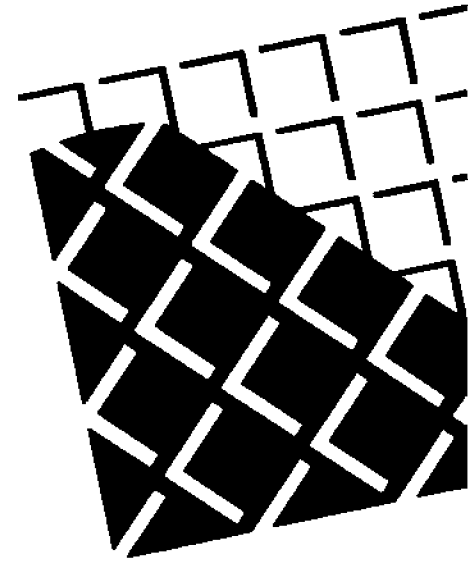


Microcontroller Historical Shipment Data

1975-1989



Dataquest

a company of
The Dun & Bradstreet Corporation

A Semiconductor Industry Service Report

Published by Dataquest Incorporated

The content of this report represents our interpretation and analysis of information generally available to the public or released by responsible individuals in the subject companies, but is not guaranteed as to accuracy or completeness. It does not contain material provided to us in confidence by our clients.

Printed in the United States of America. All rights reserved. No part of this publication may be reproduced, stored in retrieval systems, or transmitted, in any form or by any means—mechanical, electronic, photocopying, duplicating, microfilming, videotape, or otherwise—without the prior written permission of the publisher.

© 1990 Dataquest Incorporated
June 1990

Table of Contents

This booklet is divided into three major sections.

Chapter 1	4-Bit Microcontrollers.....	1
Chapter 2	8-Bit Microcontrollers.....	17
Chapter 3	16-Bit Microcontrollers.....	59

Chapter 1

4-Bit Microcontrollers

The following section includes historical 4-bit microcontroller unit shipments by year, manufacturer, product name, and process technology.

The tables are organized as follows:

Table 1	Estimated 4-Bit Microcontroller Unit Shipments by Manufacturer, 1975-1979
Table 2	Estimated 4-Bit Microcontroller Unit Shipments by Manufacturer, 1980-1984
Table 3	Estimated 4-Bit Microcontroller Unit Shipments by Manufacturer, 1985-1989
Table 4	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1975-1976
Table 5	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1977
Table 6	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1978
Table 7	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1979
Table 8	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1980
Table 9	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1981
Table 10	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1982
Table 11	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1983
Table 12	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1984
Table 13	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1985
Table 14	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1986
Table 15	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1987
Table 16	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1988
Table 17	Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1989

Table 1
**Estimated 4-Bit Microcontroller Unit Shipments by Manufacturer
 1975-1979**
 (Thousands of Units)

	Product	Process	1975	1976	1977	1978	1979
Gould/AMI	S2000	N	0	0	0	29	1,425
Hitachi	HMCS-40	P/N/C	0	0	0	410	655
Matsushita	MN1400	P/N/C	0	0	0	0	4,400
Motorola	141000	C	0	0	0	20	285
National	COPS	N/C	0	0	0	2,325	5,600
NEC	uCOM-4	P/C	0	0	0	1,500	7,800
Rockwell	PPS-4	P/N	450	450	575	2,275	3,900
Sharp	SM-3	P	0	0	0	0	360
TI	TMS1000	P/C	50	310	2,825	9,400	26,100
Total 4-Bit MCUs			500	760	3,400	15,959	50,525

Source: Dataquest (June 1990)

Table 2
Estimated 4-Bit Microcontroller Unit Shipments by Manufacturer
1980-1984
(Thousands of Units)

	Product	Process	1980	1981	1982	1983	1984
Eurotechnique	COPS	N/C	0	0	190	840	0
Fujitsu	MB884X	N	0	9,200	9,900	7,500	6,100
	MB885X	C	185	2,050	3,150	3,110	2,720
Gould/AMI	S2000	N	1,120	390	566	115	0
Hitachi	HMCS-40	P/N/C	1,425	19,000	20,600	20,600	22,400
Matsushita	MN1400	P/N/C	10,300	11,250	14,580	18,420	20,400
	MN1500	N	20	1,250	1,620	6,360	8,600
Motorola	141000	C	240	149	112	130	80
National	COPS	N/C	11,500	11,500	16,200	21,000	26,700
NEC	uCOM-4	P/C	14,800	19,800	25,700	21,000	16,930
	uPD75XXX	C	0	3,200	8,000	15,100	31,500
Oki	Series-40	C	90	550	2,450	5,480	6,400
Rockwell	PPS-4	P/N	5,800	2,500	1,675	1,800	2,135
SGS-Thomson	COPS	N	0	0	0	0	2,790
Sharp	SM-3	P	600	920	990	840	800
	SM-4	C	1,200	1,600	1,950	1,750	1,840
	SM-5	C	4,800	10,690	9,400	10,350	12,190
TI	TMS1000	P/C	44,000	39,500	26,000	11,900	8,300
Toshiba	T-Series	C	0	0	8,300	9,800	6,000
	TLCS-43	N	0	0	3,300	9,200	8,000
	TLCS-46	C	0	0	2,900	3,580	3,250
	TLCS-47	N	0	0	600	3,070	6,300
Total 4-Bit MCUs			96,080	133,549	158,183	171,945	193,435

Source: Dataquest (June 1990)

Table 3
 Estimated 4-Bit Microcontroller Unit Shipments by Manufacturer
 1985-1989
 (Thousands of Units)

	Product	Process	1985	1986	1987	1988	1989
Fujitsu	MB882XX	C	0	0	760	1,400	1,470
	MB8840X	N	0	0	1,843	1,910	2,440
	MB884X	N	5,634	6,580	7,160	6,840	7,570
	MB8850X	C	0	0	485	7,680	15,700
	MB885X	C	2,156	3,425	3,742	6,180	10,280
	MB886XX	C	0	0	0	0	300
	MB887XX	C	0	0	0	0	700
Hitachi	HMCS-40	P/N/C	22,352	21,919	25,900	18,400	14,800
	HMCS-400	C	NA	NA	32,100	28,700	43,000
Matsushita	MN1400	P/N/C	20,600	17,420	11,875	8,400	4,100
	MN1500	N	11,300	27,680	42,090	49,580	48,700
	MN1700	C	0	0	2,085	4,700	7,000
Mitsubishi	M5043X/44X	C	0	0	13,995	13,200	18,000
	M5046X/56X	C	0	0	13,105	19,800	32,500
	M5072/76	C	0	0	15,054	14,100	19,000
	M509X	C	0	0	2,056	6,430	13,000
	M50XXX	C	0	27,844	0	0	0
Motorola	141000	C	4	0	0	0	0
National	COP400	N/C	23,500	31,273	31,970	30,450	33,400
NEC	uCOM-4	P/C	9,920	5,700	3,680	6,450	6,300
	uPD75XX	N/C	0	3,900	16,810	17,850	19,500
	uPD75XXX	C	31,590	41,920	47,670	63,600	85,500
Oki	Series-40	C	6,614	7,217	6,689	7,580	9,800
Rockwell	PPS-4	P	1,400	1,160	790	325	235
Sanyo	LC65/66XX	C	0	0	0	31,000	70,000
	LM64XX	N	0	0	0	400	550
SGS-Thomson	COPS	N	5,242	6,330	7,515	8,850	7,645
Sharp	SM-Series ¹	C	10,370	9,140	9,510	21,750	36,100
	Custom	C	0	0	0	9,000	44,000
Sony	SPC500	C	0	0	0	8,500	23,000
TI	TMS1000	P/C	3,900	16,025	13,400	9,300	10,400
Toshiba	T-Series	C	5,580	4,600	6,265	14,050	15,200
	TLCS-42	N/C	1,250	3,850	4,060	4,650	6,600
	TLCS-43	N	5,672	2,600	2,209	4,650	890
	TLCS-46	C	2,198	400	202	480	230
	TLCS-47	N	7,756	7,200	5,935	9,890	2,050
	TLCS-47	C	0	15,300	17,497	32,250	41,500
	TLCS-470	C	0	400	1,360	100	21,400
Total 4-Bit MCUs			177,038	261,883	347,812	468,445	672,860

Note: Totals for 1986, 1987, and 1988 have been adjusted to remove Dataquest's previous estimate for unsurveyed companies. Totals now reflect actual survey results. Additionally, because of the receipt of new information, 1988 numbers have been restated for many Japanese companies.

¹Sharp SM-Series totaled in 1985.

NA = Not available

Source: Dataquest (June 1990)

Table 4
Estimated 4-Bit Microcontroller Unit Shipments by Quarter
1975-1976
(Thousands of Units)

	Product	Process	1975	Q1/76	Q2/76	Q3/76	Q4/76	1976
Rockwell	PPS-4	P	450	100	110	120	120	450
TI	TMS1000	P/C	50	60	75	75	100	310
Total 4-Bit MCUs			500	160	185	195	220	760

Source: Dataquest (June 1990)

Table 5
Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1977
(Thousands of Units)

	Product	Process	Q1/77	Q2/77	Q3/77	Q4/77	1977
Rockwell	PPS-4	P	145	145	140	145	575
TI	TMS1000	P/C	225	400	1,000	1,200	2,825
Total 4-Bit MCUs			370	545	1,140	1,345	3,400

Source: Dataquest (June 1990)

Table 6
Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1978
(Thousands of Units)

	Product	Process	Q1/78	Q2/78	Q3/78	Q4/78	1978
Gould	S2000	N	0	9	8	12	29
Hitachi	HMCS-40	P/N/C	85	95	110	120	410
Motorola	141000	C	0	0	5	15	20
National	COPS	C/N	300	500	675	850	2,325
NEC	UCOM-4	P/C	150	225	525	600	1,500
Rockwell	PPS-4	P	400	550	675	650	2,275
TI	TMS1000	P/C	1,400	1,800	3,000	3,200	9,400
Total 4-Bit MCUs			2,335	3,179	4,998	5,447	15,959

Source: Dataquest (June 1990)

Table 7

Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1979
(Thousands of Units)

	Product	Process	Q1/79	Q2/79	Q3/79	Q4/79	1979
Gould	S2000	N	50	300	675	400	1,425
Hitachi	HMCS-40	P/N/C	130	150	175	200	655
Matsushita	MN1400	P/N/C	500	800	1,400	1,700	4,400
Motorola	141000	C	30	75	90	90	285
National	COPS	C/N	900	1,100	1,500	2,100	5,600
NEC	UCOM-4	P/C	1,100	1,300	2,300	3,100	7,800
Rockwell	PPS-4	P	600	1,100	1,100	1,100	3,900
Sharp	SM-3	P	1	1	1	1	360
TI	TMS1000	P/C	4,200	5,400	7,500	9,000	26,100
Total 4-Bit MCUs			7,510	10,225	14,740	17,690	50,525

¹No quarterly data available for Sharp SM-3.
Source: Dataquest (June 1990)

Table 8

Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1980
(Thousands of Units)

	Product	Process	Q1/80	Q2/80	Q3/80	Q4/80	1980
Fujitsu	8850	C	10	25	50	100	185
Gould	S2000	N	180	340	490	110	1,120
Hitachi	HMCS-40	P/N/C	225	300	400	500	1,425
Matsushita	MN1400	P/N/C	2,200	3,000	3,000	2,100	10,300
	MN1500	N	0	0	S	20	20
Motorola	141000	C	70	50	60	60	240
National	COPS	C/N	2,700	3,200	2,800	2,800	11,500
NEC	UCOM-4	P/C	3,300	4,200	4,000	3,300	14,800
Oki	Series-40	C	10	15	25	40	90
Rockwell	PPS-4	P	1,400	1,700	1,700	1,000	5,800
Sharp	SM-3	P	120	140	160	180	600
	SM-4	C	250	280	320	350	1,200
	SM-5	C	490	800	1,550	1,960	4,800
TI	TMS1000	P/C	11,000	12,500	10,000	10,500	44,000
Total 4-Bit MCUs			21,955	26,550	24,555	23,020	96,080

S = Sampled
Source: Dataquest (June 1990)

Table 9

Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1981
(Thousands of Units)

	Product	Process	Q1/81	Q2/81	Q3/81	Q4/81	1981
Eurotech.	COP	C/N	0	0	0	S	S
Fujitsu	884X	N	1,600	2,300	2,500	2,800	9,200
	8850	C	200	500	600	750	2,050
Gould	S2000	N	100	100	100	90	390
Hitachi	HMCS-40	P/N/C	3,000	4,400	6,000	5,600	19,000
Matsushita	MN1400	P/N/C	2,340	2,610	3,240	3,060	11,250
	MN1500	N	260	290	360	340	1,250
Motorola	141000	C	40	80	10	19	149
National	COPS	C/N	2,500	2,600	3,000	3,400	11,500
NEC	UCOM-4	P/C	4,000	5,100	4,900	5,800	19,800
	uPD-75XXX	C	0	0	1,500	1,700	3,200
Oki	Series-40	C	75	120	155	200	550
Rockwell	PPS-4	P	900	700	500	400	2,500
Sharp	SM-3	P	200	230	250	240	920
	SM-4	C	380	400	420	400	1,600
	SM-5	C	2,490	2,800	2,800	2,600	10,690
TI	TMS1000	P/C	10,000	10,000	10,500	9,000	39,500
Total 4-Bit MCUs			28,085	32,230	36,835	36,399	133,549

S = Sampled

Source: Dataquest (June 1990)

Table 10

Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1982
(Thousands of Units)

	Product	Process	Q1/82	Q2/82	Q3/82	Q4/82	1982
Eurotech.	COP	C/N	S	S	80	110	190
Fujitsu	884X	N	2,800	2,500	2,300	2,300	9,900
	8850	C	800	800	750	800	3,150
Gould	S2000	N	100	200	185	81	566
Hitachi	HMCS-40	P/N/C	6,000	5,600	4,600	4,400	20,600
Matsushita	MN1400	P/N/C	3,420	3,730	3,830	3,600	14,580
	MN1500	N	380	410	420	410	1,620
Motorola	141000	C	20	28	25	39	112
National	COPS	C/N	3,000	3,500	4,700	5,000	16,200
NEC	UCOM-4	P/C	6,000	7,200	7,000	5,000	25,700
	uPD75XXX	C	1,800	1,800	2,200	2,200	8,000
Oki	Series-40	C	250	420	830	950	2,450
Rockwell	PPS-4	P	425	350	500	400	1,675
Sharp	SM-3	P	250	260	240	240	990
	SM-4	C	500	550	450	450	1,950
	SM-5	C	2,500	2,500	2,200	2,200	9,400
TI	TMS1000	P/C	8,000	7,000	6,000	5,000	26,000
Toshiba	T-Series	C	1,200	2,000	2,500	2,600	8,300
	TLCS-43	N	500	600	700	1,500	3,300
	TLCS-46	C	500	600	1,100	700	2,900
	TLCS-47	C/N	50	100	250	200	600
Total 4-Bit MCUs			38,995	40,148	40,860	38,180	158,183

S = Sampled

Source: Dataquest (June 1990)

Table 11
Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1983
(Thousands of Units)

	Product	Process	Q1/83	Q2/83	Q3/83	Q4/83	1983
Eurotech.	COP	C/N	130	160	250	300	840
Fujitsu	884X	N	2,100	1,900	1,750	1,750	7,500
	8850	C	775	775	780	780	3,110
Gould	S2000	N	40	40	30	5	115
Hitachi	HMCS-40	P/N/C	4,800	4,800	5,400	5,600	20,600
Matsushita	MN1400	P/N/C	4,100	4,480	4,940	4,900	18,420
	MN1500	N	710	1,500	2,100	2,050	6,360
Motorola	141000	C	35	36	36	23	130
National	COPS	C/N	4,500	5,500	5,500	5,500	21,000
NEC	UCOM-4	P/C	5,000	5,000	5,500	5,500	21,000
	uPD75XXX	C	2,500	2,900	4,500	5,200	15,100
Oki	Series-40	C	1,100	1,380	1,500	1,500	5,480
Rockwell	PPS-4	P	350	550	600	300	1,800
Sharp	SM-3	P	220	220	200	200	840
	SM-4	C	425	450	425	450	1,750
	SM-5	C	2,400	2,500	2,650	2,800	10,350
TI	TMS1000	P/C	4,000	3,000	2,500	2,400	11,900
Toshiba	T-Series	C	3,100	2,400	2,500	1,800	9,800
	TLCS-43	N	2,200	2,200	2,400	2,400	9,200
	TLCS-46	C	800	800	1,000	980	3,580
	TLCS-47	C/N	350	600	800	1,320	3,070
Total 4-Bit MCUs			39,635	41,191	45,361	45,758	171,945

Source: Dataquest (June 1990)

Table 12

Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1984
(Thousands of Units)

	Product	Process	Q1/84	Q2/84	Q3/84	Q4/84	1984
Fujitsu	884X	N	1,600	1,500	1,500	1,500	6,100
	8850	C	770	750	650	550	2,720
Hitachi	HMCS-40	P/N/C	5,600	5,600	5,600	5,600	22,400
Matsushita	MN1400	P/N/C	5,200	5,200	5,000	5,000	20,400
	MN1500	N	2,100	2,300	2,100	2,100	8,600
Motorola	141000	C	40	24	11	5	80
National	COPS	C/N	6,100	6,100	8,000	6,500	26,700
NEC	UCOM-4	P/C	4,910	4,340	3,840	3,840	16,930
	uPD75XXX	C	5,510	7,570	9,210	9,210	31,500
Okidata	Series-40	C	1,600	1,600	1,600	1,600	6,400
Rockwell	PPS-4	P	415	370	600	750	2,135
Sharp	SM-3	P	200	200	200	200	800
	SM-4	C	460	460	460	460	1,840
	SM-5	C	3,000	3,190	3,000	3,000	12,190
TI	TMS1000	P/C	2,200	2,100	2,000	2,000	8,300
Thomson	COPS	C/N	300	560	730	1,200	2,790
Toshiba	T-Series	C	1,400	1,500	1,600	1,500	6,000
	TLCS-43	N	2,400	2,400	1,600	1,600	8,000
	TLCS-46	C	1,000	1,000	600	650	3,250
	TLCS-47	C/N	1,400	1,400	1,700	1,800	6,300
Total 4-Bit MCUs			46,205	48,164	50,001	49,065	193,435

Source: Dataquest (June 1990)

Table 13

Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1985
(Thousands of Units)

	Product	Process	Q1/85	Q2/85	Q3/85	Q4/85	1985
Fujitsu	884X	N	1,450	1,392	1,392	1,400	5,634
	8850	C	550	528	528	550	2,156
Hitachi	HMCS-40	P/N/C	5,600	5,376	5,376	6,000	22,352
Matsushita	MN1400	P/N/C	5,000	4,800	4,800	6,000	20,600
	MN1500	N	2,100	2,100	2,800	4,300	11,300
Motorola	141000	C	4	0	0	0	4
National	COPS	C/N	6,500	6,000	5,800	5,200	23,500
NEC	UCOM-4	P/C	3,250	2,730	2,330	1,610	9,920
	uPD75XXX	C	7,180	8,170	8,550	7,690	31,590
Oki	Series-40	C	1,700	1,632	1,632	1,650	6,614
Rockwell	PPS-4	P	400	300	360	340	1,400
Sharp	SM-Series	C	2,490	2,490	2,695	2,695	10,370
TI	TMS1000	P/C	1,000	950	950	1,000	3,900
Thomson	COPS	C/N	1,350	1,296	1,296	1,300	5,242
Toshiba	T-Series	C	1,500	1,440	1,440	1,200	5,580
	TLCS-42	N/C	0	0	350	900	1,250
	TLCS-43	N	1,600	1,536	1,536	1,000	5,672
	TLCS-46	C	650	624	624	300	2,198
	TLCS-47	C/N	1,800	1,728	1,728	2,500	7,756
Total 4-Bit MCUs			44,124	43,092	44,187	45,635	177,038

Source: Dataquest (June 1990)

Table 14

Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1986
(Thousands of Units)

	Product	Process	Q1/86	Q2/86	Q3/86	Q4/86	1986
Fujitsu	884X	N	1,535	1,620	1,680	1,745	6,580
	885X	C	720	860	900	945	3,425
Hitachi	HMCS-40	P/N/C	6,010	5,500	5,174	5,235	21,919
Matsushita	MN1400	P/N/C	4,500	4,000	4,600	4,320	17,420
	MN1500	N	5,700	7,100	7,480	7,400	27,680
Mitsubishi	50XXX	C	5,994	7,450	6,500	7,900	27,844
National	COPS	C/N	5,950	6,928	8,435	9,960	31,273
NEC	UCOM-4	P/C	1,500	1,250	1,570	1,380	5,700
	uPD75XX	C	0	0	1,750	2,150	3,900
	uPD75XXX	C	8,470	10,420	11,920	11,110	41,920
Oki	Series-40	C	1,860	1,900	1,820	1,637	7,217
Rockwell	PPS-4	P	400	300	210	250	1,160
Sharp	SM-Series	C	2,700	2,030	2,150	2,260	9,140
TI	TMS1000	P/C	4,000	4,170	3,845	4,010	16,025
Thomson	COPS	C/N	1,405	1,450	1,675	1,800	6,330
Toshiba	T-Series	C	900	1,100	1,200	1,400	4,600
	TLCS-42	N/C	850	1,000	1,000	1,000	3,850
	TLCS-43	N	700	850	650	400	2,600
	TLCS-46	C	200	100	50	50	400
	TLCS-47	C/N	4,400	5,200	6,700	6,200	22,500
	TLCS-470	C	0	0	100	300	400
Total 4-Bit MCUs			57,794	63,228	69,409	71,452	261,883

Source: Dataquest (June 1990)

Table 15
Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1987
(Thousands of Units)

