	3,656,078	(NA)	(NA)	(NA)	204,015	(NA)	(NA)
36614 33, 35, 39	Telephone sets except cordless handset telephones.....	223,275	194,122	187,754	84	1,664,317	1,699,838	98
36614 36	Cordless handset telephones.....							
36613 72-78	Modems, including auxiliary sets.....	1,277,278	(NA)	(NA)	(NA)	95,799	(NA)	(NA)
36614 82, 84, 86, 96	Other telephone and telegraph equipment including voice frequency equipment.....	1,607,745	(NA)	(NA)	(NA)	296,120	(NA)	(NA)
36614 88	Telephone key sets.....	313,532	(NA)	(NA)	(NA)	19,623	(NA)	(NA)
36614 89	Telephone answering devices.....	31,227	65,706	63,551	(NA)	326,128	293,804	(NA)
36614 91	Facsimile communications equipment.....	196,586	(NA)	(NA)	(NA)	827,463	(NA)	(NA)
36631 01-11	Transmitters, receivers, RF power amplifiers, radio communications (point-to-point), except amateur and citizens radio.....	2,114,822	300,251	290,403	14	76,425	1,900,844	4
36632 12	Audio amplifiers and preamplifiers, except consumer and P.A. types.....	193,119	3,068	2,967	2	7,237	197,389	4
36632 34	TV transmitters.....	55,891	(NA)	(NA)	(NA)	92,664	(NA)	(NA)
36631 38	Space satellite communications systems.....	2,545,462	56,794	54,931	2	144,464	2,634,995	5
3631 49-72, 6, 88	Mobile radio systems, base stations, and mobile vehicular transmit and receive package.....	3,058,193	905,217	875,526	29	1,072,072	3,254,739	33
36631 82	Transceivers, and portable receivers, transmitter and receivers, except amateur and citizens band.....	(D)	93,567	90,498	(NA)	176,025	(NA)	(NA)
36631 84	Pager, one way.....	(D)	67,593	65,376	(NA)	119,682	(NA)	(NA)
36631 85	Subassemblies and parts for mobile, portable and base station radios.....	200,735	1,041,832	1,007,660	(NA)	403,254	(NA)	(NA)
36631 87	CB transceivers, hand-held and other.....	528	21,561	20,854	(NA)	99,153	78,827	(NA)
36632 24	Television cameras except consumer and P.A. types.....	(D)	50,107	48,463	(NA)	2,071,349	(NA)	(NA)
36631 92 94, 36632 43	Antenna systems, including broadcast and community antennae systems.....	559,738	414,006	400,427	72	184,449	343,760	54

See footnotes at end of table.

Table 4. SHIPMENTS, IMPORTS, EXPORTS, AND APPARENT CONSUMPTION OF COMMUNICATION EQUIPMENT: 1990—Continued

(Value in thousands of dollars)

Product code	Product description	Manufacturers' shipments (value, f.o.b. plant)	Exports of domestic merchandise		Percent exports to manufacturers' shipments	Imports for consumption, value in foreign country ^{1 4}	Apparent consumption, value ⁵	Percent imports to apparent consumption
			Value at port ^{1 2}	Estimated producers' value ³				
36632 31, 41, 42, 44	Cable TV and closed circuit TV systems and equipment including AM and FM transmitters....	751,505	133,254	128,883	17	504,994	1,127,616	45
36693 12, 13, 14	Intercommunications systems, including inductive paging systems (selective calling)..	343,633	5,995	5,798	2	20,373	358,208	6
36691 48-52	Intrusion detection alarm systems.....	570,891	25,292	24,462	4	74,263	620,692	12
36691 53	Ionization heat and smoke alarm systems.....	159,082	18,189	17,592	11	27,601	169,091	16
36691 54	Other smoke and heat detection alarms including photo cell type.....	164,436	25,577	24,738	15	28,369	168,067	17
36691 56, 57	Central station and direct connect fire detection and prevention alarms.....	123,338	54,190	52,413	42	46,860	117,785	40
36692 42, 43	Vehicular and pedestrian traffic control equipment.....	174,838	35,673	34,503	20	11,277	151,612	7
36692 45, 46	Electric railway signals and attachments.....	295,180	12,996	12,570	4	3,364	285,974	1
36991 81	Electronic trainers and simulators.....	1,025,479	255,258	206,606	20	200,452	1,019,325	20
36992 85	Industrial laser equipment.....	171,088	46,117	37,327	22	47,446	181,207	26
36995 23, 26	Ultrasonic equipment except medical and dental.	124,295	11,726	9,491	8	2,651	117,455	2
36997 77	Particle accelerator electronics equipment and subassemblies.....	(D)	13,740	11,121	(NA)	(NA)	(NA)	(NA)
36998 04	Automatic garage door openers.....	261,372	64,744	52,404	20	7,139	216,107	3

(D) Data withheld to avoid disclosing figures for individual companies. (NA) Not available.