	Product	Process	Q1/87	Q2/87	Q3/87	Q4/87	1987
Fujitsu	882XX	C	120	150	225	265	760
	884X	N	1,705	1,765	1,800	1,890	7,160
	884XX	N	410	450	478	505	1,843
	885X	C	882	905	940	1,015	3,742
	885XX	C	100	110	125	150	485
Hitachi	HMCS-40	P/N/C	6,300	6,405	6,520	6,675	25,900
	HMCS-400	C	7,600	8,000	8,000	8,500	32,100
Matsushita	MN1400	P/N/C	4,500	3,500	1,885	1,990	11,875
	MN1500	N	7,250	11,000	11,600	12,240	42,090
	MN1700	C	0	0	1,015	1,070	2,085
Mitsubishi	M5043X/44X	C	3,393	3,294	3,767	3,541	13,995
	M5046X/56X	C	2,141	3,213	3,996	3,755	13,105
	M5072/76	C	2,701	2,908	4,337	5,108	15,054
	M509X	C	156	152	727	1,021	2,056
National	COPS	N/C	8,770	8,500	8,200	6,500	31,970
NEC	uCOM-4	P/C	970	110	1,300	1,300	3,680
	uPD75XX	N/C	3,500	4,610	5,000	3,700	16,810
	uPD75XXX	C	11,000	10,970	13,500	12,200	47,670
Oki	Series-40	C	1,650	1,584	1,740	1,715	6,689
Rockwell	PPS-4	P/N	185	155	150	300	790
Sharp	SM-Series	C	2,170	1,820	2,170	3,350	9,510
TI	TMS1000	P/C	4,400	4,500	2,900	1,600	13,400
SGS-Thomson	COPS	N	1,810	1,880	1,925	1,900	7,515
Toshiba	T-Series	C	1,600	1,460	1,580	1,625	6,265
	TLCS-42	N/C	1,000	1,100	980	980	4,060
	TLCS-43	N	550	560	574	525	2,209
	TLCS-46	C	50	62	48	42	202
	TLCS-47	N	1,600	1,500	1,475	1,360	5,935
	TLCS-47	C	4,300	4,220	4,405	4,572	17,497
	TLCS-470	C	300	340	350	370	1,360
Total 4-Bit MCUs			81,113	85,223	91,712	89,764	347,812

Source: Dataquest (June 1990)

Table 16

Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1988
(Thousands of Units)

	Product	Process	Q1/88	Q2/88	Q3/88	Q4/88	1988
Fujitsu	MB882XX	C	320	350	380	350	1,400
	MB8840X	N	400	450	500	560	1,910
	MB884X	N	1,640	1,650	1,750	1,800	6,840
	MB8850X	C	700	900	2,880	3,200	7,680
	MB885X	C	900	900	2,000	2,380	6,180
Hitachi	HMCS-40	P/N/C	5,000	5,000	4,100	4,300	18,400
	HMCS-400	C	6,000	6,000	8,200	8,500	28,700
Matsushita	MN1400	P/N/C	2,100	2,200	2,000	2,100	8,400
	MN1500	N	12,180	13,370	11,730	12,300	49,580
	MN1700	C	1,100	1,300	1,100	1,200	4,700
Mitsubishi	M5043X/44X	C	3,000	3,500	3,300	3,400	13,200
	M5046X/56X	C	4,900	5,300	5,600	4,000	19,800
	M5072/76	C	2,900	3,300	4,100	3,800	14,100
	M509X	C	530	1,600	2,100	2,200	6,430
National	COP400	N/C	7,550	7,500	7,300	8,100	30,450
NEC	uCOM-4	P/C	2,700	1,350	1,300	1,100	6,450
	uPD75XX	N/C	4,050	4,350	4,750	4,700	17,850
	uPD75XXX	C	13,050	14,750	18,200	17,600	63,600
Oki	Series-40	C	1,600	1,680	2,000	2,300	7,580
Rockwell	PPS-4	P	150	70	55	50	325
Sanyo	LC65/66XX	C	0	0	15,000	16,000	31,000
	LM64XX	N	0	0	200	200	400
SGS-Thomson	COPS	N	1,743	2,427	2,457	2,223	8,850
Sharp	CUSTOM	C	0	0	4,000	5,000	9,000
	SM-Series	C	3,750	4,300	5,100	8,600	21,750
Sony	SPC500	C	0	0	4,000	4,500	8,500
TI	TMS1000	P/C	1,700	2,300	2,100	3,200	9,300
Toshiba	T-Series	C	3,400	3,500	3,550	3,600	14,050
	TLCS-42	N/C	1,000	1,150	1,200	1,300	4,650
	TLCS-43	N	1,000	1,150	1,200	1,300	4,650
	TLCS-46	C	150	130	100	100	480
	TLCS-47	N	2,140	2,210	2,580	2,960	9,890
	TLCS-47	C	7,200	8,190	8,410	8,450	32,250
	TLCS-470	C	0	0	0	100	100
Total 4-Bit MCUs			92,853	100,877	133,242	141,473	468,445

Source: Dataquest (June 1990)

Table 17

Estimated 4-Bit Microcontroller Unit Shipments by Quarter for 1989
(Thousands of Units)

	Product	Process	Q1/89	Q2/89	Q3/89	Q4/89	1989
Fujitsu	M8886XX	C	0	0	100	200	300
	M8887XX	C	0	100	200	400	700
	MB882XX	C	360	365	370	375	1,470
	MB8840X	N	580	600	620	640	2,440
	MB884X	N	1,830	1,875	1,915	1,950	7,570
	MB8850X	C	3,520	3,680	4,000	4,500	15,700
	MB885X	C	2,400	2,480	2,600	2,800	10,280
Hitachi	HMCS-40	P/N/C	4,300	4,000	3,500	3,000	14,800
	HMCS-400	C	9,000	10,000	11,500	12,500	43,000
Matsushita	MN1400	P/N/C	2,000	2,100	0	0	4,100
	MN1500	N	10,700	12,000	14,000	12,000	48,700
	MN1700	C	1,600	1,700	1,800	1,900	7,000
Mitsubishi	M5043X/44X	C	4,500	4,500	4,500	4,500	18,000
	M5046X/56X	C	6,500	8,000	9,000	9,000	32,500
	M5072/76	C	4,500	4,000	5,500	5,000	19,000
	M509X	C	3,000	3,000	3,500	3,500	13,000
National	COP400	N/C	7,600	8,400	7,400	10,000	33,400
NEC	uCOM-4	P/C	1,500	1,600	1,600	1,600	6,300
	uPD75XX	C	4,800	4,900	4,900	4,900	19,500
	uPD75XXX	N/C	19,500	21,000	23,000	22,000	85,500
Oki	Series-40	C	2,300	2,400	2,400	2,700	9,800
Rockwell	PPS-4	P	90	90	15	40	235
Sanyo	LC65/66XX	C	17,000	17,500	17,500	18,000	70,000
	LM64XX	N	200	150	100	100	550
SGS-Thomson	COPS	N	2,173	2,010	1,855	1,607	7,645
Sharp	CUSTOM	C	11,000	12,000	10,000	11,000	44,000
	SM-Series	C	8,900	9,500	8,900	8,800	36,100
Sony	SPC500	C	5,300	5,800	6,000	5,900	23,000
TI	TMS1000	P/C	3,300	2,600	2,000	2,500	10,400
Toshiba	T-Series	C	4,800	4,000	3,600	2,800	15,200
	TLCS-42	N/C	1,600	1,300	1,800	1,900	6,600
	TLCS-43	N	170	100	120	500	890
	TLCS-46	C	150	30	30	20	230
	TLCS-47	N	650	300	600	500	2,050
	TLCS-47	C	9,000	10,500	11,000	11,000	41,500
	TLCS-470	C	3,900	5,000	6,000	6,500	21,400
Total 4-Bit MCUs			158,723	167,580	171,925	174,632	672,860

Source: Dataquest (June 1990)

Chapter 2

8-Bit Microcontrollers

The following section includes historical 8-bit microcontroller unit shipments by year, manufacturer, product name, and process technology.

The tables are organized as follows:

Table 1	Estimated 8-Bit Microcontroller Unit Shipments by Manufacturer, 1975-1979
Table 2	Estimated 8-Bit Microcontroller Unit Shipments by Manufacturer, 1980-1984
Table 3	Estimated 8-Bit Microcontroller Unit Shipments by Manufacturer, 1985-1989
Table 4	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1975-1976
Table 5	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1977
Table 6	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1978
Table 7	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1979
Table 8	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1980
Table 9	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1981
Table 10	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1982
Table 11	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1983
Table 12	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1984
Table 13	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1985
Table 14	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1986
Table 15	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1987
Table 16	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1988
Table 17	Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1989

Table 1

**Estimated 8-Bit Microcontroller Unit Shipments by Manufacturer
1975-1979
(Thousands of Units)**

	Product	Process	1975	1976	1977	1978	1979
AMD	8048	N	0	0	0	0	23
Fairchild	387X	N	0	0	15	23	510
	F8	N	27	181	655	630	650
General Instrument	PIC1650	N	0	0	0	450	4,100
Intel	802X	N	0	0	0	0	160
	8048/35	N	0	0	105	480	1,950
	8049/39	N	0	0	0	10	210
	8748	N	0	0	0	30	300
Mostek	387X	N	0	0	20	350	1,470
	F8	N	5	70	90	160	470
Motorola	387X	N	0	0	0	70	500
	6801/03	N	0	0	0	0	13
	6805	N	0	0	0	0	3
National	8049/39	N	0	0	0	0	10
NEC	8048/35	N	0	0	0	15	735
	8049/39	N	0	0	0	0	250
Rockwell	6500/XX	N	0	0	0	0	8
SGS	387X	N	0	0	0	0	50
Signetics	8048/35	N	0	0	0	0	180
Total 8-Bit MCUs			32	251	885	2,218	11,592

Source: Dataquest (June 1990)

Table 2
Estimated 8-Bit Microcontroller Unit Shipments by Manufacturer
1980-1984
(Thousands of Units)

	Product	Process	1980	1981	1982	1983	1984
AMD	8048	N	138	240	320	190	40
	8049	N	0	35	105	110	10
	8051	N	0	0	0	376	2,260
AMI	6801/03	N	0	0	0	220	1,080
	6805	N	0	0	60	120	540
Eurotechnique	8048/35	N	0	0	9	16	0
	8049/39	N	0	0	36	95	0
	8050/40	N	0	0	121	225	0
Fairchild	387X	N	1,795	3,100	1,750	1,370	1,075
	F8	N	620	745	845	680	74
Fujitsu	MBL8048/35	N	150	400	335	350	425
	MBL8049/39	N	300	925	1,080	1,325	1,510
General Instrument	PIC1652/54	N	0	0	0	1,017	1,650
	PIC1655/57	N	0	0	0	2,854	4,305
	PIC165X	N	5,600	4,125	4,200	0	0
	PIC1670/72	N	0	0	0	2,111	2,975
	PIC16C58	C	0	0	0	638	475
	PIC7000/1	N	0	0	0	0	10
	PIC7020/40	N	0	0	0	0	57
Hitachi	PIC7041	N	0	0	0	0	13
	6301	C	0	0	210	722	1,472
	6305	C	0	0	140	540	950
	6801/03	N	0	190	635	1,035	1,902
	6805	N	0	300	825	1,420	2,766
Intel	802X	N	810	1,525	2,050	1,395	1,050
	8048/35	N	3,750	4,800	5,200	5,250	3,825
	8049/39	N	715	1,230	1,870	2,085	2,960
	8050/40	N	0	0	0	300	490
	8051/31	N	0	25	460	3,530	12,900
	8052/32	N	0	0	0	37	213
	80C48/35	C	0	0	0	18	10
	80C49/39	C	0	0	0	140	230
	80C51/31	C	0	0	0	140	265
	8748	N	650	775	1,530	2,065	2,500
	8749	N	0	3	450	960	2,030
Intersil	8751	N	0	4	70	320	795
	80C48/35	C	0	0	0	0	44

(Continued)

Table 2 (Continued)

**Estimated 8-Bit Microcontroller Unit Shipments by Manufacturer
1980-1984
(Thousands of Units)**

	Product	Process	1980	1981	1982	1983	1984	
Matra-Harris	8048	N	0	0	6	48	130	
	8051	N	0	0	0	0	635	
	80C48	C	0	0	0	0	20	
Matsushita	MN1800	C	0	0	17	28	40	
Mostek	387X	N	2,105	2,485	2,030	1,660	1,425	
	38P7X	N	0	0	0	0	148	
	F8	N	205	110	33	190	195	
Motorola	146805	C	0	95	635	1,886	4,389	
	1468705	C	0	0	0	5	34	
	387X	N	635	700	425	126	60	
	6801/03	N	195	1,655	3,320	7,111	7,920	
	6804	N	0	0	0	0	36	
	6805	N	460	2,335	4,775	6,934	8,332	
	68701	N	0	33	78	364	199	
	68705	N	0	64	262	584	1,904	
	68HC11	C	0	0	0	0	3	
National	8048/35	N	45	460	995	1,450	2,775	
	8049/39	N	175	710	1,125	1,290	2,190	
	8050/40	N	50	405	880	1,270	1,940	
	807X	N	31	70	53	60	35	
	80C48/35	C	0	0	60	245	40	
NCR	6500/1/11	N	0	0	0	215	600	
NEC	8021/22	N	10	140	200	245	470	
	8041	N	0	0	0	0	2,220	
	8048/35	N	1,990	1,900	2,440	3,360	7,750	
	8049/39	N	920	2,125	4,200	5,950	7,210	
	80C48/35	C	0	0	230	940	2,020	
	80C49/39	C	0	0	151	650	1,770	
	8741	N	0	0	0	0	380	
	8748	N	0	195	510	1,090	2,050	
	8749	N	0	0	29	255	1,010	
	uPD78XX	N	0	490	2,050	4,960	11,780	
	Oki	80C48/35	C	0	0	25	203	450
		80C49/39	C	0	0	135	827	1,960
	Philips	8021/22	N	0	120	280	360	650
		8048/35	N	19	250	810	940	3,110
		8049/39	N	0	0	95	320	2,930
8050/40		N	0	0	0	0	10	
8051/31		N	0	0	0	40	1,160	

(Continued)

Table 2 (Continued)
Estimated 8-Bit Microcontroller Unit Shipments by Manufacturer
1980-1984
(Thousands of Units)

	Product	Process	1980	1981	1982	1983	1984
Philips	8051/31	N	0	0	0	40	1,160
(Continued)	80C49/39	C	0	0	0	0	3
	84XX	N	0	0	80	1,940	2,500
RCA	1804A	C	0	0	0	4	23
	6805/68HC05	C	0	0	0	0	7
Rockwell	6500/XX	N	108	345	315	930	1,350
SGS	Z8	N	0	0	0	0	123
	387X	N	95	260	700	1,159	1,489
Sharp	Z8	N	0	0	165	980	1,950
Siemens	8021	N	0	40	95	60	28
	802XX	N	20	720	1,780	1,480	1,098
	8048/35	N	0	85	300	270	405
	8051/31	N	0	0	15	1,030	2,382
Signetics	8048/35	N	135	0	141	1,055	4,609
	8049/39	N	0	0	25	545	946
	8050/40	N	0	0	8	400	355
	8051/31	N	0	0	0	126	1,792
Synertek	Z8	N	0	2	90	135	24
TI	TMS7000	N	0	22	255	715	990
Thomson (EPCIS) ¹	6801/03	N	0	0	0	55	150
	6805	N	0	0	0	100	600
Toshiba	8048/35	N	0	130	615	1,440	3,680
	8049/39	N	0	219	555	1,230	3,900
	80C49/39	C	0	0	142	850	2,170
Zilog	Z8	N	14	344	683	851	2,055
Total 8-Bit MCUs			21,740	34,931	54,114	90,615	163,510

¹Thomson acquired EPCIS in 1984.
Source: Dataquest (June 1990)

Table 3
 Estimated 8-Bit Microcontroller Unit Shipments By Manufacturer
 1985-1989
 (Thousands of Units)

	Product	Process	1985	1986	1987	1988	1989
AMD	8051/31	N	1,610	1,700	2,240	2,110	1,755
	80515/535	N	0	0	0	0	34
	8053	N	0	0	287	510	1,220
	80C51/31	C	0	0	134	1,055	1,550
	80C521/321	C	0	0	0	0	435
	80C5292/3292	C	0	0	0	0	1,040
	8751	N	71	112	133	217	295
	8753	N	0	0	77	145	155
	89C51	C	0	0	0	0	105
Fujitsu	8048/35	N	185	328	528	80	120
	8049/39	N	707	862	1,132	162	280
	8051/31	N	0	403	1,098	153	240
	80C49/39	C	0	105	2,300	350	585
	MB897XX	C	0	0	0	1,631	2,200
Gould/AMI ¹	6801/03	N	576	21	31	7	0
	6805	N	402	127	39	4	0
Harris (GE-SS/RCA) ²	6805	N	0	0	0	355	266
	68HC05	C	120	359	805	1,430	2,705
Hitachi	6301	C	2,008	5,200	8,100	11,550	14,000
	6305	C	1,386	4,242	7,250	11,150	10,600
	63701	C	0	0	1,599	1,780	1,950
	63705	C	0	0	1,299	1,220	770
	63P01	C	0	0	645	1,040	1,130
	63P05	C	0	0	865	1,425	1,550
	6801/03	N	1,515	3,557	5,200	5,610	4,300
	6805	N	2,902	5,275	7,160	8,350	5,700
	68P01	N	0	0	545	944	1,010
	68P05	N	0	0	620	1,010	975
	H8/532	C	0	0	0	0	200
Intel	802X	N	222	93	54	10	0
	8048/35	N	1,365	595	1,067	1,500	1,140
	8049/39	N	1,530	2,401	7,475	13,100	8,720
	8050/40	N	240	225	542	1,200	1,520
	8051/31	N	6,800	6,998	12,700	13,800	12,220
	8052/32	N	269	1,600	1,885	5,800	10,560
	80C49/39	C	112	20	0	0	0
	80C51/31	C	785	2,000	3,165	6,200	10,800
	8748	N	1,310	800	693	800	690
	8749	N	1,445	2,247	3,625	3,500	3,085

(Continued)

Table 3 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments By Manufacturer
1985-1989
(Thousands of Units)

	Product	Process	1985	1986	1987	1988	1989
Intel (Continued)	8751	N	843	692	941	1,000	905
	8752	C	0	0	30	350	680
	87C51	C	0	0	100	500	820
Intersil	80C48/35	C	30	20	0	0	0
	80C49/39	C	9	10	0	0	0
Matra-Harris	8051/31	C	0	0	0	116	290
	8052/32	C	0	0	0	0	45
	80C51/31	N	20	418	1,033	712	310
	80C52/32	C	10	387	1,324	2,190	2,610
	80C752	N	1,400	1,340	429	98	0
Matsushita	83C154	C	0	0	83	660	2,945
	MN1800/70/80	C	131	400	1,070	4,620	11,900
Microchip Technology ³	PIC1652/54	N	1,515	1,700	4,063	5,242	4,065
	PIC1655/57	N	3,295	1,400	1,073	903	0
	PIC1670/72	N	2,135	1,190	460	286	269
	PIC16C52/C54	C	0	0	0	0	1,329
	PIC16C58	C	256	77	0	0	0
	PIC16E57	N	66	229	32	0	0
	PIC7000/1	N	26	234	696	130	0
	PIC7020/40	N	140	484	1,985	615	0
	PIC7041	N	12	22	33	0	0
	PIC70XX	N	0	0	0	990	275
Mitsubishi	8048/35	N	0	0	515	200	130
	8049/39	N	0	0	1,691	1,300	650
	8050/40	N	0	0	208	154	160
	80C49/39	C	0	0	2,614	690	950
	M507XX	C	0	0	23,706	22,900	20,500
	M509XX	C	0	0	13,082	25,100	24,000
Mostek ^{4,5}	M50XXX	C	15,125	29,906	0	0	0
	387X	N	867	969	795	0	0
	38P7X	N	297	145	90	0	0
	F8	N	195	299	136	0	0
Motorola	146805	C	4,071	4,705	5,422	6,598	4,802
	1468705	C	48	93	0	0	0
	387X	N	174	199	0	0	0
	6801/03	N	8,007	8,526	8,918	8,253	7,189
	6804	N	501	1,495	4,357	3,900	4,980
	6805	N	10,777	13,559	19,716	27,042	28,141
	68701	N	278	431	0	0	0

(Continued)

Table 3 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments By Manufacturer
1985-1989
(Thousands of Units)

	Product	Process	1985	1986	1987	1988	1989
Motorola (Continued)	68704	N	13	82	0	0	0
	68705	N	2,641	3,861	0	0	0
	68HC05	C	0	0	4,678	12,676	44,569
	68HC11	C	67	696	3,975	9,389	17,220
National	8048/35	N	2,200	390	425	315	245
	8049/39	N	1,910	1,650	2,095	1,950	4,050
	8050/40	N	1,500	1,280	1,838	2,210	1,435
	807X	N	5	0	0	0	0
National ⁶	COP800	C	0	0	10	1,555	4,930
	F8	N	287	304	138	45	0
	387X	N	357	10	0	0	0
NCR	6500/1	N	640	1,027	397	747	330
	6500/11	N	0	0	0	371	14
NEC	8021/22	N	350	100	40	70	25
	8041	N	2,860	2,550	1,750	1,290	1,000
	8048/35	N	2,860	3,940	4,360	2,570	2,120
	8049/39	N	5,160	5,350	4,830	3,360	3,360
	80C48/35	C	1,800	1,360	970	740	1,100
	80C49/39	C	2,060	2,110	2,680	3,430	3,440
	8741	N	850	480	330	370	702
	8748	N	1,660	1,370	590	650	620
	8749	N	2,060	1,930	3,300	1,820	1,635
	μPD78XX	N	11,450	18,390	24,140	32,210	36,100
	μPD78XXX	N	0	0	0	500	2,700
	V25	C	0	0	0	5	150
Oki	80C154	C	0	87	894	1,630	4,450
	80C48/35	C	537	520	428	385	400
	80C49/39	C	1,950	2,720	3,133	3,462	2,600
	80C51/31	C	0	1,772	2,721	3,100	2,960
Philips	8021/22	N	470	138	172	15	0
	8048/35	N	1,430	289	285	215	230
	8049/39	N	2,550	2,186	1,810	1,230	1,032
	8050/40	N	100	393	1,780	215	110
	8051/31	N	1,100	700	1,840	1,400	1,205
	80C49/39	C	145	240	514	665	725
	80C51/31	C	0	81	620	1,220	1,715
	84CXX	C	0	15	1,150	2,520	3,330
84XX	N	6,200	14,325	10,810	9,580	10,445	
RCA	1804A	C	13	11	8	0	0

(Continued)

Table 3 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments By Manufacturer
1985-1989
(Thousands of Units)

	Product	Process	1985	1986	1987	1988	1989
Rockwell	6500/XX	N	1,310	2,550	3,855	4,230	4,180
Sanyo	LC86XXX	C	0	0	0	800	1,900
	LM88XX	N	0	0	0	200	400
SGS ⁵	387X	N	2,200	4,811	3,922	0	0
	Z8	N	244	601	665	0	0
SGS-Thomson ⁵	387X	N	0	0	0	3,236	3,761
	38P7X	N	0	0	0	110	63
	6801/03	N	0	0	0	1,829	1,428
	6805	N	0	0	0	2,797	5,298
	F8	N	0	0	0	21	0
	Z8	N	0	0	0	444	855
Sharp	CUSTOM	C	0	0	0	170	1,200
	SM-Series	C	0	0	530	425	1,500
	Z8	N	426	686	590	425	535
Siemens	8021	N	138	0	0	0	0
	802XX	N	1,538	667	51	66	39
	8048/35	N	194	956	1,733	1,345	1,223
	8051/31	N	2,497	2,194	4,055	5,123	4,945
	80515/35	N	0	126	768	1,974	3,573
	8052/32	N	0	713	1,431	2,642	3,520
Signetics	8048/35	N	2,563	760	111	18	0
	8049/39	N	1,235	1,741	2,000	2,449	3,797
	8050/40	N	277	273	723	698	0
	8051/31	N	2,362	2,687	2,731	4,038	2,921
	8052/32	N	5	456	1,541	1,958	4,033
	80C451	C	0	0	0	55	44
	80C51/31	C	0	60	283	1,653	4,250
	83C451	C	0	0	27	0	0
	8400	N	0	30	43	10	0
	8441	C	0	0	128	18	0
	87C451	C	0	0	10	15	98
	87C51	C	0	0	0	0	316
	87C751	C	0	0	0	0	77
Sony	SPC700	C	0	0	0	800	5,400
TI	TMS370	C	0	0	0	0	176
	TMS7000	N	1,396	2,555	6,600	8,800	9,800
Thomson ⁵	6801/03	N	337	906	1,131	0	0
	6805	N	1,129	1,190	2,182	0	0

(Continued)

Table 3 (Continued)

**Estimated 8-Bit Microcontroller Unit Shipments By Manufacturer
1985-1989
(Thousands of Units)**

	Product	Process	1985	1986	1987	1988	1989
Toshiba	8048/35	N	4,504	1,150	1,171	890	500
	8049/39	N	5,207	2,350	1,760	1,485	740
	80C48/35	C	0	1,000	2,950	3,200	1,700
	80C49/39	C	2,925	2,280	3,600	4,200	3,250
	80C50/40	C	0	520	851	820	900
	TLCS-870	C	0	0	0	0	130
	TLCS-90	C	0	0	0	850	2,850
Zilog	Z8	N	2,099	3,112	3,422	5,025	6,500
Total 8-Bit MCUs			163,599	212,931	299,470	377,476	458,699

Note: Totals for 1986, 1987, and 1988 have been adjusted to remove Dataquest's previous estimates for unsurveyed companies. Totals now reflect actual survey results. Additionally, because of the receipt of new information, 1988 numbers have been restated for many Japanese companies.

¹Gould Semiconductor acquired AMI, 1985.

²Harris acquired GE Solid State and RCA, 1988.

³General Instrument's Microelectronics Division spun off a new company under the name Microchip Technology, 1987.

⁴Thomson Components acquired Mostek, forming Thomson Components-Mostek Corporation (TCMC), 1985.

⁵SGS and Thomson merged, forming SGS-Thomson, 1987. (TCMC lost independent identity with the merger.)

⁶National acquired Fairchild, 1987.

Source: Dataquest (June 1990)

Table 4

**Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1975-1976
(Thousands of Units)**

	Product	Process	1975	Q1/76	Q2/76	Q3/76	Q4/76	1976
Fairchild	F8	N	27	8	33	70	70	181
Mostek	F8	N	5	5	15	20	30	70
Total 8-Bit MCUs			32	13	48	90	100	251

Source: Dataquest (June 1990)

Table 5

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1977
(Thousands of Units)

	Product	Process	Q1/77	Q2/77	Q3/77	Q4/77	1977
Fairchild	3870	N	0	0	0	15	15
	F8	N	100	130	180	245	655
Intel	8048	N	0	15	30	60	105
Mostek	F8	N	10	15	25	40	90
	3870	N	0	0	5	15	20
Total 8-Bit MCUs			110	160	240	375	885

Source: Dataquest (June 1990)

Table 6

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1978
(Thousands of Units)

	Product	Process	Q1/78	Q2/78	Q3/78	Q4/78	1978
Fairchild	F8	N	110	130	190	200	630
	3870	N	3	5	5	10	23
General Instrument	PIC1650	N	75	95	105	175	450
Intel	8048	N	60	100	150	170	480
	8748	N	0	0	5	25	30
	8049/39	N	0	0	0	10	10
Mostek	3870	N	20	50	75	205	350
	F8	N	50	30	35	45	160
Motorola	3870	N	5	10	15	40	70
NEC	8048/35	N	0	0	0	15	15
Total 8-Bit MCUs			323	420	580	895	2,218

Source: Dataquest (June 1990)

Table 7

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1979
(Thousands of Units)

	Product	Process	Q1/79	Q2/79	Q3/79	Q4/79	1979
AMD	8048	N	0	S	3	20	23
Fairchild	F8	N	150	150	180	170	650
	3870	N	40	50	120	300	510
General Instrument	PIC1650	N	300	950	1,250	1,600	4,100
Intel	8048	N	190	390	570	800	1,950
	8748	N	50	75	75	100	300
	8049/39	N	20	30	60	100	210
	8021/22	N	10	20	50	80	160
Mostek	3870	N	260	300	425	485	1,470
	F8	N	90	125	125	130	470
Motorola	6801/03	N	0	S	3	10	13
	6805	N	0	0	S	3	3
	3870	N	80	125	125	170	500
National	8049/39	N	0	0	S	10	10
NEC	8048/35	N	25	160	250	300	735
	8049/39	N	0	S	100	150	250
Rockwell	6500/1	N	0	S	3	5	8
SGS-ATES	387X	N	5	10	15	20	50
Signetics	8048/35	N	15	30	60	75	180
Total 8-Bit MCUs			1,235	2,415	3,414	4,528	11,592

S = Sampled

Source: Dataquest (June 1990)

Table 8
Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1980
(Thousands of Units)

	Product	Process	Q1/80	Q2/80	Q3/80	Q4/80	1980
AMD	8048	N	5	38	40	55	138
Fairchild	F8	N	170	150	150	150	620
	3870	N	345	380	550	520	1,795
Fujitsu	8048	N	0	S	50	100	150
	8049	N	0	S	100	200	300
General Instrument	PIC1650	N	1,700	1,700	1,100	1,100	5,600
Intel	8048	N	1,000	1,000	750	1,000	3,750
	8049/39	N	140	175	175	225	715
	8021/22	N	110	200	200	300	810
	8748	N	125	160	140	225	650
Mostek	3870	N	530	570	455	550	2,105
	F8	N	55	70	45	35	205
Motorola	6801/03	N	15	35	70	75	195
	6805	N	10	50	250	150	460
	3870	N	150	150	160	175	635
National	807X	N	S	5	10	16	31
	8050/40	N	5	10	15	20	50
	8048/35	N	S	5	15	25	45
	8049/39	N	25	40	50	60	175
NEC	8048/35	N	610	470	450	460	1,990
	8021	N	0	S	S	10	10
	8049/39	N	200	250	170	300	920
Philips	8048/35	N	2	5	5	7	19
Rockwell	6500/1	N	8	15	35	50	108
SGS-ATES	387X	N	20	25	30	20	95
Siemens	802XX	N	0	S	5	15	20
Signetics	8048/35	N	60	60	10	5	135
Zilog	Z8	N	S	3	5	6	14
Total 8-Bit MCUs			5,285	5,566	5,035	5,854	21,740

S = Sampled

Source: Dataquest (June 1990)

Table 9
Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1981
(Thousands of Units)

	Product	Process	Q1/81	Q2/81	Q3/81	Q4/81	1981
AMD	8048	N	50	50	65	75	240
	8049	N	0	10	10	15	35
Fairchild	F8	N	175	200	210	160	745
	3870	N	900	850	700	650	3,100
Fujitsu	8048	N	100	100	100	100	400
	8049	N	175	250	250	250	925
General Instrument	PIC1650	N	1,000	1,100	1,025	1,000	4,125
Hitachi	6801/03	N	20	30	60	80	190
	6805	N	45	45	90	120	300
Intel	8751	N	0	0	3	1	4
	8021/22	N	325	350	400	450	1,525
	8749	N	S	S	1	2	3
	8051	N	S	4	9	12	25
	8748	N	200	200	175	200	775
	8048	N	1,100	1,200	1,300	1,200	4,800
Mostek	8049/39	N	250	275	325	380	1,230
	3870	N	755	550	435	745	2,485
Motorola	F8	N	50	30	8	22	110
	146805	C	4	6	40	45	95
Motorola	68701	N	4	5	12	12	33
	6805	N	210	610	755	760	2,335
	6801/03	N	130	210	555	760	1,655
	68705	N	2	12	20	30	64
	3870	N	190	210	200	100	700
	8050/40	N	45	70	120	170	405
	807X	N	28	12	15	15	70
National	8048/35	N	60	100	140	160	460
	8049/39	N	90	140	210	270	710
	8021	N	20	40	30	50	140
NEC	8048/35	N	450	450	400	600	1,900
	8049/39	N	325	350	600	850	2,125
	uPD78XX	N	40	90	110	250	490
	8748	N	20	50	65	60	195
Philips	8048/35	N	10	60	80	100	250
	8021/22	N	15	25	30	50	120
Rockwell	6500/1	N	100	100	75	70	345
SGS-ATES	387X	N	40	50	80	90	260

(Continued)

Table 9 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1981
(Thousands of Units)

	Product	Process	Q1/81	Q2/81	Q3/81	Q4/81	1981
Siemens	8048/35	N	S	10	35	40	85
	8021	N	S	5	20	15	40
	802XX	N	20	50	300	350	720
Synertek	Z8	N	0	0	S	2	2
TI	TMS7000	N	0	2	5	15	22
Toshiba	8048/35	N	25	30	35	40	130
	8049/39	N	39	50	60	70	219
Zilog	Z8	N	15	24	100	205	344
Total 8-Bit MCUs			7,027	8,005	9,258	10,641	34,931

S = Sampled

Source: Dataquest (June 1990)

Table 10
Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1982
(Thousands of Units)

	Product	Process	Q1/82	Q2/82	Q3/82	Q4/82	1982
AMD	8048	N	75	80	80	85	320
	8049	N	15	25	30	35	105
	6805	N	0	S	S	60	60
Eurotechnique	8048/35	N	S	1	3	5	9
	8049/39	N	S	1	10	25	36
	8050/40	N	S	1	50	70	121
Fairchild	3870	N	600	600	250	300	1,750
	F8	N	175	250	220	200	845
Fujitsu	8048	N	90	80	80	85	335
	8049	N	260	260	270	290	1,080
General Instrument	PIC1650	N	1,100	1,100	1,000	1,000	4,200
Hitachi	6301	C	21	42	63	84	210
	6305	C	14	28	42	56	140
	6801/03	N	125	150	170	190	635
	6805	N	150	195	225	255	825
Intel	8021/22	N	500	600	500	450	2,050
	8048	N	1,300	1,350	1,300	1,250	5,200
	8049/39	N	450	500	450	470	1,870
	8051	N	30	50	80	300	460
	8748	N	230	400	450	450	1,530
	8749	N	30	100	150	170	450
	8751	N	10	10	20	30	70
Matra-Harris	8048	N	0	S	1	5	6
Matsushita	MN1800	N	S	S	7	10	17
Mostek	3870	N	600	580	450	400	2,030
	F8	N	15	10	6	2	33
Motorola	146805	C	60	65	160	350	635
	3870	N	75	100	130	120	425
	6801/03	N	875	770	775	900	3,320
	6805	N	875	930	1,450	1,520	4,775
	68701	N	18	20	20	20	78
	68705	N	42	40	95	85	262
National	8048/35	N	170	225	300	300	995
	8049/39	N	300	375	200	250	1,125
	8050/40	N	200	260	200	220	880
	807X	N	15	20	8	10	53
	80C48/49	C	0	0	20	40	60
NEC	8021	N	50	50	50	50	200
	9048/35	N	700	700	590	450	2,400
	8049/39	N	1,000	1,200	1,000	1,000	4,200

(Continued)

Table 10 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1982
(Thousands of Units)

	Product	Process	Q1/82	Q2/82	Q3/82	Q4/82	1982
NEC	80C48/35	C	0	10	110	110	230
(Continued)	80C49/39	C	0	5	46	100	151
	8748	N	100	160	50	200	510
	8749	N	1	3	5	20	29
	uPD78XX	N	350	500	600	600	2,050
Oki	80C48	C	0	0	5	20	25
	80C49	C	0	10	40	85	135
Philips	8021/22	N	60	70	70	80	280
	8048/35	N	150	175	225	260	810
	8049/39	N	10	15	30	40	95
	84XX	N	0	S	10	70	80
Rockwell	6500/1	N	70	80	80	85	315
SGS	387X	N	130	180	170	220	700
Sharp	Z8	N	20	25	50	70	165
Siemens	8021	N	20	25	25	25	95
	802XX	N	410	450	470	450	1,780
	8048/35	N	50	70	90	90	300
	8051/31	N	0	S	S	15	15
Signetics	8048/35	N	0	6	55	80	141
	8049/39	N	0	S	10	15	25
	8050/40	N	0	S	2	6	8
Synertek	Z8	N	5	5	30	50	90
TI	TMS7000	N	35	50	70	100	255
Toshiba	8048/35	N	50	115	220	230	615
	8049/39	N	90	140	160	165	555
	80C49/39	C	5	12	50	75	142
Zilog	Z8	N	220	180	140	143	683
Total 8-Bit MCUs			11,946	13,454	13,718	14,996	54,114

S = Sampled

Source: Dataquest (June 1990)

Table 11

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1983
(Thousands of Units)

	Product	Process	Q1/83	Q2/83	Q3/83	Q4/83	1983
AMD	8048	N	60	50	25	55	190
	8049	N	30	25	25	30	110
	8051	N	1	70	125	180	376
EFCIS	6801/03	N	S	10	20	25	55
	6805	N	S	20	35	45	100
Eurotechnique	8048/35	N	7	9	1	1	16
	8049/39	N	40	55	1	1	95
	8050/40	N	100	125	1	1	225
Fairchild	3870	N	300	350	340	380	1,370
	F8	N	210	220	150	100	680
Fujitsu	8048	N	90	90	85	85	350
	8049	N	320	325	340	340	1,325
General Instrument	PIC1652/54	N	170	217	220	410	1,017
	PIC1655/57	N	670	603	766	815	2,854
	PIC1670/72	N	530	390	466	725	2,111
	PIC16C58	N	130	290	58	160	638
Gould	6801	N	S	S	S	220	220
	6805	N	40	10	5	65	120
Hitachi	6301	C	150	162	190	220	722
	6305	C	100	120	150	170	540
	6801/03	N	210	235	275	315	1,035
	6805	N	300	335	375	410	1,420
Intel	8021/22	N	425	370	320	280	1,395
	8048	N	1,300	1,300	1,300	1,350	5,250
	8049/39	N	500	510	525	550	2,085
	8050/40	N	S	70	110	120	300
	8051	N	320	610	800	1,800	3,530
	8052/32	N	S	10	12	15	37
	80C48/35	C	3	5	5	5	18
	80C49/39	C	S	40	50	50	140
	80C51/31	C	S	40	50	50	140
	8748	N	470	445	550	600	2,065
	8749	N	180	180	250	350	960
	8751	N	35	60	75	150	320
	Matra-Harris	8048	N	7	9	12	20
Matsushita	MN1800	N	7	7	7	7	28
Mostek	3870	N	430	430	400	400	1,660
	F8	N	50	45	25	70	190
Motorola	146805	C	465	440	387	594	1,886
	1468705	C	1	1	1	2	5

(Continued)

Table 11 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1983
(Thousands of Units)

	Product	Process	Q1/83	Q2/83	Q3/83	Q4/83	1983
Motorola	3870	N	75	20	16	15	126
(Continued)	6801/03	N	910	1,100	2,296	2,805	7,111
	6804	N	0	0	S	S	S
	6805	N	1,520	1,600	2,024	1,790	6,934
	68701	N	65	100	141	58	364
	68705	N	90	150	176	168	584
National	8048/35	N	320	340	375	415	1,450
	8049/39	N	300	320	320	350	1,290
	8050/40	N	275	305	330	360	1,270
	807X	N	15	15	15	15	60
	80C48/49	C	55	50	65	75	245
NCR	6500/1	N	S	25	80	110	215
NEC	8021	N	30	50	85	80	245
	8048/35	N	550	550	700	1,560	3,360
	8049/39	N	1,450	1,600	1,600	1,300	5,950
	80C48/35	C	125	125	210	480	940
	80C49/39	C	100	100	160	290	650
	8748	N	200	400	250	240	1,090
	8749	N	35	100	60	60	255
	uPD78XX	N	650	1,150	1,300	1,860	4,960
Old	80C48	C	30	43	50	80	203
	80C49	C	100	137	200	390	827
Philips	8021/22	N	70	90	90	110	360
	8048/35	N	280	200	230	230	940
	8049/39	N	60	60	100	100	320
	8051/31	N	0	5	10	25	40
	84XX	N	190	530	620	600	1,940
RCA	1804A	C	S	S	2	2	4
Rockwell	6500/1	N	150	300	250	230	930
SGS-ATES	387X	N	254	245	300	360	1,159
Sharp	Z8	N	80	150	300	450	980
Siemens	8021	N	25	5	25	5	60
	802XX	N	380	300	300	500	1,480
	8048/35	N	90	50	40	90	270
	8051/31	N	60	250	300	420	1,030
Signetics	8048/35	N	220	265	280	290	1,055
	8049/39	N	110	135	150	150	545
	8050/40	N	90	110	100	100	400
	8051/31	N	3	3	40	80	126
Synertek	Z8	N	60	25	30	20	135

(Continued)

Table 11 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1983
(Thousands of Units)

	Product	Process	Q1/83	Q2/83	Q3/83	Q4/83	1983
TI	TMS7000	N	130	175	190	220	715
Toshiba	8048/35	N	280	340	400	420	1,440
	8049/39	N	250	270	300	410	1,230
	80C49/39	C	120	190	300	240	850
Zilog	Z8	N	150	190	211	300	851
Total 8-Bit MCUs			17,598	20,451	23,550	29,016	90,615

*Taken over by Thomson

S = Sampled

Source: Dataquest (June 1990)

Table 12
 Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1984
 (Thousands of Units)

	Product	Process	Q1/84	Q2/84	Q3/84	Q4/84	1984
AMD	8048	N	35	5	0	0	40
	8049	N	5	5	0	0	10
	8051	N	385	575	900	400	2,260
AMI	6801	N	240	260	280	300	1,080
	6805	N	105	105	150	180	540
Fairchild	387X	N	346	282	285	162	1,075
	F8	N	26	19	20	9	74
Fujitsu	8048	N	90	95	120	120	425
	8049	N	350	360	400	400	1,510
General Instrument	7000/1	N	0	1	5	4	10
	7020/40	N	0	15	20	22	57
	7041	N	0	5	5	3	13
	PIC1652/54	N	425	435	435	355	1,650
	PIC1655/57	N	975	1,150	1,200	980	4,305
	PIC1670/72	N	775	780	780	640	2,975
	PIC16C58	N	165	110	110	90	475
Hitachi	6301V	C	300	325	367	480	1,472
	6305	C	200	215	215	320	950
	6801/03	N	360	400	572	570	1,902
	6805	N	490	570	856	850	2,766
Intel	802X	N	250	250	300	250	1,050
	8048/35	N	1,325	1,000	800	700	3,825
	8049/39	N	560	900	800	700	2,960
	8050/40	N	130	130	130	100	490
	8051/31	N	2,300	3,800	3,600	3,200	12,900
	8052/32	N	18	50	65	80	213
	80C48/35	C	5	5	0	0	10
	80C49/39	C	55	55	60	60	230
	80C51/31	C	50	50	80	85	265
	8748	N	625	625	625	625	2,500
	8749	N	390	390	600	650	2,030
	8751	N	200	200	200	195	795
	Intersil	80C48/35	C	0	0	12	32
Matra-Harris	8048	N	30	40	40	20	130
	8051	N	20	15	250	350	635
	80C48	C	0	0	10	10	20
Matsushita	MN1800	N	10	10	10	10	40
Mostek	387X	N	375	400	300	350	1,425
	38P7X	N	0	0	58	90	148
	F8	N	40	40	40	75	195

(Continued)

Table 12 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1984
(Thousands of Units)

	Product	Process	Q1/84	Q2/84	Q3/84	Q4/84	1984
Motorola	146805	C	790	1,109	1,238	1,252	4,389
	1468705	C	4	4	19	7	34
	387X	N	10	11	16	23	60
	6801/03	N	2,151	2,055	1,849	1,865	7,920
	6804	N	0	0	7	29	36
	6805	N	1,993	1,772	2,379	2,188	8,332
	68701	N	50	56	56	37	199
	68705	N	358	493	535	518	1,904
	68HC11	C	0	0	0	3	3
	National	8048/35	N	575	600	800	800
8049/39		N	390	400	700	700	2,190
8050/40		N	465	475	500	500	1,940
807X		N	10	10	10	5	35
80C48/35		C	30	10	0	0	40
NCR	6500/1	N	150	150	150	150	600
NEC	8021/22	N	100	110	130	130	470
	8041	C	0	0	1,110	1,110	2,220
	8741	C	0	0	190	190	380
	8048/35	N	1,970	2,190	2,350	1,240	7,750
	8049/39	N	2,050	1,360	1,900	1,900	7,210
	80C48/35	C	570	610	420	420	2,020
	80C49/39	C	410	360	500	500	1,770
	8748	N	520	620	550	360	2,050
	8749	N	230	200	290	290	1,010
		uPD78XX	N	2,360	2,880	3,270	3,270
Oki	80C48/35	C	100	120	140	90	450
	80C49/39	C	450	500	560	450	1,960
	Philips	8021/22	N	160	150	170	170
Philips	8048/35	N	460	650	1,000	1,000	3,110
	8049/39	N	380	650	900	1,000	2,930
	8050/40	N	0	0	0	10	10
	80C49	C	0	0	0	3	3
	8051/31	N	60	300	400	400	1,160
	84XX	N	500	400	700	900	2,500
	RCA	1804A	C	2	5	6	10
	6805	N	0	1	1	5	7
Rockwell	6500/1	N	325	475	350	200	1,350
SGS	387X	N	375	344	420	350	1,489
	Z8	N	0	110	0	13	123
Sharp	Z8	N	475	475	500	500	1,950