¹For comparison of SIC-based product codes, Schedule B export numbers, and HTSUSA import numbers, see table 5.²Source: Bureau of the Census report EM 545, U.S. Exports.³These values were derived by use of adjustment factors to exclude freight, insurance, and other charges incurred in moving goods to the port of export. This adjustment is made to convert the values to an approximation of the producers' value of exported goods. Current adjustment factors are based on data for 1987 which are published in Exports from Manufacturing Establishments 1987, AR 87-1, appendix B. The adjustment factor for products corresponding to industry group 366, communication equipment, is 0.9672, and industry group 369, Miscellaneous electrical equipment and supplies, is 0.8094.⁴Source: Bureau of the Census report IM 145, U.S. Imports for Consumption.⁵Apparent consumption is derived by subtracting the estimated producers' price of exports from the sum of manufacturers' shipments and imports for consumption.

Table 5. COMPARISON OF STANDARD INDUSTRIAL CLASSIFICATION-BASED PRODUCT CODES WITH SCHEDULE B EXPORT NUMBERS, AND HTSUSA IMPORT NUMBERS: 1990

Product code	Product description	Export number ¹	Import number ²																																																																									
36611 21	Telephone switching and switchboard equipment.....	8517.30.1080 8517.30.5000	8517.30.2000 8517.30.1500 8517.30.3000																																																																									
36611 24																																																																												
36611 27																																																																												
36611 31																																																																												
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36611 73																																																																												
36611 75																																																																												
36611 77																																																																												
36611 78																																																																												
36611 89	Parts, components, and subassemblies for other telephone and telegraph apparatus, including switching and switchboard apparatus.....	8517.90.2000 8517.90.5000 8517.90.9000	8517.90.0500 8517.90.1000 8517.90.1500 8517.90.2000 8517.90.3000 8517.90.3500 8517.90.4000 8517.90.5500 8517.90.6000 8517.90.7000 8517.90.8000																																																																									
36614 98				36613 21	Carrier line equipment.....	8517.40.4000 8517.40.8090	8517.40.5000 8517.40.7000	36613 22	36613 23	36613 24	36613 25	36613 26	36613 30	36613 32	36631 36	36631 37	36614 33	Telephone sets except cordless handset telephones.....	8517.10.0000 8518.30.1000	8517.10.0020 8517.10.0040 8517.10.0050 8517.10.0070 8517.10.0080 8518.30.1000	36614 35	36614 39	36614 36	Cordless handset telephones.....	8525.20.5000	8525.20.5000	36613 72	Modems, including auxiliary sets.....	8517.40.8010	8517.40.1000	36613 74	36613 78	36614 82	Other telephone and telegraph equipment including voice frequency equipment.....	(NA)	8517.81.0020 8517.82.0080 8517.30.5000	36614 84	36614 86	36614 96				36614 88	Telephone key sets.....	8517.30.1040	8517.30.2500	36614 89	Telephone answering devices.....	8520.20.0000	8520.20.0040 8520.20.0080	36614 91	Facsimile communications equipment.....	(NA)	8517.82.0040	36631 01	Transmitters, receivers, RF power amplifiers, radio communications (point-to-point), except amateur and citizens radio.....	8525.10.6010 8525.10.6030 8525.10.6050 8525.10.6070 8525.10.6090 8525.10.8020 8525.10.8040	8525.10.6020 8525.10.6040 8525.10.6060 8525.10.6080 8525.10.8000	36631 02	36631 03	36631 04	36631 05	36631 06	36631 07	36631 08	36631 09	36631 11	36632 12	Audio amplifiers and preamplifiers, except consumer and P.A. types.....	8518.40.1000	8518.40.1000	36632 34	TV transmitters.....	(NA)	8525.10.2040	36631 38
36613 21	Carrier line equipment.....	8517.40.4000 8517.40.8090	8517.40.5000 8517.40.7000																																																																									
36613 22																																																																												
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36631 37																																																																												
36614 33	Telephone sets except cordless handset telephones.....	8517.10.0000 8518.30.1000	8517.10.0020 8517.10.0040 8517.10.0050 8517.10.0070 8517.10.0080 8518.30.1000																																																																									
36614 35																																																																												
36614 39																																																																												
36614 36	Cordless handset telephones.....	8525.20.5000	8525.20.5000																																																																									
36613 72	Modems, including auxiliary sets.....	8517.40.8010	8517.40.1000																																																																									
36613 74																																																																												
36613 78																																																																												
36614 82	Other telephone and telegraph equipment including voice frequency equipment.....	(NA)	8517.81.0020 8517.82.0080 8517.30.5000																																																																									
36614 84																																																																												
36614 86																																																																												
36614 96																																																																												
36614 88	Telephone key sets.....	8517.30.1040	8517.30.2500																																																																									
36614 89	Telephone answering devices.....	8520.20.0000	8520.20.0040 8520.20.0080																																																																									
36614 91	Facsimile communications equipment.....	(NA)	8517.82.0040																																																																									
36631 01	Transmitters, receivers, RF power amplifiers, radio communications (point-to-point), except amateur and citizens radio.....	8525.10.6010 8525.10.6030 8525.10.6050 8525.10.6070 8525.10.6090 8525.10.8020 8525.10.8040	8525.10.6020 8525.10.6040 8525.10.6060 8525.10.6080 8525.10.8000																																																																									
36631 02																																																																												
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36631 09																																																																												
36631 11																																																																												
36632 12				Audio amplifiers and preamplifiers, except consumer and P.A. types.....	8518.40.1000	8518.40.1000																																																																						
36632 34	TV transmitters.....	(NA)	8525.10.2040																																																																									
36631 38	Space satellite communications systems.....	8528.10.8055	8528.10.8055																																																																									