(Continued)

Table 12 (Continued)

**Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1984
(Thousands of Units)**

	Product	Process	Q1/84	Q2/84	Q3/84	Q4/84	1984
Siemens	8021	N	5	6	9	8	28
	802XX	N	306	221	306	265	1,098
	8048/35	N	91	141	108	65	405
	8051/31	N	522	533	662	665	2,382
Signetics	8048/35	N	540	1,263	1,386	1,420	4,609
	8049/39	N	150	162	244	390	946
	8050/40	N	100	90	85	80	355
	8051/31	N	85	125	692	890	1,792
Synertek	Z8	N	9	9	4	2	24
TI	TMS7000	N	240	250	250	250	990
Thomson ¹	6801/03	N	30	30	15	75	150
	6805	N	50	120	130	300	600
Toshiba	8048/35	N	400	480	1,300	1,500	3,680
	8049/39	N	500	500	1,300	1,600	3,900
	80C49/39	C	280	290	750	850	2,170
Zilog	Z8	N	435	675	450	495	2,055
Total 8-Bit MCUs			33,871	38,222	46,507	44,910	163,510

¹Thomson acquired EPCIS.
Source: Dataquest (June 1990)

Table 13

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1985
(Thousands of Units)

	Product	Process	Q1/85	Q2/85	Q3/85	Q4/85	1985
AMD	8051/31	N	250	400	360	600	1,610
	8751	N	2	15	14	40	71
Fairchild	387X	N	148	90	52	67	357
	F8	N	33	60	80	114	287
Fujitsu	8048/35	N	60	40	40	45	185
	8049/39	N	200	180	162	165	707
General Instrument	PIC1652/54	N	350	400	425	340	1,515
	PIC1655/57	N	975	840	790	690	3,295
	PIC1670/72	N	650	550	510	425	2,135
	PIC16C58	C	85	77	69	25	256
	PIC16E57	N	5	8	8	45	66
	PIC7000/1	N	6	5	5	10	26
	PIC7020/40	N	25	40	45	30	140
	PIC7041	N	3	3	3	3	12
Gould/AMI ¹	6801/03	N	290	250	16	20	576
	6805	N	175	158	32	37	402
Hitachi	6301V	C	420	425	383	780	2,008
	6305	C	280	290	261	555	1,386
	6801/03	N	385	400	360	370	1,515
	6805	N	552	560	625	1,165	2,902
Intel	802X	N	125	35	32	30	222
	8048/35	N	400	350	315	300	1,365
	8049/39	N	420	400	360	350	1,530
	8050/40	N	100	50	45	45	240
	8051/31	N	2,500	1,500	1,500	1,300	6,800
	8052/32	N	80	68	61	60	269
	80C49/39	C	40	30	27	15	112
	80C51/31	C	100	150	275	260	785
	8748	N	525	250	275	260	1,310
	8749	N	410	300	275	460	1,445
Intersil	8751	N	275	200	248	120	843
	80C48/35	C	8	8	7	7	30
	80C49/39	C	3	2	2	2	9
Matra-Harris	8051	N	450	300	300	350	1,400
	8052	N	0	0	0	20	20
	80C51	C	0	0	0	10	10
Matsushita	MN1800	C	10	24	32	65	131
Mitsubishi	M50XXX	C	3,200	4,050	3,900	3,975	15,125

(Continued)

Table 13 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1985
(Thousands of Units)

	Product	Process	Q1/85	Q2/85	Q3/85	Q4/85	1985
Motorola	146805	C	1,052	915	1,008	1,096	4,071
	1468705	C	8	7	7	26	48
	387X	N	14	63	65	32	174
	6801/03	N	1,840	2,246	2,265	1,656	8,007
	6804	N	33	116	158	194	501
	6805	N	2,284	2,258	2,779	3,456	10,777
	68701	N	37	80	80	81	278
	68704	N	0	0	4	9	13
	68705	N	613	532	745	751	2,641
	68HC11	C	5	8	10	44	67
National	8048/35	N	800	690	480	230	2,200
	8049/39	N	700	500	370	340	1,910
	8050/40	N	500	380	320	300	1,500
	807X	N	5	0	0	0	5
NCR	6500/1	N	160	110	180	190	640
NEC	8021/22	N	130	120	60	40	350
	8041	N	1,130	450	600	680	2,860
	8048/35	N	1,090	570	600	600	2,860
	8049/39	N	1,820	1,030	1,120	1,190	5,160
	80C48/35	C	710	470	340	280	1,800
	80C49/39	C	690	550	360	460	2,060
	8741	N	270	270	170	140	850
	8748	N	480	550	340	290	1,660
	8749	N	460	640	550	410	2,060
	uPD78XX	N	2,680	2,740	2,510	3,520	11,450
Olivetti	80C48/35	C	150	135	124	128	537
	80C49/39	C	560	440	440	510	1,950
Philips	8021/22	N	170	150	110	40	470
	8048/35	N	700	400	200	130	1,430
	8049/39	N	1,000	700	500	350	2,550
	8050/40	N	20	20	20	40	100
	8051/31	N	350	300	250	200	1,100
	80C49/39	C	15	50	50	30	145
	84XX	N	1,100	1,300	1,800	2,000	6,200
RCA	1804A	C	5	3	3	2	13
	6805/68HC05	C	20	10	25	65	120
Rockwell	6500/XX	N	150	400	360	400	1,310
SGS	387X	N	530	550	495	625	2,200
	Z8	N	55	47	42	100	244
Sharp	Z8	N	23	23	190	190	426

(Continued)

Table 13 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1985
(Thousands of Units)

	Product	Process	Q1/85	Q2/85	Q3/85	Q4/85	1985
Siemens	8021	N	24	54	30	30	138
	802XX	N	295	427	468	348	1,538
	8048/35	N	40	57	57	40	194
	8051/31	N	700	630	567	600	2,497
Signetics	8048/35	N	1,400	400	463	300	2,563
	8049/39	N	400	200	250	385	1,235
	8050/40	N	92	50	60	75	277
	8051/31	N	870	400	417	675	2,362
	8052/32	N	0	0	0	5	5
TI	TMS7000	N	400	350	316	330	1,396
Thomson	6801/03	N	65	59	53	160	337
	6805	N	350	315	284	180	1,129
TCMC (Mostek) ²	387X	N	273	159	211	224	867
	38P7X	N	112	80	61	44	297
	F8	N	62	51	42	40	195
Toshiba	8048/35	N	1,600	1,404	1,000	500	4,504
	8049/39	N	1,700	1,530	1,377	600	5,207
	80C49/39	C	900	675	650	700	2,925
Zilog	Z8	N	564	550	495	490	2,099
Total 8-Bit MCUs			45,746	39,722	38,425	39,706	163,599

¹AMI was acquired by Gould Semiconductor.

²Thomson Components acquired Mostek Corporation from United Technologies, forming Thomson Components—Mostek Corporation (TCMC).

Source: Dataquest (June 1990)

Table 14
 Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1986
 (Thousands of Units)

	Product	Process	Q1/86	Q2/86	Q3/86	Q4/86	1986
AMD	8051/31	N	350	350	450	550	1,700
	8751	N	30	35	22	25	112
Fairchild	387X	N	9	1	0	0	10
	F8	N	27	89	98	90	304
Fujitsu	8048/35	N	55	73	92	108	328
	8049/39	N	192	208	224	238	862
	8051/31	N	65	88	116	134	403
	80C49/39	C	15	20	34	36	105
General Instrument	PIC1652/54	N	400	500	400	400	1,700
	PIC1655/57	N	300	300	400	400	1,400
	PIC1670/72	N	200	490	250	250	1,190
	PIC16C58	C	32	45	0	0	77
	PIC16E57	N	57	60	52	60	229
	PIC7000/1	N	14	20	100	100	234
	PIC7020/40	N	134	150	100	100	484
	PIC7041	N	3	5	6	8	22
Gould Semiconductor	6801/03	N	16	4	0	1	21
	6805	N	42	48	10	27	127
Hitachi	6301	C	950	1,265	1,175	1,810	5,200
	6305	C	760	955	1,152	1,375	4,242
	6801/03	N	520	840	1,062	1,135	3,557
Intel	6805	N	1,180	1,360	1,425	1,310	5,275
	802X	N	30	25	20	18	93
	8048/35	N	130	140	160	165	595
	8049/39	N	415	450	746	790	2,401
	8050/40	N	50	52	65	58	225
	8051/31	N	1,422	1,626	1,965	1,985	6,998
	8052/32	N	150	170	548	732	1,600
	80C49/39	C	0	5	5	10	20
	80C51/31	C	300	310	588	802	2,000
	8748	N	200	200	200	200	800
	8749	N	500	512	535	700	2,247
	8751	N	150	155	175	212	692
	Intersil	80C48/35	C	2	3	5	10
80C49/39		C	2	3	4	1	10
Matra-Harris	8051	N	358	362	280	340	1,340
	8052	N	20	105	123	170	418
	80C51	C	10	70	107	200	387
Matsushita	MN1800	C	70	100	110	120	400
Mitsubishi	M50XXX	C	6,860	7,250	7,606	8,190	29,906
Motorola	146805	C	1,002	1,050	1,030	1,623	4,705

(Continued)

Table 14 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1986
(Thousands of Units)

	Product	Process	Q1/86	Q2/86	Q3/86	Q4/86	1986
	1468705	C	23	25	22	23	93
	387X	N	98	40	20	41	199
	6801/03	N	2,116	2,053	2,101	2,256	8,526
	6804	N	184	254	541	516	1,495
	6805	N	3,131	3,399	3,290	3,739	13,559
	68701	N	92	152	125	62	431
	68704	N	10	10	33	29	82
	68705	N	779	961	1,004	1,117	3,861
	68HC11	C	120	142	180	254	696
National	8048/35	N	100	50	130	110	390
	8049/39	N	350	250	550	500	1,650
	8050/40	N	330	320	330	300	1,280
NCR	6500/1	N	255	230	265	277	1,027
NEC	8021/22	N	40	10	20	30	100
	8041	N	730	730	580	510	2,550
	8048/35	N	900	950	990	1,100	3,940
	8049/39	N	1,150	1,530	1,450	1,220	5,350
	80C48/35	C	330	580	230	220	1,360
	80C49/39	C	410	540	470	690	2,110
	8741	N	280	60	50	90	480
	8748	N	410	300	460	200	1,370
	8749	N	530	430	520	450	1,930
	uPD78XX	N	3,850	4,580	5,200	4,760	18,390
Oki	80C154	C	0	0	12	75	87
	80C48/35	C	130	135	130	125	520
	80C49/39	C	590	650	790	690	2,720
	80C51	C	150	282	520	820	1,772
Philips	8021/22	N	35	38	40	25	138
	8048/35	N	75	69	70	75	289
	8049/39	N	550	550	550	536	2,186
	8050/40	N	90	95	100	108	393
	8051/31	N	150	160	180	210	700
	80C49/39	C	50	55	65	70	240
	80C51/31	C	5	15	26	35	81
	84CXX	C	0	0	0	15	15
	84XX	N	3,200	3,400	4,000	3,725	14,325
RCA	1804A	C	4	2	2	3	11
	6805/68HC05	C	55	65	88	151	359
Rockwell	6500/XX	N	450	640	510	950	2,550

(Continued)

Table 14 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1986
(Thousands of Units)

	Product	Process	Q1/86	Q2/86	Q3/86	Q4/86	1986
SGS	387X	N	852	1,301	1,030	1,628	4,811
	Z8	N	194	153	147	107	601
Sharp	Z8	N	230	160	142	154	686
Siemens	802XX	N	340	304	15	8	667
	8048/35	N	26	68	431	431	956
	8051/31	N	321	573	733	567	2,194
	80515/35	N	0	0	13	113	126
	8052/32	N	81	117	219	296	713
Signetics	8048/35	N	225	215	230	90	760
	8049/39	N	440	450	465	386	1,741
	8050/40	N	68	70	73	62	273
	8051/31	N	650	665	712	660	2,687
	8052/32	N	87	102	126	141	456
	80C51/31	C	3	7	10	40	60
	8400	N	1	6	13	10	30
TI	TMS7000	N	450	470	785	850	2,555
Thomson	6801/03	N	200	235	225	246	906
	6805	N	260	290	310	330	1,190
TCMC (Mostek)	387X	N	255	239	225	250	969
	38P7X	N	56	38	28	23	145
	F8	N	23	151	70	55	299
Toshiba	8048/35	N	250	250	350	300	1,150
	8049/39	N	550	550	650	600	2,350
	80C48/35	C	200	200	300	300	1,000
	80C49/39	C	400	480	800	600	2,280
	80C50/40	C	100	120	200	100	520
Zilog	Z8	N	710	835	770	797	3,112
Total 8-Bit MCUs			45,746	51,295	56,156	59,734	212,931

Source: Dataquest (June 1990)

Table 15

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1987
(Thousands of Units)

	Product	Process	Q1/87	Q2/87	Q3/87	Q4/87	1987
AMD	8051/31	N	436	538	626	640	2,240
	8053	N	0	22	115	150	287
	80C51/31	C	15	5	24	90	134
	8751	N	26	30	35	42	133
	8753	N	10	20	22	25	77
Fujitsu	8048/35	N	112	126	135	155	528
	8049/39	N	252	285	280	315	1,132
	8051/31	N	252	265	276	305	1,098
	80C49/39	C	350	500	650	800	2,300
Gould Semiconductor	6801/03	N	8	2	6	15	31
	6805	N	8	22	3	6	39
Hitachi	6301	C	1,800	1,800	2,000	2,500	8,100
	6305	C	1,600	1,700	1,850	2,100	7,250
	63701	C	150	320	449	680	1,599
	63705	C	180	276	385	458	1,299
	63P01	C	100	145	175	225	645
	63P05	C	125	190	250	300	865
	6801/03	N	1,250	1,300	1,300	1,350	5,200
	6805	N	1,565	1,685	1,790	2,120	7,160
	68P01	C	85	115	165	180	545
	68P05	C	100	145	175	200	620
Intel	802X	N	18	16	11	9	54
	8048/35	N	285	265	255	262	1,067
	8049/39	N	1,315	1,360	2,700	2,100	7,475
	8050/40	N	70	72	200	200	542
	8051/31	N	2,000	2,500	3,800	4,400	12,700
	8052/32	N	400	435	500	550	1,885
	80C51/31	C	700	665	1,000	800	3,165
	8748	N	200	192	155	146	693
	8749	N	900	920	880	925	3,625
	8751	N	220	225	266	230	941
	8752	C	0	0	0	30	30
	87C51	C	0	0	0	100	100
	Matra-Harris	8051	N	120	126	73	110
8052		N	199	245	310	279	1,033
80C51		C	250	310	360	404	1,324
80C52		C	2	12	23	46	83
Matsushita	MN1800	C	100	320	330	320	1,070

(Continued)

Table 15 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1987
(Thousands of Units)

	Product	Process	Q1/87	Q2/87	Q3/87	Q4/87	1987
Microchip	PIC1652/54	N	758	960	1,300	1,045	4,063
Technology ¹	PIC1655/57	N	350	347	126	250	1,073
	PIC1670/72	N	80	120	135	125	460
	PIC16E57	N	15	10	7	0	32
	PIC7000/1	N	145	160	175	216	696
	PIC7020/40	N	475	525	505	480	1,985
	PIC7041	N	6	6	15	6	33
Mitsubishi	M507XX	C	5,773	5,783	6,174	5,976	23,706
	M509XX	C	1,076	2,295	4,978	4,733	13,082
	8048/35	N	140	61	28	286	515
	8049/39	N	448	344	375	524	1,691
	8050/40	N	52	35	83	38	208
	80C49/39	C	1,859	221	310	224	2,614
Motorola	146805	C	1,163	1,381	1,428	1,450	5,422
	6801/03	N	2,256	2,267	2,232	2,163	8,918
	6804	N	853	1,149	970	1,385	4,357
	6805	N	4,918	4,785	4,923	5,090	19,716
	68HC05	C	714	974	1,316	1,674	4,678
	68HC11	C	402	696	1,290	1,587	3,975
National	8048/35	N	102	103	120	100	425
	8049/39	N	465	480	650	500	2,095
	8050/40	N	350	368	550	570	1,838
	COP800	C	0	0	0	10	10
National ²	F8	N	48	40	20	30	138
NCR	6500/1	N	165	170	60	2	397
NEC	8021/22	N	0	20	10	10	40
	8041	N	380	540	480	350	1,750
	8048/35	N	1,020	1,070	1,170	1,100	4,360
	8049/39	N	1,000	1,350	1,430	1,050	4,830
	80C48/35	C	220	320	230	200	970
	80C49/39	C	710	450	690	830	2,680
	8741	N	80	90	70	90	330
	8748	N	130	180	200	80	590
	8749	N	840	680	730	1,050	3,300
	μPD78XX	N	5,980	5,420	6,140	6,600	24,140
Oki	80C154	C	75	95	350	374	894
	80C48/35	C	125	110	100	93	428
	80C49/39	C	699	734	890	810	3,133
	80C51	C	790	591	660	680	2,721

(Continued)

Table 15 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1987
(Thousands of Units)

	Product	Process	Q1/87	Q2/87	Q3/87	Q4/87	1987
Philips	8021/22	N	35	60	45	32	172
	8048/35	N	75	70	95	45	285
	8049/39	N	430	450	500	430	1,810
	8050/40	N	90	754	856	80	1,780
	8051/31	N	320	460	550	510	1,840
	80C49/39	C	74	120	160	160	514
	80C51/31	C	60	110	210	240	620
	84CXX	C	110	350	380	310	1,150
	84XX	N	2,880	3,190	2,540	2,200	10,810
RCA	1804A	C	5	2	1	0	8
	6805/68HC05	C	190	170	155	290	805
Rockwell	6500/XX	N	980	925	900	1,050	3,855
SGS-Thomson ³	(M) 387X	N	230	175	200	190	795
	(M) 38P7X	N	30	20	20	20	90
	(M) F8	N	56	50	20	10	136
	(S) 387X	N	1,254	1,222	958	488	3,922
	(S) Z8	N	131	163	233	138	665
	(T) 6801/03	N	295	280	276	280	1,131
	(T) 6805	N	530	585	502	565	2,182
	Sharp	SM-Series	C	110	185	110	125
Z8		N	120	225	120	125	590
Siemens	802XX	N	17	12	9	13	51
	8048/35	N	507	541	372	313	1,733
	8051/31	N	812	987	1,147	1,109	4,055
	80515/35	N	164	164	202	238	768
	8052/32	N	316	362	406	347	1,431
Signetics	8048/35	N	48	25	22	16	111
	8049/39	N	488	502	514	496	2,000
	8050/40	N	80	220	218	205	723
	8051/31	N	680	685	700	666	2,731
	8052/32	N	155	450	464	472	1,541
	80C51/31	C	65	69	73	76	283
	83C451	C	1	5	9	12	27
	8400	N	10	11	10	12	43
	8441	C	0	36	44	48	128
TI	87C451	C	0	2	3	5	10
	TMS7000	N	1,100	1,600	1,800	2,100	6,600
Toshiba	8048/35	N	300	310	286	275	1,171
	8049/39	N	500	400	435	425	1,760
	80C48/35	C	400	650	800	1,100	2,950

(Continued)

Table 15 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1987
(Thousands of Units)

	Product	Process	Q1/87	Q2/87	Q3/87	Q4/87	1987
Toshiba	80C49/39	C	800	850	900	1,050	3,600
(Continued)	80C50/40	C	200	225	210	216	851
Zilog	Z8	N	863	863	858	838	3,422
Total 8-Bit MCUs			65,376	70,619	80,807	82,668	299,470

*General Instrument's Microelectronics Division spun off as a separate company under the name Microchip Technology.

†National acquired Fairchild.

‡SGS and Thomson Components merged, forming SGS-Thomson. TCMC (Mostek) was folded into newly established company.

Source: Dataquest (June 1990)

Table 16

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1988
(Thousands of Units)

	Product	Process	Q1/88	Q2/88	Q3/88	Q4/88	1988
AMD	8051/31	N	600	570	540	400	2,110
	8053	N	120	110	140	140	510
	80C51/31	C	180	220	230	425	1,055
	8751	N	45	52	55	65	217
	8753	N	30	33	35	47	145
Fujitsu	8048/35	N	10	10	30	30	80
	8049/39	N	20	22	60	60	162
	8051/31	N	20	23	55	55	153
	80C49/39	C	55	55	120	120	350
	MB897XX	C	320	350	456	505	1,631
Gould/AMI	6801/03	N	7	0	0	0	7
	6805	N	4	0	0	0	4
Harris (GE-SS/RCA) ¹	6805	N	80	100	75	100	355
	68HC05	C	225	350	275	580	1,430
Hitachi	6301	C	2,700	2,900	3,000	2,950	11,550
	6305	C	2,500	2,800	2,950	2,900	11,150
	63701	C	685	695	200	200	1,780
	63705	C	470	480	130	140	1,220
	63P01	C	240	260	270	270	1,040
	63P05	C	325	360	370	370	1,425
	6801/03	N	1,350	1,410	1,450	1,400	5,610
	6805	N	2,100	2,110	2,140	2,000	8,350
	68P01	N	225	235	242	242	944
	68P05	N	230	250	265	265	1,010
Intel	802X	N	10	0	0	0	10
	8048/35	N	300	400	500	300	1,500
	8049/39	N	3,300	3,400	3,100	3,300	13,100
	8050/40	N	400	200	300	300	1,200
	8051/31	N	3,800	3,700	3,400	2,900	13,800
	8052/32	N	1,000	1,300	1,500	2,000	5,800
	80C51/31	C	1,200	1,400	1,600	2,000	6,200
	8748	N	200	200	200	200	800
	8749	N	800	900	1,000	800	3,500
	8751	N	200	300	300	200	1,000
Matra-Harris	8752	C	50	100	100	100	350
	87C51	C	100	100	100	200	500
	8051/31	N	48	24	16	10	98
	8052/32	N	246	200	105	161	712
	80C51/31	C	419	540	620	611	2,190

(Continued)

Table 16 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1988
(Thousands of Units)

	Product	Process	Q1/88	Q2/88	Q3/88	Q4/88	1988
Matra-Harris	80C52/32	C	80	150	208	222	660
(Continued)	83C154	C	0	20	41	55	116
Matsushita	MN1800/70/80	C	460	730	1,030	2,400	4,620
Microchip Technology	PIC1652/54	N	1,000	1,285	1,472	1,485	5,242
	PIC1655/57	N	250	202	221	230	903
	PIC1670/72	N	100	76	60	50	286
	PIC7000/1	N	50	80	0	0	130
	PIC7020/40	N	360	255	0	0	615
	PIC70XX	N	410	276	304	0	990
Mitsubishi	8048/35	N	30	70	60	40	200
	8049/39	N	430	370	250	250	1,300
	8050/40	N	25	49	40	40	154
	80C49/39	C	200	140	150	200	690
	M507XX	C	5,800	6,600	5,000	5,500	22,900
	M509XX	C	5,800	5,800	7,000	6,500	25,100
Motorola	146805	C	1,587	1,694	1,942	1,375	6,598
	6801/03	N	2,045	1,960	2,134	2,114	8,253
	6804	N	1,012	828	1,040	1,020	3,900
	6805	N	5,859	7,032	7,226	6,925	27,042
	68HC05	C	2,004	2,900	4,009	3,763	12,676
	68HC11	C	1,870	2,077	2,513	2,929	9,389
National	8048/35	N	80	100	50	85	315
	8049/39	N	430	500	550	470	1,950
	8050/40	N	650	725	625	210	2,210
	COP800	C	300	300	650	305	1,555
	F8	N	20	10	10	5	45
NCR	6500/1	N	150	250	285	62	747
	6500/11	N	2	200	136	33	371
NEC	8021/22	N	10	10	25	25	70
	8041	N	420	350	260	260	1,290
	8048/35	N	880	400	790	500	2,570
	8049/39	N	730	850	950	830	3,360
	80C48/35	C	210	210	160	160	740
	80C49/39	C	750	950	930	800	3,430
	8741	N	120	90	80	80	370
	8748	N	120	170	180	180	650
	8749	N	320	510	500	490	1,820
	uPD78XX	N	7,050	8,300	8,430	8,430	32,210
	uPD78XXX	N	0	0	200	300	500
	V25	C	0	0	2	3	5

(Continued)

Table 16 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1988
(Thousands of Units)

	Product	Process	Q1/88	Q2/88	Q3/88	Q4/88	1988
Oki	00C48/35	C	90	95	90	110	385
	80C154	C	350	360	420	500	1,630
	80C49/39	C	800	812	890	960	3,462
	80C51/31	C	650	670	950	830	3,100
Philips	8021/22	N	10	5	0	0	15
	8048/35	N	60	60	45	50	215
	8049/39	N	420	370	220	220	1,230
	8050/40	N	95	60	30	30	215
	8051/31	N	450	350	300	300	1,400
	80C49/39	C	170	170	160	165	665
	80C51/31	C	270	250	350	350	1,220
	84CXX	C	350	550	800	820	2,520
	84XX	N	2,150	2,400	2,500	2,530	9,580
	Rockwell	6500/XX	N	1,800	1,930	200	300
Sanyo	LC86XXX	C	0	0	400	400	800
	LM88XX	N	0	0	100	100	200
SGS-Thomson	387X	N	1,097	848	760	531	3,236
	38P7X	N	18	26	33	33	110
	6801/03	N	362	494	408	565	1,829
	6805	N	754	739	644	660	2,797
	F8	N	11	10	0	0	21
	Z8	N	136	148	89	71	444
Sharp	CUSTOM	C	0	0	80	90	170
	SM-Series	C	125	100	100	100	425
	Z8	N	125	100	100	100	425
Siemens	802XX	N	24	11	12	19	66
	8048/35	N	325	387	308	325	1,345
	8051/31	N	1,176	1,477	1,231	1,239	5,123
	80515/35	N	304	411	536	723	1,974
	8052/32	N	643	722	565	712	2,642
Signetics	8048/35	N	8	0	0	10	18
	8049/39	N	497	634	718	600	2,449
	8050/40	N	273	126	149	150	698
	8051/31	N	950	1,057	1,081	950	4,038
	8052/32	N	220	468	790	480	1,958
	80C451	C	26	6	13	10	55
	80C51/31	C	299	415	499	440	1,653
	8400	N	10	0	0	0	10
	8441	C	16	2	0	0	18
87C451	C	4	0	5	6	15	

(Continued)

Table 16 (Continued)

Estimated 8-Bit Microcontroller Unit Shipments by Quarter for 1988
(Thousands of Units)

	Product	Process	Q1/88	Q2/88	Q3/88	Q4/88	1988
Sony	SPC700	C	0	0	300	500	800
TI	TMS7000	N	1,600	2,200	2,600	2,400	8,800
Toshiba	8048/35	N	220	220	225	225	890
	8049/39	N	370	370	375	370	1,485
	80C48/35	C	800	800	800	800	3,200
	80C49/39	C	1,000	1,050	1,050	1,100	4,200
	80C50/40	C	200	200	205	215	820
	TLCS-90	C	50	150	250	400	850
Zilog	Z8	N	925	1,300	1,500	1,300	5,025
Total 8-Bit MCUs			86,461	95,231	98,323	97,461	377,476

¹Harris acquired GE Solid State and RCA, 1988.
Source: Dataquest (June 1990)

Table 17

Estimated 8-bit Microcontroller Unit Shipment by Quarter for 1989
(Thousands of Units)

	Product	Process	Q1/89	Q2/89	Q3/89	Q4/89	1989
AMD	8051/31	N	525	530	450	250	1,755
	80515/535	N	6	10	8	10	34
	8053	N	270	300	350	300	1,220
	80C51/31	C	450	350	360	390	1,550
	80C521/321	C	30	100	130	175	435
	80C5292/3292	C	100	275	310	355	1,040
	8751	N	75	75	75	70	295
	8753	N	25	45	45	40	155
	89C51	C	0	10	30	65	105
Fujitsu	8048/35	N	30	30	30	30	120
	8049/39	N	70	70	70	70	280
	8051/31	N	60	60	60	60	240
	80C49/39	C	130	140	150	165	585
	MB897XX	C	522	528	550	600	2,200
Harris (GE-SS/RCA)	6805	N	53	88	65	60	266
	68HC05	C	355	600	750	1,000	2,705
Hitachi	6301	C	3,200	3,300	3,500	4,000	14,000
	6305	C	2,800	2,700	2,600	2,500	10,600
	63701	C	300	400	550	700	1,950
	63705	C	160	180	200	230	770
	63P01	C	275	280	285	290	1,130
	63P05	C	380	385	390	395	1,550
	6801/03	N	1,300	1,100	1,000	900	4,300
	6805	N	1,800	1,600	1,300	1,000	5,700
	68P01	N	245	250	255	260	1,010
	68P05	N	265	250	240	220	975
Intel	H8/532	C	10	40	50	100	200
	8048/35	N	400	290	250	200	1,140
	8049/39	N	2,400	2,320	2,000	2,000	8,720
	8050/40	N	400	320	450	350	1,520
	8051/31	N	2,600	3,120	3,500	3,000	12,220
	8052/32	N	2,200	2,460	3,200	2,700	10,560
	80C51/31	C	2,100	2,800	3,000	2,900	10,800
	8748	N	200	180	175	135	690
	8749	N	600	670	1,000	815	3,085
	8751	N	200	230	265	210	905
	8752	C	90	40	210	340	680
87C51	C	100	260	200	260	820	

(Continued)

Table 17 (Continued)

Estimated 8-bit Microcontroller Unit Shipment by Quarter for 1989
(Thousands of Units)

	Product	Process	Q1/89	Q2/89	Q3/89	Q4/89	1989
Matra-Harris	8052/32	N	150	100	60	0	310
	80C51/31	C	625	640	690	655	2,610
	80C52/32	C	370	590	875	1,110	2,945
	80C752	C	0	0	10	35	45
	83C154	C	55	75	70	90	290
Matsushita	MN1800/70/80	C	2,300	2,600	4,000	3,000	11,900
Microchip Technology	PIC1652/54	N	1,192	1,232	992	649	4,065
	PIC1670/72	N	88	81	58	42	269
	PIC16C52/C54	C	168	350	355	456	1,329
	PIC70XX	N	66	64	54	91	275
Mitsubishi	8048/35	N	40	40	40	10	130
	8049/39	N	200	150	150	150	650
	8050/40	N	40	40	40	40	160
	80C49/39	C	250	250	250	200	950
	M507XX	C	5,000	5,000	5,000	5,500	20,500
	M509XX	C	6,000	5,500	6,000	6,500	24,000
Motorola	146805	C	1,224	1,120	1,228	1,230	4,802
	6801/03	N	2,101	1,988	1,600	1,500	7,189
	6804	N	1,402	1,578	1,100	900	4,980
	6805	N	7,316	6,825	7,000	7,000	28,141
	68HC05	C	5,256	7,613	14,000	17,700	44,569
	68HC11	C	3,404	4,116	4,500	5,200	17,220
National	8048/35	N	65	40	75	65	245
	8049/39	N	450	800	1,300	1,500	4,050
	8050/40	N	375	350	350	360	1,435
	COP800	C	710	720	1,550	1,950	4,930
NCR	6500/1	N	0	2	71	257	330
	6500/11	N	6	2	0	6	14
NEC	8021/22	N	10	7	5	3	25
	8041	N	270	270	230	230	1,000
	8048/35	N	600	550	500	470	2,120
	8049/39	N	900	910	800	750	3,360
	80C48/35	C	240	270	300	290	1,100
	80C49/39	C	800	850	900	890	3,440
	8741	N	165	170	185	182	702
	8748	N	150	155	160	155	620
	8749	N	440	445	400	350	1,635
	uPD78XX	N	8,800	8,900	9,200	9,200	36,100
	uPD78XXX	N	500	600	700	900	2,700
	V25	C	10	30	40	70	150

(Continued)

Table 17 (Continued)

Estimated 8-bit Microcontroller Unit Shipment by Quarter for 1989
(Thousands of Units)

	Product	Process	Q1/89	Q2/89	Q3/89	Q4/89	1989
Oki	80C154	C	750	1,000	1,200	1,500	4,450
	80C48/35	C	100	100	100	100	400
	80C49/39	C	900	700	500	500	2,600
Philips	80C51/31	C	700	800	700	760	2,960
	8048/35	N	50	55	65	60	230
	8049/39	N	230	255	275	272	1,032
	8050/40	N	20	25	35	30	110
	8051/31	N	275	295	320	315	1,205
	80C49/39	C	170	180	190	185	725
	80C51/31	C	355	415	475	470	1,715
	84CXX	C	825	830	840	835	3,330
	84XX	N	2,550	2,600	2,650	2,645	10,445
	Rockwell	6500/XX	N	980	1,200	850	1,150
Sanyo	LC86XXX	C	400	400	500	600	1,900
	LM88XX	N	100	100	100	100	400
SGS-Thomson	387X	N	1,047	986	912	816	3,761
	38P7X	N	18	20	13	12	63
	6801/03	N	475	370	268	315	1,428
	6805	N	915	1,248	1,245	1,890	5,298
	Z8	N	202	301	212	140	855
Sharp	CUSTOM	C	220	300	320	360	1,200
	SM-Series	C	300	380	400	420	1,500
	Z8	N	130	133	137	135	535
Siemens	802XX	N	9	4	15	11	39
	8048/35	N	334	409	320	160	1,223
	8051/31	N	1,175	1,010	1,260	1,500	4,945
	80515/35	N	733	950	900	990	3,573
	8052/32	N	752	739	795	1,234	3,520
Signetics	8049/39	N	526	810	988	1,473	3,797
	8051/31	N	635	691	830	765	2,921
	8052/32	N	1,000	1,156	1,052	825	4,033
	80C451	C	7	8	6	23	44
	80C51/31	C	912	1,256	1,303	779	4,250
	87C451	C	27	16	25	30	98
	87C51	C	125	103	43	45	316
	87C751	C	10	24	14	29	77
Sony	SPC700	C	1,000	1,300	1,500	1,600	5,400
TI	TMS370	C	1	25	50	100	176
	TMS7000	N	2,800	2,500	2,500	2,000	9,800

(Continued)

Table 17 (Continued)

Estimated 8-bit Microcontroller Unit Shipment by Quarter for 1989
(Thousands of Units)

	Product	Process	Q1/89	Q2/89	Q3/89	Q4/89	1989
Toshiba	8048/35	N	170	130	100	100	500
	8049/39	N	250	190	150	150	740
	80C48/35	C	700	500	250	250	1,700
	80C49/39	C	950	800	750	750	3,250
	80C50/40	C	220	200	240	240	900
	TLCS-870	C	0	0	30	100	130
	TLCS-90	C	500	650	800	900	2,850
Zilog	Z8	N	1,500	1,600	1,500	1,900	6,500
Total 8-Bit MCUs			102,512	109,173	120,619	126,395	458,699

Source: Dataquest (June 1990)

Chapter 3

16-Bit Microcontrollers

The following section includes historical 16-bit microcontroller unit shipments by year, manufacturer, product name, and process technology.

The tables are organized as follows:

Table 1	Estimated 16-Bit Microcontroller Unit Shipments by Manufacturer, 1980-1984
Table 2	Estimated 16-Bit Microcontroller Unit Shipments by Manufacturer, 1985-1989
Table 3	Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1980
Table 4	Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1981
Table 5	Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1982
Table 6	Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1983
Table 7	Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1984
Table 8	Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1985
Table 9	Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1986
Table 10	Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1987
Table 11	Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1988
Table 12	Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1989

Table 1

**Estimated 16-Bit Microcontroller Unit Shipments by Manufacturer
1980-1984
(Thousands of Units)**

	Product	Process	1980	1981	1982	1983	1984
Intel	8096	N	0	0	0	0	1
Texas Instruments	9940	N	8	36	50	89	122
Total 16-Bit MCUs			8	36	50	89	123

Source: Dataquest (June 1990)

Table 2

**Estimated 16-Bit Microcontroller Unit Shipments by Manufacturer
(Thousands of Units)**

	Product	Process	1985	1986	1987	1988	1989
Hitachi	H16	C	0	0	0	0	35
Intel	8096	N	145	269	548	1,670	3,105
	8098	N	0	0	0	80	30
	80C196	C	0	0	0	60	215
Mitsubishi	M377XX	C	0	0	0	0	180
Mostek ¹	68200	N	12	129	110	0	0
National	HPC	C	0	0	25	250	625
NEC	V35	C	0	0	2	9	18
SGS-Thomson ¹	68200	N	0	0	0	64	57
TI	9940	N	75	1	0	0	0
Various ²	8061	C	0	0	2,626	3,328	3,173
Total 16-Bit MCUs			232	399	3,311	5,461	7,438

¹Thomson Components acquired Mostek Corporation in 1985. Thomson and SGS merged in 1987.²The 8061 is a custom-designed 16-bit microcontroller for Ford Motor Company. It is supplied by several semiconductor companies, including Intel. Estimated production of the 8061 is based on production of Ford automobiles and trucks. (No attempt to estimate production prior to 1987 has been made.) Source: Dataquest (June 1990)

Table 3

**Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1980
(Thousands of Units)**

	Product	Process	Q1/80	Q2/80	Q3/80	Q4/80	1980
Texas Instruments	9940	N	1	1	2	4	8
Total 16-Bit MCUs			1	1	2	4	8

Source: Dataquest (June 1990)

Table 4

Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1981
(Thousands of Units)

	Product	Process	Q1/81	Q2/81	Q3/81	Q4/81	1981
Texas Instruments	9940	N	6	10	10	10	36
Total 16-Bit MCUs			6	10	10	10	36

Source: Dataquest (June 1990)

Table 5

Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1982
(Thousands of Units)

	Product	Process	Q1/82	Q2/82	Q3/82	Q4/82	1982
Texas Instruments	9940	N	10	10	15	15	50
Total 16-Bit MCUs			10	10	15	15	50

Source: Dataquest (June 1990)

Table 6

Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1983
(Thousands of Units)

	Product	Process	Q1/83	Q2/83	Q3/83	Q4/83	1983
Texas Instruments	9940	N	20	22	22	25	89
Total 16-Bit MCUs			20	22	22	25	89

Source: Dataquest (June 1990)

Table 7

Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1984
(Thousands of Units)

	Product	Process	Q1/84	Q2/84	Q3/84	Q4/84	1984
Intel	8096	N	0	0	0	1	1
Texas Instruments	9940	N	30	30	31	31	122
Total 16-Bit MCUs			30	30	31	32	123

Source: Dataquest (June 1990)

Table 8

Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1985
(Thousands of Units)

	Product	Process	Q1/85	Q2/85	Q3/85	Q4/85	1985
Intel	8096	N	25	40	40	40	145
TCMC (Mostek) ¹	68200	N	0	0	1	11	12
Texas Instruments	9940	N	25	15	15	20	75
Total 16-Bit MCUs			50	55	56	71	232

¹Thomson Components acquired Mostek Corporation in 1985, forming Thomson Components Mostek Corporation (TCMC).
Source: Dataquest (June 1990)

Table 9

Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1986
(Thousands of Units)

	Product	Process	Q1/86	Q2/86	Q3/86	Q4/86	1986
Intel	8096	N	58	66	73	72	269
TCMC (Mostek)	68200	N	18	32	44	35	129
Texas Instruments	9940	N	1	0	0	0	1
Total 16-Bit MCUs			77	98	117	107	399

Source: Dataquest (June 1990)

Table 10

Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1987
(Thousands of Units)

	Product	Process	Q1/87	Q2/87	Q3/87	Q4/87	1987
Intel	8096	N	86	82	130	250	548
National	HPC	C	0	0	0	25	25
NEC	V35	C	0	0	0	2	2
SGS-Thomson	68200	N	10	20	55	25	110
Various ¹	8061	C	685	570	645	726	2,626
Total 16-Bit MCUs			781	672	830	1,028	3,311

¹The 8061 is a custom-designed 16-bit microcontroller for Ford Motor Company. It is supplied by several semiconductor companies, including Intel. Estimated production of the 8061 based on production of Ford automobiles and trucks. (No attempt to estimate production prior to 1987 has been made.)
Source: Dataquest (June 1990)

Table 11

Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1988
(Thousands of Units)

	Product	Process	Q1/88	Q2/88	Q3/88	Q4/88	1988
Intel	8096	N	300	400	370	600	1,670
	8098	N	0	20	30	30	80
	80C196	C	10	20	10	20	60
National	HPC	C	40	55	80	75	250
NEC	V35	C	2	2	2	3	9
SGS-Thomson	68200	N	16	19	0	29	64
Various ¹	8061	C	902	940	656	830	3,328
Total 16-Bit MCUs			1,270	1,456	1,148	1,587	5,461

¹The 8061 is a custom-designed 16-bit microcontroller for Ford Motor Company. It is supplied by several semiconductor companies including Intel. Estimated production of the 8061 is based on production of Ford automobiles and trucks.
Source: Dataquest (June 1990)

Table 12

Estimated 16-Bit Microcontroller Unit Shipments by Quarter for 1989
(Thousands of Units)

	Product	Process	Q1/89	Q2/89	Q3/89	Q4/89	1989
Hitachi	H16	C	5	5	10	15	35
Intel	8096	N	600	780	825	900	3,105
	8098	N	30	0	0	0	30
	80C196	C	20	40	55	100	215
Mitsubishi	M377XX	C	10	20	50	100	180
National	HPC	C	105	90	180	250	625
NEC	V35	C	4	4	5	5	18
SGS-Thomson	68200	N	19	26	1	11	57
Various ¹	8061	C	867	909	619	778	3,173
Total 16-Bit MCUs			1,660	1,874	1,745	2,159	7,438

¹The 8061 is a custom-designed 16-bit microcontroller for Ford Motor Company. It is supplied by several semiconductor companies, including Intel. Estimated production of the 8061 is based on production of Ford automobiles and trucks.
Source: Dataquest (June 1990)

Dataquest

DB a company of
The Dun & Bradstreet Corporation

Dataquest Research and Sales Offices:

Dataquest Incorporated

1290 Ridder Park Drive
San Jose, California 95131-2398
Phone: (408) 437-8000
Telex: 171973
Fax: (408) 437-0292

Technology Products Group

Phone: (800) 624-3280

Dataquest Incorporated

Invitational Computer Conferences Division

3151 Airway Avenue, C-2
Costa Mesa, California 92626
Phone: (714) 957-0171
Telex: 5101002189 ICCDQ
Fax: (714) 957-0903

Dataquest Incorporated

Ledgeway Group

430 Bedford Street
Suite 340
Lexington, MA 02173
Phone: (617) 862-8500
Fax: (617) 862-8207

Dataquest Australia

Suite 1, Century Plaza
80 Berry Street
North Sydney, NSW 2060
Australia
Phone: (02) 959 4544
Telex: 25468
Fax: (02) 929 0635

Dataquest Boston

1740 Massachusetts Ave.
Boxborough, MA 01719-2209
Phone: (508) 264-4373
Telex: 171973
Fax: (508) 635 0183

Dataquest Europe GmbH

Rosenkavalierplatz 17
D-8000 Munich 81
West Germany
Phone: (089) 91 1064
Telex: 5218070
Fax: (089) 91 2189

Dataquest Europe Limited

Roussel House, Broadwater Park
Denham, Uxbridge, Middx UB9 5HP
England
Phone: 0895 835050
Telex: 266195
Fax: 0895 835260/1/2

Dataquest Europe SA

Tour Gallieni 2
36, avenue Gallieni
93175 Bagnolet Cedex
France
Phone: (1) 48 97 31 00
Telex: 233 263
Fax: (1) 48 97 34 00

Dataquest Hong Kong

Rm. 401, Connaught Comm. Bldg.
185 Wanchai Rd
Wanchai, Hong Kong
Phone: 8387336
Telex: 80587
Fax: 5722375

Dataquest Israel

59 Mishmar Ha'yarden Street
Tel Aviv, Israel 69865
or
P.O. Box 18198
Tel Aviv, Israel
Phone: 52 913937
Telex: 341118
Fax: 52 32865

Dataquest Japan Limited

Shinkawa Sanko Building
1-3-17 Shinkawa, Chuo-ku
Tokyo 104 Japan
Phone: (03) 5566 0411
Fax: (03) 5566-0425

Dataquest Korea

Daehung Bldg., Room 505
648 23 Yeoksam-dong
Kangnam-gu
Seoul, Korea 135
Phone: (02) 552-2332
Fax: (02) 552-2661

Dataquest Singapore

4012 Ang Mo Kio Industrial Park 1
Ave. 10, #03-10 to #03-12
Singapore 2056
Phone: 4597181
Telex: 38257
Fax: 4563129

Dataquest Taiwan

Room 801/8th Floor
Ever Spring Building
147, Sect. 2, Chien Kuo N. Rd.
Taipei, Taiwan R.O.C. 104
Phone: (02) 501-7960
Telex: 27459
Fax: (02) 505-4265

Dataquest West Germany

In der Schneithohl 17
6242 Kronberg 2
West Germany
Phone: 06173/61685
Telex: 418089
Fax: 06173/67901

Microcontroller Market Analysis

1975-1989

/

/

/

/

/

/

/

/

/

Dataquest

DB a company of
The Dun & Bradstreet Corporation

A Semiconductor Industry Service Report

Published by Dataquest Incorporated

The content of this report represents our interpretation and analysis of information generally available to the public or released by knowledgeable individuals in the subject industry, but is not guaranteed as to accuracy or completeness. It does not contain material provided to us in confidence by our clients.