See footnotes at end of table.

Table 5. COMPARISON OF STANDARD INDUSTRIAL CLASSIFICATION-BASED PRODUCT CODES WITH SCHEDULE B EXPORT NUMBERS, AND HTSUSA IMPORT NUMBERS: 1990—Continued

Product code	Product description	Export number ¹	Import number ²
36631 49	Mobile radio systems, base stations, and mobile vehicular transmit and receive package.....	8525.20.2000 8525.20.3040 8525.20.3042 8525.20.3045 8525.20.3055 8525.20.6000	8525.20.2000 8525.20.3040 8525.20.3070 8525.20.3080 8525.20.6020 8525.20.6060 8525.20.6070 8525.20.6080
36631 51			
36631 52			
36631 54			
36631 56			
36631 62			
36631 64			
36631 65			
36631 67			
36631 66			
36631 68			
36631 71			
36631 72			
36631 86			
36631 82	Transceivers, and portable receivers, transmitter and receivers, except amateur and citizens band.....	8525.20.3030	8525.20.3010 8525.20.3015 8525.20.3025
36631 84	Pager, one way.....	8527.90.8015 8531.80.0035	8527.90.8010 8531.80.0035
36631 85	Subassemblies and parts for mobile, portable and base station radios.....	8529.90.5000	8529.90.5000 8527.90.8020
36631 87	CB transceivers, hand-held and other.....	8527.90.8025 8525.20.1000	8525.20.0500 8527.90.8020 8525.20.1500
36632 24	Television cameras except consumer and P.A. types.....	8525.30.0015 8525.30.0060	8525.30.0010 8525.30.0030 8525.30.0040 8525.30.0060
36631 92	Antenna systems, including broadcast and community antennae systems.....	8529.10.2020 8529.10.2050 8529.10.4000 8529.10.6000	8529.10.2020 8529.10.2050 8529.10.4040 8529.10.6000
36632 43			
36631 94			
36632 31	Cable TV and closed circuit TV systems and equipment including AM and FM transmitters.....	8525.10.2000	8525.10.2020
36632 41			
36632 42			
36632 44			
36693 12	Intercommunications systems, including inductive paging systems (selective calling).....	8517.81.0010	8517.81.0010
36693 13			
36693 14			
36691 48	Intrusion detection alarm systems.....	8531.10.0035	8531.10.0035
36691 49			
36691 50			
36691 51			
36691 53	Ionization heat and smoke alarm systems.....	9022.29.4000	9022.29.4000
36691 54	Other smoke and heat detection alarms including photo cell type.....	8531.10.0015 8531.10.0025	8531.10.0015 8531.10.0025
36691 56	Central station and direct connect fire detection and prevention alarms.....	8531.10.0045	8531.10.0045
36691 57			
36692 42	Vehicular and pedestrian traffic control equipment.....	8530.80.0000 8530.90.0000	8530.80.0000 8530.90.0000
36692 43			
36692 45	Electric railway signals and attachments.....	8530.10.0000	8530.10.0000
36692 46			
36991 81	Electronic trainers and simulators.....	8805.20.0000	8805.20.0000
36992 85	Industrial laser equipment.....	8456.10.0000	8456.10.1010 8456.10.1020 8456.10.5000
36995 23	Ultrasonic equipment except medical and dental.....	8456.20.0000 8479.89.9075	8456.20.1010 8456.20.1050 8456.20.5000 8479.89.9075
36995 26			
36997 77	Particle accelerator electronics equipment and sub-assemblies.....	8543.10.0000	8543.10.0000
36998 04	Automatic garage door openers.....	8302.60.0000	8302.60.3000

(NA) Not available.

¹Source: 1990 edition, Harmonized System-Based Schedule B, Statistical Classification of Domestic and Foreign Commodities Exported from the United States.

²Source: Harmonized Tariff Schedule of the United States, Annotated (1990).