Printed in the United States of America. All rights reserved. No part of this publication may be reproduced, stored in retrieval systems, or transmitted, in any form or by any means—mechanical, electronic, photocopying, duplicating, microfilming, videotape, or otherwise—without the prior written permission of the publisher.

© 1990 Dataquest Incorporated
September 1990

Table of Contents

This booklet is divided into four major sections.

Chapter 1	Microcontroller Market Overview	1
Chapter 2	4-Bit Microcontrollers	15
Chapter 3	8-Bit Microcontrollers	25
Chapter 4	16-Bit Microcontrollers	43

Chapter 1

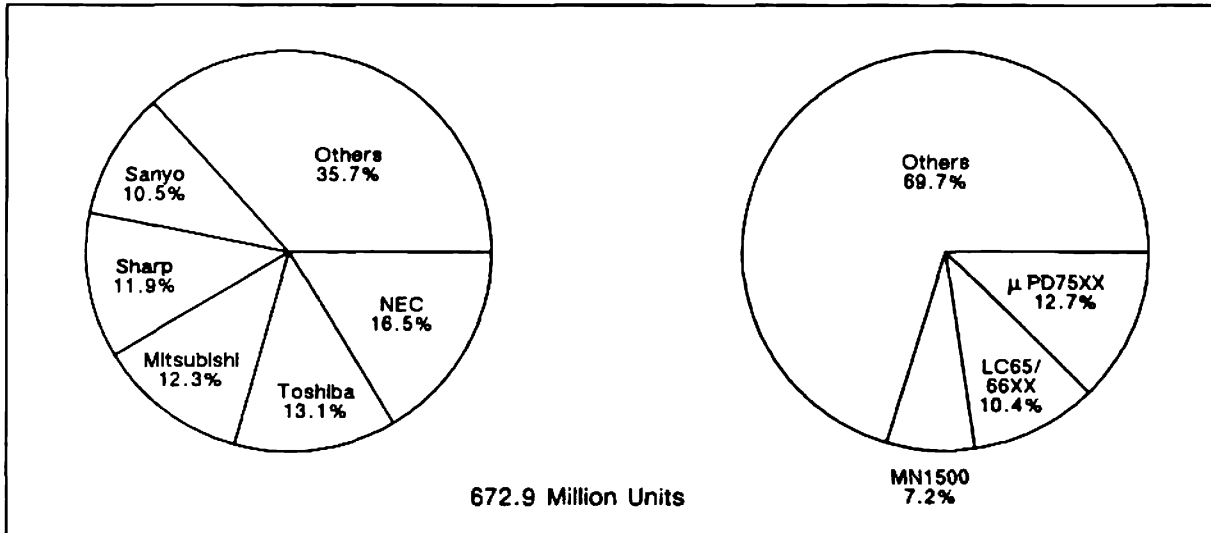
Microcontroller Market Overview

The tables and figures in this section are organized as follows:

Figure 1	Estimated Market Share of Leading Manufacturers and Product Types for 4-Bit Microcontrollers, 1989
Figure 2	Estimated Market Share of Leading Manufacturers and Product Types for 8-Bit Microcontrollers, 1989
Figure 3	Estimated Market Share of Leading Manufacturers and Product Types for 16-Bit Microcontrollers, 1989
Table 1	Estimated Market Share by Word Length for Microcontrollers, 1975-1979
Table 2	Estimated Market Share by Word Length for Microcontrollers, 1980-1984
Table 3	Estimated Market Share by Word Length for Microcontrollers, 1985-1989
Figure 4	Estimated Market Share by Word Length for 4-, 8-, and 16-Bit Microcontrollers, 1980-1989
Table 4	Estimated Market Share by Region for 4-, 8-, and 16-Bit Microcontrollers, 1975-1979
Table 5	Estimated Market Share by Region for 4-, 8-, and 16-Bit Microcontrollers, 1980-1984
Table 6	Estimated Market Share by Region for 4-, 8-, and 16-Bit Microcontrollers, 1985-1989
Figure 5	Estimated Market Share by Region for 4-, 8-, and 16-Bit Microcontrollers, 1989
Table 7	Estimated Market Share by Process Technology for 4-, 8-, and 16-Bit Microcontrollers, 1975-1979
Table 8	Estimated Market Share by Process Technology for 4-, 8-, and 16-Bit Microcontrollers, 1980-1984
Table 9	Estimated Market Share by Process Technology for 4-, 8-, and 16-Bit Microcontrollers, 1985-1989
Figure 6	Estimated Market Share by Process Technology for 4-, 8-, and 16-Bit Microcontrollers, 1989

Figure 1

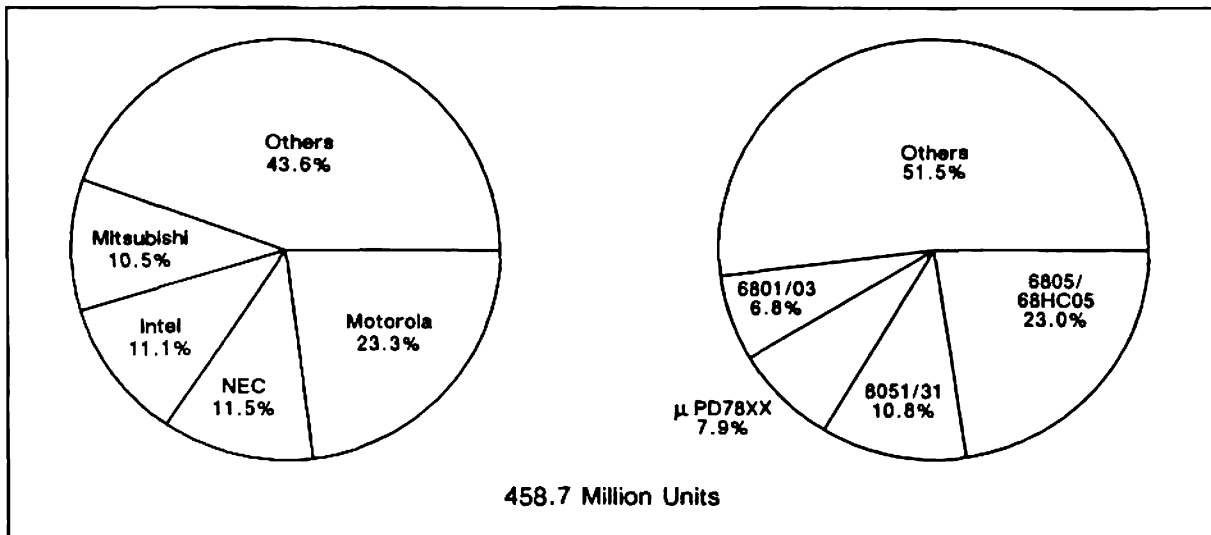
Estimated Market Share of Leading Manufacturers and Product Types for 4-Bit Microcontrollers 1989



Source: Dataquest (September 1990)

Figure 2

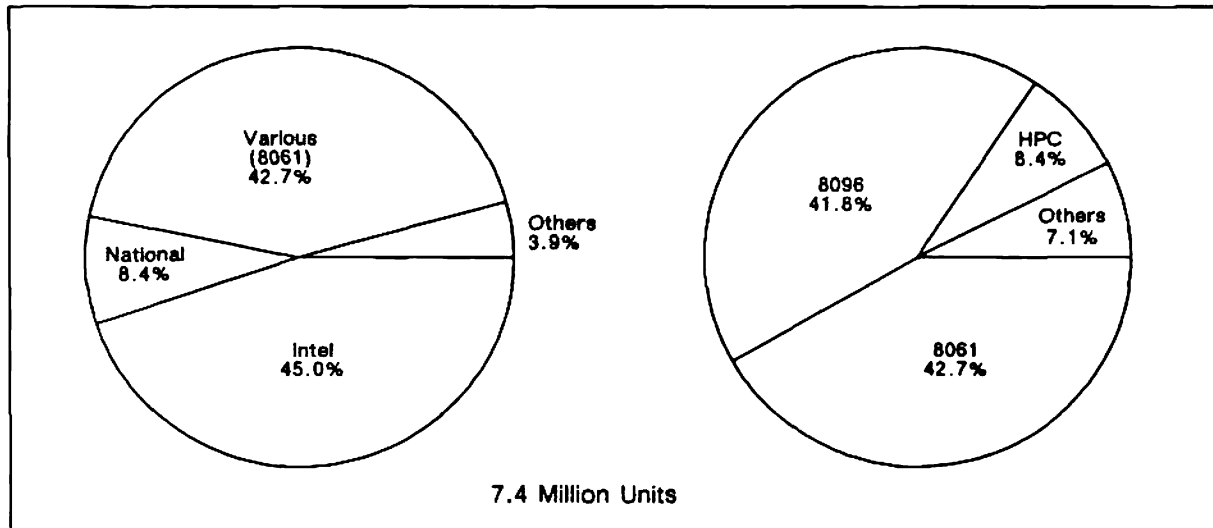
Estimated Market Share of Leading Manufacturers and Product Types for 8-Bit Microcontrollers 1989



Source: Dataquest (September 1990)

Figure 3

Estimated Market Share of Leading Manufacturers
and Product Types for 16-Bit Microcontrollers
1989



Source: Dataquest (September 1990)

Table 1

Estimated Market Share by Word Length
for Microcontrollers
1975-1979
(Thousands of Units)

	1975	1976	1977	1978	1979
4-Bit					
Shipments	500	760	3,400	15,959	50,525
Percent	94.0	75.2	79.3	87.8	81.3
8-Bit					
Shipments	32	251	885	2,218	11,592
Percent	6.0	24.8	20.7	12.2	18.7
16-Bit					
Shipments	0	0	0	0	5
Percent	0	0	0	0	*
Total Shipments	532	1,011	4,285	18,177	62,122

*Calculated value is less than 0.1 percent.
Source: Dataquest (September 1990)

Table 2

**Estimated Market Share by Word Length
for Microcontrollers
1980-1984
(Thousands of Units)**

	1980	1981	1982	1983	1984
4-Bit					
Shipments	96,080	133,549	158,183	171,945	193,435
Percent	81.5	79.3	74.5	65.5	54.2
8-Bit					
Shipments	21,740	34,931	54,114	90,615	163,510
Percent	18.5	20.7	25.5	34.5	45.8
16-Bit					
Shipments	8	36	50	89	123
Percent	*	*	*	*	*
Total Shipments	117,828	168,516	212,347	262,649	357,068

*Calculated value is less than 0.1 percent.
Source: Dataquest (September 1990)

Table 3

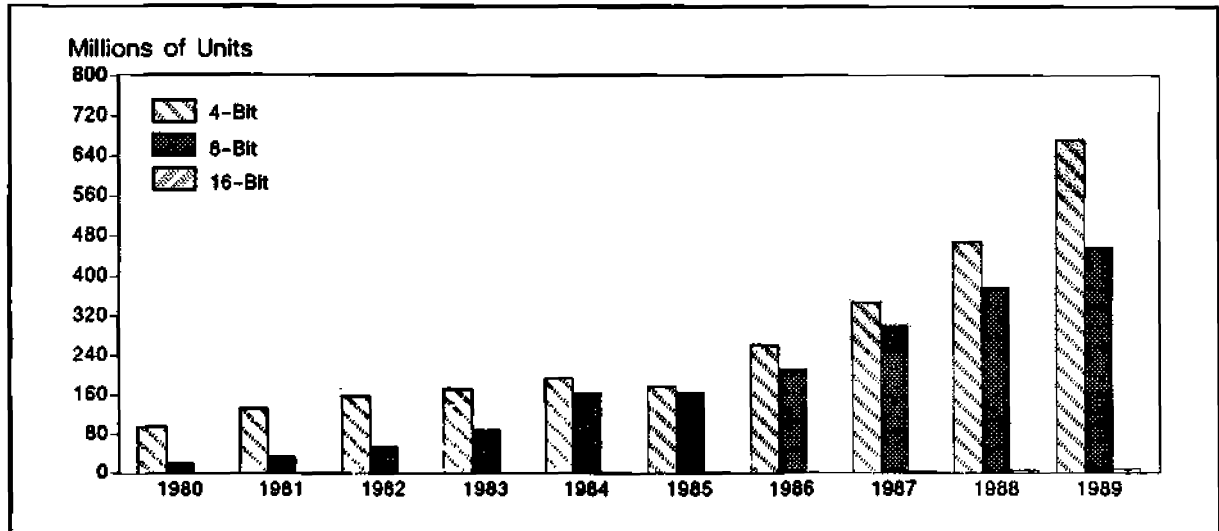
**Estimated Market Share by Word Length
for Microcontrollers
1985-1989
(Thousands of Units)**

	1985	1986	1987	1988	1989
4-Bit					
Shipments	177,038	261,883	347,812	468,445	672,860
Percent	51.9	55.1	53.5	55.0	59.1
8-Bit					
Shipments	163,599	212,931	299,470	377,476	458,699
Percent	48.0	44.8	46.0	44.3	40.3
16-Bit					
Shipments	232	399	3,311	5,461	7,438
Percent	0.1	0.1	0.5	0.6	0.7
Total Shipments	340,869	475,213	650,593	851,382	1,138,997

Source: Dataquest (September 1990)

Figure 4

Estimated Market Share by Word Length
for 4-, 8-, and 16-Bit Microcontrollers
1980-1989



Source: Dataquest (September 1990)

Table 4

**Estimated Market Share by Region
for 4-, 8-, and 16-Bit Microcontrollers
1975-1979
(Thousands of Units)**

	1975	1976	1977	1978	1979
4-Bit Shipments	500	760	3,400	15,959	50,525
US Companies (%)	100.0	100.0	100.0	88.0	73.8
Japanese Companies (%)	0	0	0	12.0	26.2
European Companies (%)	0	0	0	0	0
8-Bit Shipments	32	251	885	2,218	11,592
US Companies (%)	100.0	100.0	100.0	99.3	91.1
Japanese Companies (%)	0	0	0	0.7	8.5
European Companies (%)	0	0	0	0	0.4
16-Bit Shipments	0	0	0	0	5
US Companies (%)	0	0	0	0	100.0
Japanese Companies (%)	0	0	0	0	0
European Companies (%)	0	0	0	0	0
Total Shipments	532	1,011	4,285	18,177	62,122
US Companies (%)	100.0	100.0	100.0	89.4	77.1
Japanese Companies (%)	0	0	0	10.6	22.9
European Companies (%)	0	0	0	0	0.1

Source: Dataquest (September 1990)

Table 5

**Estimated Market Share by Region
for 4-, 8-, and 16-Bit Microcontrollers
1980-1984
(Thousands of Units)**

	1980	1981	1982	1983	1984
4-Bit Shipments	96,080	133,549	158,183	171,945	193,435
US Companies (%)	65.2	40.5	28.2	0.3	19.2
Japanese Companies (%)	34.8	59.5	71.7	79.2	79.3
European Companies (%)	0	0	0.1	0.5	1.4
8-Bit Shipments	21,740	34,931	54,114	90,615	163,510
US Companies (%)	73.3	68.3	61.0	57.6	51.7
Japanese Companies (%)	15.5	20.1	27.1	31.3	36.6
European Companies (%)	11.2	11.7	11.8	11.0	11.7
16-Bit Shipments	8	36	50	89	123
US Companies (%)	100.0	100.0	100.0	100.0	100.0
Japanese Companies (%)	0	0	0	0	0
European Companies (%)	0	0	0	0	0
Total Shipments	117,828	168,516	212,347	262,649	357,068
US Companies (%)	66.7	46.2	36.6	33.2	34.1
Japanese Companies (%)	31.2	51.3	60.3	62.7	59.7
European Companies (%)	2.1	2.4	3.1	4.1	6.2

Source: Dataquest (September 1990)

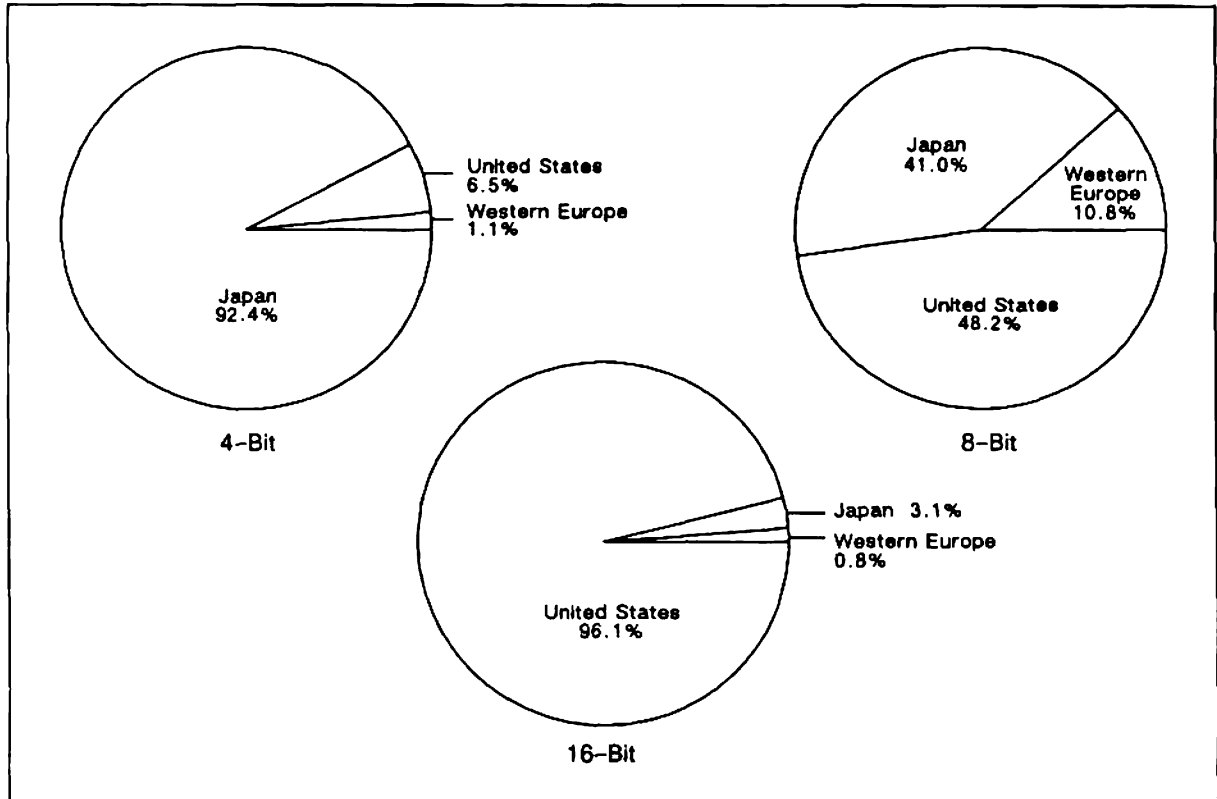
Table 6
Estimated Market Share by Region
for 4-, 8-, and 16-Bit Microcontrollers
1985-1989
(Thousands of Units)

	1985	1986	1987	1988	1989
4-Bit Shipments	177,038	261,883	347,812	468,445	672,860
US Companies (%)	16.3	18.5	13.3	8.6	6.5
Japanese Companies (%)	80.8	79.1	84.6	89.6	92.3
European Companies (%)	3.0	2.4	2.2	1.9	1.1
8-Bit Shipments	163,599	212,931	299,470	377,476	458,699
US Companies (%)	42.7	36.6	39.3	43.9	48.1
Japanese Companies (%)	43.2	47.4	47.7	45.4	41.0
European Companies (%)	14.1	16.0	13.0	10.7	10.8
16-Bit Shipments	232	399	3,311	5,461	7,438
US Companies (%)	94.8	67.7	96.6	98.6	96.1
Japanese Companies (%)	0	0	0.1	0.2	3.1
European Companies (%)	5.2	32.3	3.3	1.2	0.8
Total Shipments	340,869	475,213	650,593	851,382	1,138,997
US Companies (%)	29.0	26.7	25.7	24.8	23.9
Japanese Companies (%)	62.7	64.8	67.2	69.4	71.1
European Companies (%)	8.3	8.5	7.1	5.8	5.0

Source: Dataquest (September 1990)

Figure 5

Estimated Market Share by Region
for 4-, 8-, and 16-Bit Microcontrollers
1989



Source: Dataquest (September 1990)

Table 7
Estimated Market Share by Process Technology
for 4-, 8-, and 16-Bit Microcontrollers
1975-1979
(Thousands of Units)

	1975	1976	1977	1978	1979
4-Bit	500	760	3,400	15,959	50,525
Percent PMOS	100.0	100.0	100.0	80.4	75.3
Percent NMOS	0	0	0	14.9	14.9
Percent CMOS	0	0	0	4.7	9.8
8-Bit	32	251	885	2,218	11,592
Percent NMOS	100.0	100.0	100.0	100.0	100.0
Percent CMOS	0	0	0	0	0
16-Bit	0	0	0	0	5
Percent NMOS	0	0	0	0	100.0
Percent CMOS	0	0	0	0	0
Total Shipments	532	1,011	4,285	18,177	62,122
Percent PMOS	94.0	75.2	79.3	70.6	61.2
Percent NMOS	6.0	24.8	20.7	25.3	30.8
Percent CMOS	0	0	0	4.2	8.0

Source: Dataquest (September 1990)

Table 8
Estimated Market Share by Process Technology
for 4-, 8-, and 16-Bit Microcontrollers
1980-1984
(Thousands of Units)

	1980	1981	1982	1983	1984
4-Bit Shipments	96,080	133,549	158,183	171,945	193,435
Percent PMOS	66.3	52.0	35.2	22.0	14.9
Percent NMOS	14.4	19.4	23.5	30.5	32.2
Percent CMOS	19.3	28.6	41.3	47.5	52.9
8-Bit Shipments	21,740	34,931	54,114	90,615	163,510
Percent NMOS	100.0	99.7	96.8	91.4	90.0
Percent CMOS	0	0.3	3.2	8.6	10.0
16-Bit Shipments	8	36	50	89	123
Percent NMOS	100.0	100.0	100.0	100.0	100.0
Percent CMOS	0	0	0	0	0
Total Shipments	117,828	168,516	212,347	262,649	357,068
Percent PMOS	54.1	41.2	26.2	14.4	8.1
Percent NMOS	30.2	36.1	42.2	51.5	58.7
Percent CMOS	15.8	22.7	31.6	34.1	33.3

Source: Dataquest (September 1990)

Table 9

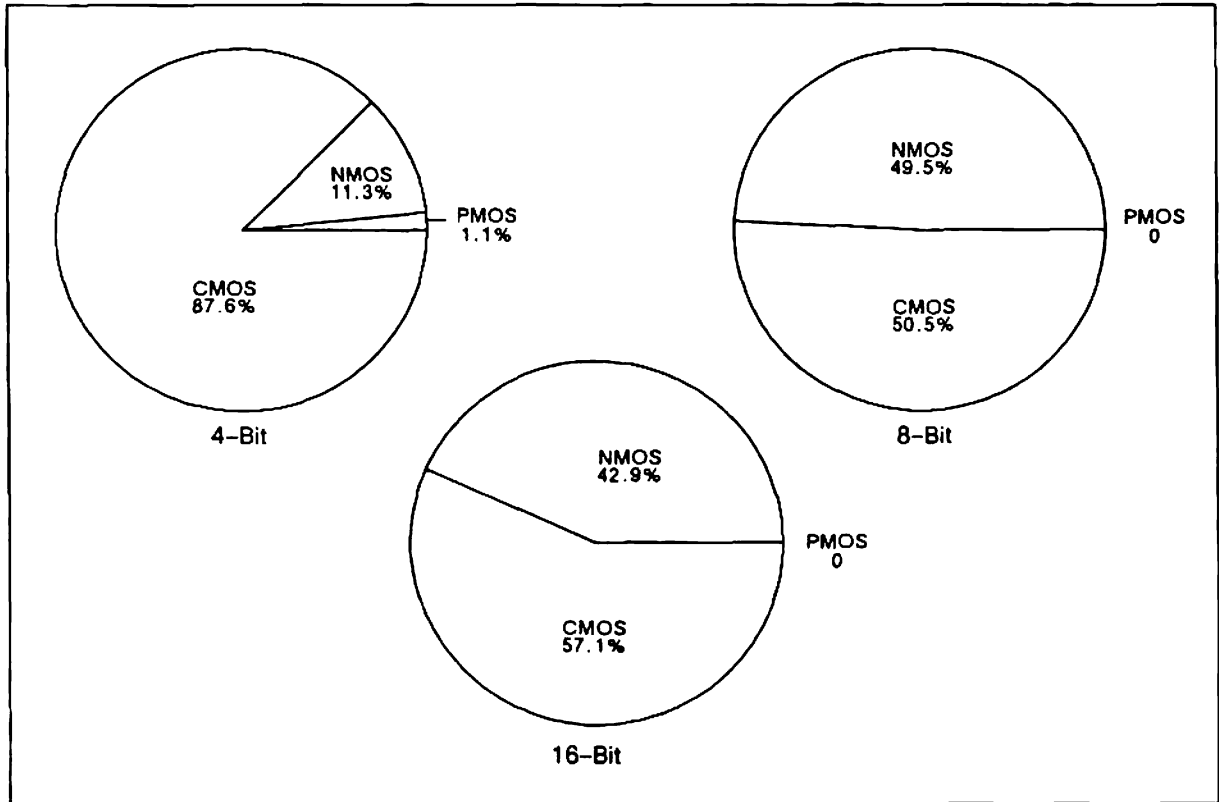
**Estimated Market Share by Process Technology
for 4-, 8-, and 16-Bit Microcontrollers
1985-1989
(Thousands of Units)**

	1985	1986	1987	1988	1989
4-Bit Shipments	177,038	261,883	347,812	468,445	672,860
Percent PMOS	10.0	5.1	2.8	1.3	1.1
Percent NMOS	34.8	31.0	27.4	14.5	11.3
Percent CMOS	55.2	63.9	69.8	84.2	87.7
8-Bit Shipments	163,599	212,931	299,470	377,476	458,699
Percent NMOS	79.5	71.4	65.4	58.6	49.5
Percent CMOS	20.5	28.6	34.6	41.4	50.5
16-Bit Shipments	232	399	3,311	5,461	7,438
Percent NMOS	100.0	100.0	19.9	33.2	42.9
Percent CMOS	0	0	80.1	66.8	57.1
Total Shipments	340,869	475,213	650,593	851,382	1,138,997
Percent PMOS	5.2	2.8	1.5	0.7	0.6
Percent NMOS	56.3	49.1	44.8	34.2	26.9
Percent CMOS	38.5	48.1	53.7	65.1	72.5

Source: Dataquest (September 1989)

Figure 6

Estimated Market Share by Process Technology
for 4-, 8-, and 16-Bit Microcontrollers
1989



Source: Dataquest (September 1990)

Chapter 2

4-Bit Microcontrollers

The tables and figures in this section are organized as follows:

Table 1	Estimated Market Share by Manufacturer for 4-Bit Microcontrollers, 1975-1979
Table 2	Estimated Market Share by Manufacturer for 4-Bit Microcontrollers, 1980-1984
Table 3	Estimated Market Share by Manufacturer for 4-Bit Microcontrollers, 1985-1989
Figure 1	Estimated Market Share by Manufacturer for 4-Bit Microcontrollers, 1988 and 1989
Table 4	Estimated Market Share by Region for 4-Bit Microcontrollers, 1975-1979
Table 5	Estimated Market Share by Region for 4-Bit Microcontrollers, 1980-1984
Table 6	Estimated Market Share by Region for 4-Bit Microcontrollers, 1985-1989
Figure 2	Estimated Market Share by Region for 4-Bit Microcontrollers, 1980-1989
Table 7	Estimated Market Share by Product Type for 4-Bit Microcontrollers, 1975-1979
Table 8	Estimated Market Share by Product Type for 4-Bit Microcontrollers, 1980-1984
Table 9	Estimated Market Share by Product Type for 4-Bit Microcontrollers, 1985-1989
Figure 3	Estimated Market Share by Product Type for 4-Bit Microcontrollers, 1988 and 1989
Table 10	Estimated Market Share by Process Technology for 4-Bit Microcontrollers, 1975-1979
Table 11	Estimated Market Share by Process Technology for 4-Bit Microcontrollers, 1980-1984
Table 12	Estimated Market Share by Process Technology for 4-Bit Microcontrollers, 1985-1989
Figure 4	Estimated Market Share by Process Technology for 4-Bit Microcontrollers, 1980-1989

Table 1
 Estimated Market Share* by Manufacturer
 for 4-Bit Microcontrollers
 1975-1979
 (Percentage)

Manufacturer	1975	1976	1977	1978	1979
Gould/AMI	0	0	0	0.2	2.8
Hitachi	0	0	0	2.6	1.3
Matsushita	0	0	0	0	8.7
Motorola	0	0	0	0.1	0.6
National	0	0	0	14.6	11.1
NEC	0	0	0	9.4	15.4
Rockwell	90.0	59.2	16.9	14.2	7.7
Sharp	0	0	0	0	0.7
Texas Instruments	10.0	40.8	83.1	58.9	51.7
Total	100.0	100.0	100.0	100.0	100.0

*Based on units shipped
 Source: Dataquest (September 1990)

Table 2
 Estimated Market Share* by Manufacturer
 for 4-Bit Microcontrollers
 1980-1984
 (Percentage)

Manufacturer	1980	1981	1982	1983	1984
Eurotechnique	0	0	0.1	0.5	0
Fujitsu	0.2	8.4	8.3	6.2	4.6
Gould Semiconductor	1.2	0.3	0.4	0.1	0
Hitachi	1.5	14.2	13.0	12.0	11.6
Matsushita	10.7	9.4	10.2	14.4	15.0
Motorola	0.2	0.1	0.1	0.1	0
National	12.0	8.6	10.2	12.2	13.8
NEC	15.4	17.2	21.3	21.0	25.0
Oki	0.1	0.4	1.5	3.2	3.3
Rockwell	6.0	1.9	1.1	1.0	1.1
SGS-Thomson	0	0	0	0	1.4
Sharp	6.9	9.9	7.8	7.5	7.7
Texas Instruments	45.8	29.6	16.4	6.9	4.3
Toshiba	0	0	9.5	14.9	12.2
Total	100.0	100.0	100.0	100.0	100.0

*Based on units shipped
 Source: Dataquest (September 1990)

Table 3
 Estimated Market Share by Manufacturer
 for 4-Bit Microcontrollers
 1985-1989
 (Percentage)

	1985	1986	1987	1988	1989
Fujitsu	4.4	3.8	4.0	5.1	5.7
Hitachi	12.6	8.4	16.7	10.1	8.6
Matsushita	18.0	17.2	16.1	13.4	8.9
Mitsubishi	0	10.6	12.7	11.4	12.3
Motorola	0	0	0	0	0
National	13.3	11.9	9.2	6.5	5.0
NEC	23.4	19.7	19.6	18.8	16.5
Oki	3.7	2.8	1.9	1.6	1.5
Rockwell	0.8	0.4	0.2	0.1	*
Sanyo	0	0	0	6.7	10.5
SGS-Thomson	3.0	2.4	2.2	1.9	1.1
Sharp	5.9	3.5	2.7	6.6	11.9
Sony	0	0	0	1.8	3.4
Texas Instruments	2.2	6.1	3.9	2.0	1.5
Toshiba	12.7	13.1	10.8	14.1	13.1
Total	100.0	100.0	100.0	100.0	100.0

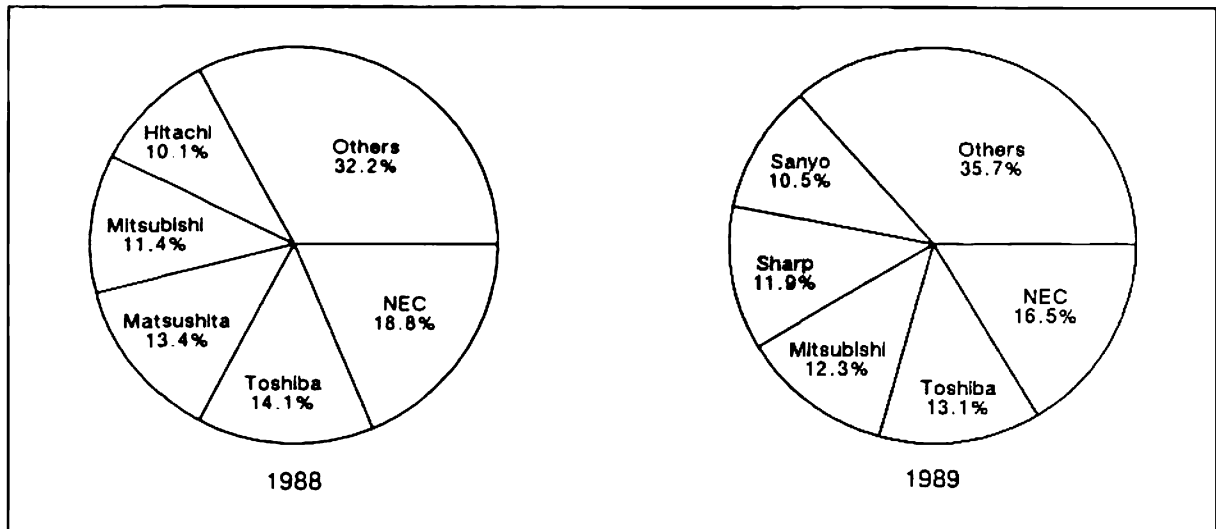
*Calculated value is less than 0.1 percent.

Note: Totals for 1986, 1987, and 1988 have been adjusted to remove Dataquest's previous estimates for unsurveyed companies. Totals now reflect actual survey results. Additionally, because of the receipt of new information, 1988 numbers have been restated for many Japanese companies. Columns may not add to totals shown because of rounding.

Source: Dataquest (September 1990)

Figure 1

**Estimated Market Share by Manufacturer
for 4-Bit Microcontrollers
1988 and 1989**



Source: Dataquest (September 1990)

Table 4

**Estimated Market Share by Region
for 4-Bit Microcontrollers
1975-1979
(Thousands of Units)**

Region	1975	1976	1977	1978	1979
United States					
Shipments	500	760	3,400	14,049	37,310
Percent	100.0	100.0	100.0	88.0	73.8
Japan					
Shipments	0	0	0	1,910	13,215
Percent	0	0	0	12.0	26.2
Europe					
Shipments	0	0	0	0	0
Percent	0	0	0	0	0
Total Shipments	500	760	3,400	15,959	50,525

Source: Dataquest (September 1990)

Table 5
Estimated Market Share by Region
for 4-Bit Microcontrollers
1980-1984
(Thousands of Units)

Region	1980	1981	1982	1983	1984
United States					
Shipments	62,660	54,039	44,553	34,945	37,215
Percent	65.2	40.5	28.2	20.3	19.2
Japan					
Shipments	33,420	79,510	113,440	136,160	153,430
Percent	34.8	59.5	71.7	79.2	79.3
Europe					
Shipments	0	0	190	840	2,790
Percent	0	0	0.1	0.5	1.4
Total Shipments	96,080	133,549	158,183	171,945	193,435

Source: Dataquest (September 1990)

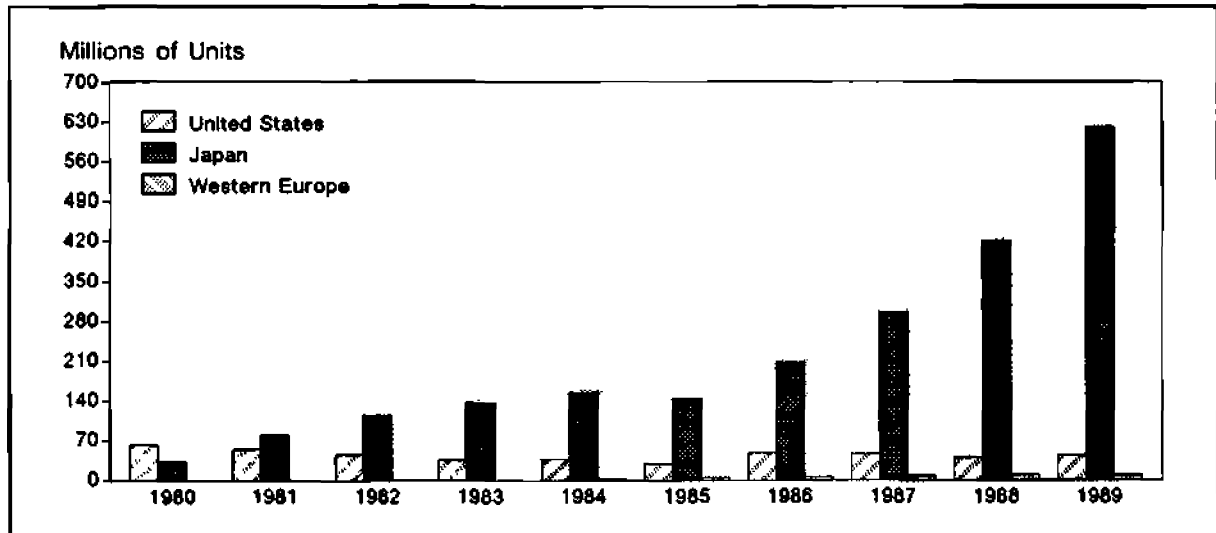
Table 6
Estimated Market Share by Region
for 4-Bit Microcontrollers
1985-1989
(Thousands of Units)

Region	1985	1986	1987	1988	1989
United States					
Shipments	28,804	48,458	46,160	40,075	44,035
Percent	16.3	18.5	13.3	8.6	6.5
Japan					
Shipments	142,992	207,095	294,137	419,520	621,180
Percent	80.8	79.1	84.6	89.6	92.3
Europe					
Shipments	5,242	6,330	7,515	8,850	7,645
Percent	3.0	2.4	2.2	1.9	1.1
Total Shipments	177,038	261,883	347,812	468,445	672,860

Source: Dataquest (September 1990)

Figure 2

**Estimated Market Share by Region
for 4-Bit Microcontrollers
1980-1989**



Source: Dataquest (September 1990)

Table 7

**Estimated Market Share* by Product Type
for 4-Bit Microcontrollers
1975-1979
(Percentage)**

	1975	1976	1977	1978	1979
TMS1000	10.0	40.8	83.1	58.9	51.7
uCOM-4	0	0	0	9.4	15.4
COPS	0	0	0	14.6	11.1
MN1400	0	0	0	0	8.7
PPS-4	90.0	59.2	16.9	14.3	7.7
S2000	0	0	0	0.2	2.8
HMCS-40	0	0	0	2.6	1.3
SM-3	0	0	0	0	0.7
14100	0	0	0	0.1	0.6
Total	100.0	100.0	100.0	100.0	100.0

*Based on units shipped

Source: Dataquest (September 1990)

Table 8
Estimated Market Share* by Product Type
for 4-Bit Microcontrollers
1980-1984
(Percentage)

	1980	1981	1982	1983	1984
uPD75XX	0	2.4	5.1	8.8	16.3
COPS	12.0	8.6	10.4	12.7	15.2
HMCS-40	1.5	14.2	13.0	12.0	11.6
MN1400	10.7	8.4	9.2	10.7	10.5
uCOM-4	15.4	14.8	16.2	12.2	8.8
SM-5	5.0	8.0	5.9	6.0	6.3
MN1500	0	0.9	1.0	3.7	4.4
TMS1000	45.8	29.6	16.4	6.9	4.3
TLCS-43	0	0	2.1	5.4	4.1
Series-40	0.1	0.4	1.5	3.2	3.3
TLCS-47	0	0	0.4	1.8	3.3
MB884X	0	6.9	6.3	4.4	3.2
T-Series	0	0	5.2	5.7	3.1
TLCS-46	0	0	1.8	2.1	1.7
B885X	0.2	1.5	2.0	1.8	1.4
PPS-4	6.0	1.9	1.1	1.0	1.1
SM-4	1.2	1.2	1.2	1.0	1.0
SM-3	0.6	0.7	0.6	0.5	0.4
141000	0.2	0.1	0.1	0.1	0
S2000	1.2	0.3	0.4	0.1	0
Total	100.0	100.0	100.0	100.0	100.0

*Based on units shipped
Source: Dataquest (September 1990)

Table 9
 Estimated Market Share by Product Type
 for 4-Bit Microcontrollers
 1985-1989
 (Percentage)

Product	1985	1986	1987	1988	1989
uPD75XX	17.8	16.0	13.7	13.6	12.7
LC65/66XX	0	0	0	6.6	10.4
MN1500	6.4	10.6	12.1	10.6	7.2
Sharp (Custom)	0	0	0	1.9	6.5
TLCS-47	4.4	8.6	6.7	9.0	6.5
HMCS-400	0	0	9.2	6.1	6.4
COPS	16.2	14.4	11.4	8.4	6.1
SM (4-Bit)	5.9	3.5	2.7	4.6	5.4
M5046X/56X	0	0	3.8	4.2	4.8
SPC500	0	0	0	1.8	3.4
TLCS-470	0	0.2	0.4	*	3.2
uPD75XX	0	1.5	4.8	3.8	2.9
M5072/76	0	0	4.3	3.0	2.8
M5043X/44X	0	0	4.0	2.8	2.7
MB8850X	0	0	0.1	1.6	2.3
T Series	3.2	1.8	1.8	3.0	2.3
HMCS-40	12.6	8.4	7.4	3.9	2.2
M509X	0	0	0.6	1.4	1.9
TMS1000	2.2	6.1	3.9	2.0	1.5
MB885X	1.2	1.3	1.1	1.3	1.5
Series-40	3.7	2.8	1.9	1.6	1.5
MB884X	3.2	2.5	2.1	1.5	1.1
MN1700	0	0	0.6	1.0	1.0
TLCS-42	0.7	1.5	1.2	1.0	1.0
uCOM-4	5.6	2.2	1.1	1.4	0.9
MN1400	11.6	6.7	3.4	1.8	0.6
MB8840X	0	0	0.5	0.4	0.4
MB882XX	0	0	0.2	0.3	0.2
TLCS-43	3.2	1.0	0.6	1.0	0.1
MB887XX	0	0	0	0	0.1
LM64XX	0	0	0	0.1	0.1
MB886XX	0	0	0	0	*
PPS-4	0.8	0.4	0.2	0.1	*
TLCS-46	1.2	0.2	0.1	0.1	*
M50XX	0	10.6	0	0	0
141000	*	0	0	0	0
Total	100.0	100.0	100.0	100.0	100.0

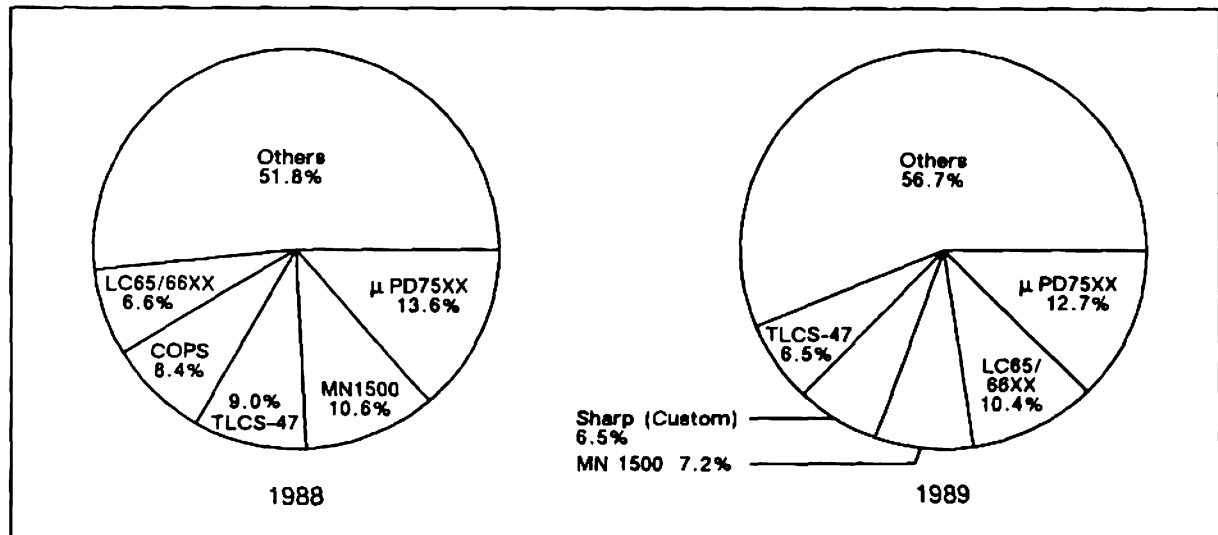
*Calculated value is less than 0.1 percent.

Note: Columns may not add to totals shown because of rounding.

Source: Dataquest (September 1990)

Figure 3

Estimated Market Share by Product Type
for 4-Bit Microcontrollers
1988 and 1989



Source: Dataquest (September 1990)

Table 10

Estimated Market Share by Process Technology
for 4-Bit Microcontrollers
1975-1979
(Thousands of Units)

	1975	1976	1977	1978	1979
NMOS					
Shipments	0	0	0	2,375	7,530
Percent	0	0	0	14.9	14.9
CMOS					
Shipments	0	0	0	755	4,961
Percent	0	0	0	4.7	9.8
PMOS					
Shipments	500	760	3,400	12,829	38,034
Percent	100	100	100	80.4	75.3
Total Shipments	500	760	3,400	15,959	50,525

Source: Dataquest (September 1990)

Table 11
Estimated Market Share by Process Technology
for 4-Bit Microcontrollers
1980-1984
(Thousands of Units)

	1980	1981	1982	1983	1984
NMOS					
Shipments	13,813	25,970	37,167	52,468	62,240
Percent	14.4	19.4	23.5	30.5	32.2
CMOS					
Shipments	18,574	38,129	65,382	81,638	102,358
Percent	19.3	28.6	41.3	47.5	52.9
PMOS					
Shipments	63,693	69,450	55,634	37,839	28,837
Percent	66.3	52.0	35.2	22.0	14.9
Total Shipments	96,080	133,549	158,183	171,945	193,435

Source: Dataquest (September 1990)

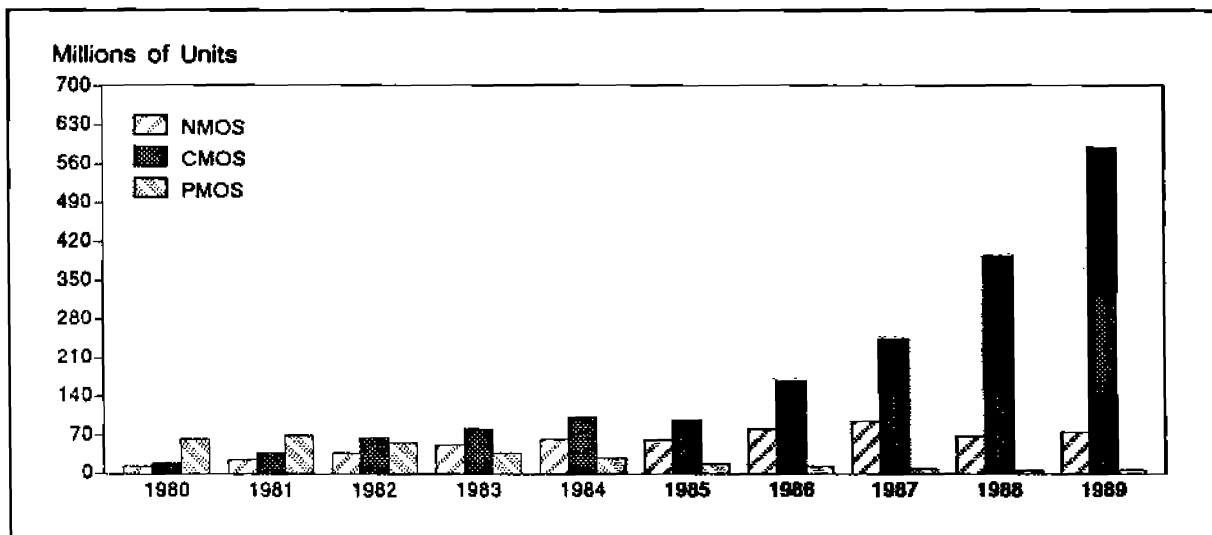
Table 12
Estimated Market Share by Process Technology
for 4-Bit Microcontrollers
1985-1989
(Thousands of Units)

	1985	1986	1987	1988	1989
NMOS					
Shipments	61,576	81,153	95,288	68,117	75,845
Percent	34.8	31.0	27.4	14.5	11.3
CMOS					
Shipments	97,694	167,357	242,840	394,336	589,780
Percent	55.2	63.9	69.8	84.2	87.7
PMOS					
Shipments	17,768	13,373	9,684	5,992	7,235
Percent	10.0	5.1	2.8	1.3	1.1
Total Shipments	177,038	261,883	347,812	468,445	672,860

Note: Columns may not add to totals shown because of rounding.
Source: Dataquest (September 1990)

Figure 4

Estimated Market Share by Process Technology
for 4-Bit Microcontrollers
1980-1989



Source: Dataquest (September 1990)

Chapter 3

8-Bit Microcontrollers

The tables and figures in this section are organized as follows:

Table 1	Estimated Market Share by Manufacturer for 8-Bit Microcontrollers, 1975-1979
Table 2	Estimated Market Share by Manufacturer for 8-Bit Microcontrollers, 1980-1984
Table 3	Estimated Market Share by Manufacturer for 8-Bit Microcontrollers, 1985-1989
Figure 1	Estimated Market Share by Manufacturer for 8-Bit Microcontrollers, 1988 and 1989
Table 4	Estimated Market Share by Region for 8-Bit Microcontrollers, 1975-1979
Table 5	Estimated Market Share by Region for 8-Bit Microcontrollers, 1980-1984
Table 6	Estimated Market Share by Region for 8-Bit Microcontrollers, 1985-1989
Figure 2	Estimated Market Share by Region for 8-Bit Microcontrollers, 1980-1989
Table 7	Estimated Market Share by Product Type for 8-Bit Microcontrollers, 1975-1979
Table 8	Estimated Market Share by Product Type for 8-Bit Microcontrollers, 1980-1984
Table 9	Estimated Market Share by Product Type for 8-Bit Microcontrollers, 1985-1989
Figure 3	Estimated Market Share by Product Type for 8-Bit Microcontrollers, 1988 and 1989
Table 10	Estimated Market Share by Instruction Set for 8-Bit Microcontrollers, 1975-1979
Table 11	Estimated Market Share by Instruction Set for 8-Bit Microcontrollers, 1980-1984
Table 12	Estimated Market Share by Instruction Set for 8-Bit Microcontrollers, 1985-1989
Figure 4	Estimated Market Share by Instruction Set for 8-Bit Microcontrollers, 1988 and 1989
Table 13	Estimated Market Share by Process Technology for 8-Bit Microcontrollers, 1975-1979
Table 14	Estimated Market Share by Process Technology for 8-Bit Microcontrollers, 1980-1984
Table 15	Estimated Market Share by Process Technology for 8-Bit Microcontrollers, 1985-1989
Figure 5	Estimated Market Share by Process Technology for 8-Bit Microcontrollers, 1980-1989
Table 16	Estimated Market Share by Process Technology by Region for 8-Bit Microcontrollers, 1975-1979
Table 17	Estimated Market Share by Process Technology by Region for 8-Bit Microcontrollers, 1980-1984
Table 18	Estimated Market Share by Process Technology by Region for 8-Bit Microcontrollers, 1985-1989
Figure 6	Estimated Market Share by Process Technology by Region for 8-Bit Microcontrollers, 1989

Table 1
Estimated Market Share by Manufacturer
for 8-Bit Microcontrollers
1975-1979
(Percentage)

	1975	1976	1977	1978	1979
AMD	0	0	0	0	0.2
Fairchild	84.4	72.1	75.7	29.4	10.0
General Instrument	0	0	0	20.3	35.4
Intel	0	0	11.9	23.4	22.6
Mostek	15.6	27.9	12.4	23.0	16.7
Motorola	0	0	0	3.2	4.5
National	0	0	0	0	0.1
NEC	0	0	0	0.7	8.5
Rockwell	0	0	0	0	0.1
SGS	0	0	0	0	0.4
Signetics	0	0	0	0	1.6
Total 8-Bit MCUs	100.0	100.0	100.0	100.0	100.0

Note: Columns may not add to totals shown because of rounding.
Source: Dataquest (September 1990)

Table 2
Estimated Market Share by Manufacturer
for 8-Bit Microcontrollers
1980-1984
(Percentage)

	1980	1981	1982	1983	1984
AMD	0.6	0.8	0.8	0.7	1.4
Eurotechnique	0	0	0.3	0.4	0
Fairchild	11.1	11.0	4.8	2.3	0.7
Fujitsu	2.1	3.8	2.6	1.8	1.2
Gould Semiconductor	0	0	0.1	0.4	1.0
Hitachi	0	1.4	3.3	4.1	4.3
Intel	27.3	23.9	21.5	17.9	16.7
Matra-Harris	0	0	0	0.1	0.5
Microchip Technology (GI)	25.8	11.8	7.8	7.3	5.8
Mostek (SGS-Thomson)	10.6	7.4	3.8	2.0	1.1
Motorola	5.9	14.0	17.5	18.8	14.0
National	1.4	4.7	5.8	4.8	4.3
NCR	0	0	0	0.2	0.4
NEC	13.4	13.9	18.1	19.3	22.4
Oki	0	0	0.3	1.1	1.5
Philips	0.1	1.1	2.3	4.0	6.3
Rockwell	0.5	1.0	0.6	1.0	0.8
SGS (SGS-Thomson)	0.4	0.7	1.3	1.3	1.0
Sharp	0	0	0.3	1.1	1.2
Siemens	0.1	2.4	4.0	3.1	2.4
Signetics	0.6	0	0.3	2.3	4.7
Synertek	0	0	0.2	0.1	0
Texas Instruments	0	0.1	0.5	0.8	0.6
Thomson (SGS-Thomson)	0	0	0	0.2	0.5
Toshiba	0	1.0	2.4	3.9	6.0
Zilog	0.1	1.0	1.3	0.9	1.3
Total 8-Bit MCUs	100.0	100.0	100.0	100.0	100.0

Note: Columns may not add to totals shown because of rounding.
Source: Dataquest (September 1990)

Table 3
Estimated Market Share by Manufacturer
for 8-Bit Microcontrollers,
1985-1989
(Percentage)

	1985	1986	1987	1988	1989
AMD	1.0	0.9	1.0	1.1	1.4
Fairchild ¹	0.4	0.1	0	0	0
Fujitsu	0.5	0.8	1.7	0.6	0.7
Gould/AMI	0.6	0.1	0	0	0
Harris (GE-SS/RCA) ²	0.1	0.2	0.3	0.5	0.6
Hitachi	4.8	8.6	11.1	11.7	9.2
Intel	9.1	8.3	10.8	12.7	11.1
Matra-Harris	0.9	1.0	1.0	1.0	1.4
Matsushita	0.1	0.2	0.4	1.2	2.6
Microchip Tech.	4.6	2.5	2.8	2.2	1.3
Mitsubishi	9.2	14.0	14.0	13.3	10.1
Mostek ³	0.8	0.7	0.3	0	0
Motorola	16.2	15.8	15.7	18.0	23.3
National	3.4	1.6	1.5	1.6	2.3
NCR	0.4	0.5	0.1	0.3	0.1
NEC	19.0	17.6	14.4	12.5	11.5
Oki	1.5	2.4	2.4	2.3	2.3
Philips	7.3	8.6	6.3	4.5	4.1
Rockwell	0.8	1.2	1.3	1.1	0.9
Sanyo	0	0	0	0.3	0.5
SGS ³	1.5	2.5	1.5	0	0
SGS-Thomson ³	0	0	0	2.2	2.5
Sharp	0.3	0.3	0.4	0.3	0.7
Siemens	2.7	2.2	2.7	3.0	2.9
Signetics	3.9	2.8	2.5	2.9	3.4
Sony	0	0	0	0.2	1.2
Texas Instruments	0.9	1.2	2.2	2.3	2.2
Thomson ³	0.9	1.0	1.1	0	0
Toshiba	7.7	3.4	3.5	3.0	2.2
Zilog	1.3	1.5	1.1	1.3	1.4
	100.0	100.0	100.0	100.0	100.0

¹Fairchild merged with National in 1988.

²Harris acquired GE/RCA during 1988.

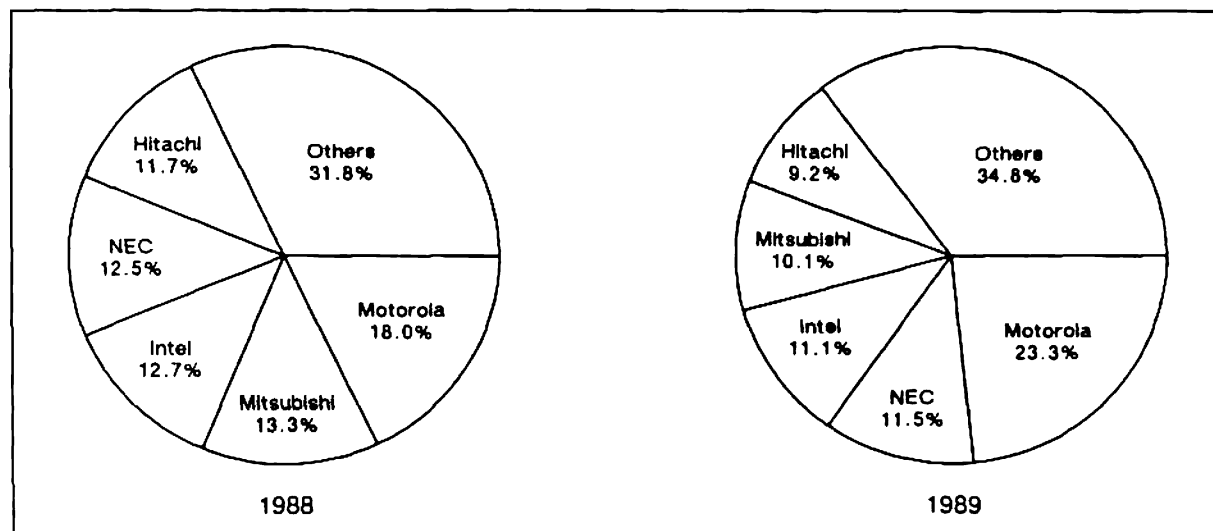
³Mostek, SGS, and Thomson all merged to become SGS-Thomson in 1988.

Note: Columns may not add to totals shown because of rounding.

Source: Dataquest (September 1990)

Figure 1

Estimated Market Share by Manufacturer
for 8-Bit Microcontrollers
1988 and 1989



Source: Dataquest (September 1990)

Table 4

Estimated Market Share by Region
for 8-Bit Microcontrollers
1975-1979
(Thousands of Units)

	1975	1976	1977	1978	1979
United States					
Shipments	32	251	885	2,203	10,557
Percent	100.0	100.0	100.0	100.0	91.1
Japan					
Shipments	0	0	0	15	985
Percent	0	0	0	0.7	8.5
Western Europe					
Shipments	0	0	0	0	50
Percent	0	0	0	0	0.4
Total Shipments	32	251	885	2,218	11,592

Source: Dataquest (September 1990)

Table 5
Estimated Market Share by Region
for 8-Bit Microcontrollers
1980-1984
(Thousands of Units)

	1980	1981	1982	1983	1984
United States					
Shipments	15,926	23,847	33,035	52,227	84,484
Percent	73.3	68.3	61.0	57.6	51.7
Japan					
Shipments	3,370	7,014	14,689	28,400	59,835
Percent	15.5	20.1	27.1	31.3	36.6
Western Europe					
Shipments	2,444	4,070	6,390	9,988	19,191
Percent	11.2	11.7	11.8	11.0	11.7
Total Shipments	21,740	34,931	54,114	90,615	163,510

Source: Dataquest (September 1990)

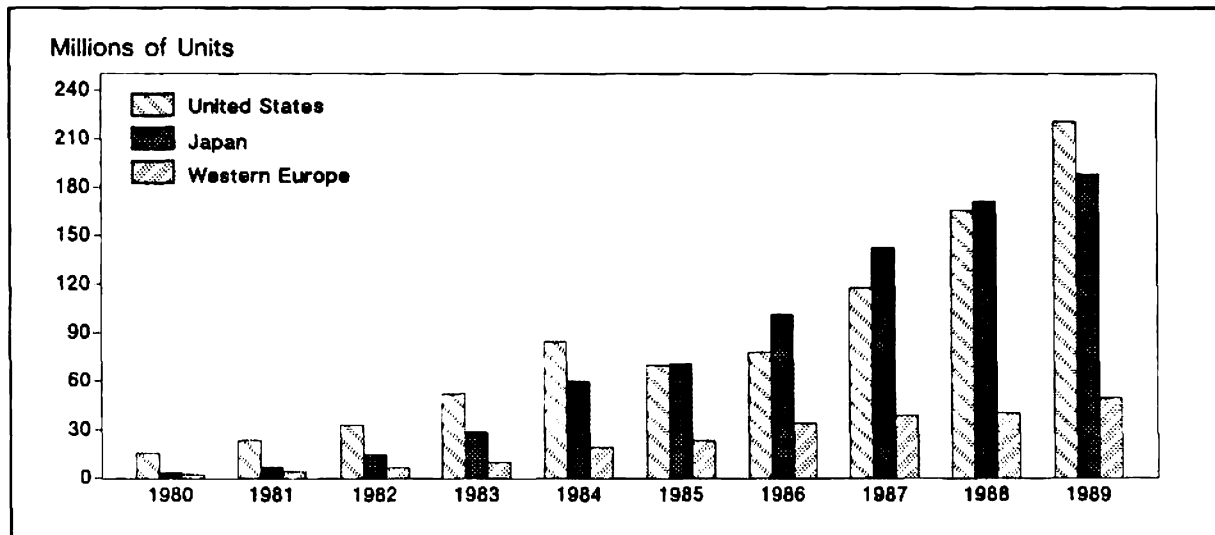
Table 6
Estimated Market Share by Region
for 8-Bit Microcontrollers
1985-1989
(Thousands of Units)

	1985	1986	1987	1988	1989
United States					
Shipments	69,920	77,899	117,816	165,777	220,735
Percent	42.7	36.6	39.3	43.9	48.1
Japan					
Shipments	70,618	100,943	142,845	171,276	188,267
Percent	43.2	47.4	47.7	45.4	41.0
Western Europe					
Shipments	23,061	34,089	38,809	40,423	49,697
Percent	14.1	16.0	13.0	10.7	10.8
Total Shipments	163,599	212,931	299,470	377,476	458,699

Source: Dataquest (September 1990)

Figure 2

**Estimated Market Share by Region
for 8-Bit Microcontrollers
1980-1989**



Source: Dataquest (September 1990)

Table 7

**Estimated Market Share by Product Type
for 8-Bit Microcontrollers
1975-1979
(Percentage)**

Product	1975	1976	1977	1978	1979
802X	0	0	0	0	1.4
8048/35	0	0	11.9	23.7	27.5
8049/39	0	0	0	0.5	4.1
6500/XX	0	0	0	0	0.1
6801/03	0	0	0	0	0.1
6805	0	0	0	0	*
F8/387X	100.0	100.0	88.1	55.6	31.5
PIC1650	0	0	0	20.3	35.4
	100.0	100.0	100.0	100.0	100.0

*Calculated value is less than 0.1 percent.

Note: Columns may not add to totals shown because of rounding. NMOS/CMOS/EPROM versions are included in the market share numbers for each product type.

Source: Dataquest (September 1990)

Table 8
Estimated Market Share by Product Type
for 8-Bit Microcontrollers
1980-1984

	1980	1981	1982	1983	1984
6500/XX	0.5	1.0	0.6	1.3	1.2
6801/03	0.9	5.4	7.8	10.5	7.8
6804	0	0	0	0	*
6805/68HC05	2.1	8.0	12.4	12.8	11.9
68HC11	0	0	0	0	*
8048/35	31.6	26.4	25.0	20.9	20.7
8049/39	9.7	15.0	18.5	18.4	18.9
8050/40	0.2	1.2	1.9	2.4	1.7
8051/31	0	0.1	1.0	6.1	13.6
8052/32	0	0	0	*	0.1
84XX	0	0	0.1	2.1	1.5
F8/387X	25.1	21.2	10.7	5.7	2.7
PIC165X	25.8	11.8	7.8	4.3	3.6
TMS7000	0	0.1	0.5	0.8	0.7
uPD78XX	0	1.4	3.8	5.5	7.2
Z8	0.1	1.0	1.7	2.2	2.5
Others	4.0	7.5	8.3	7.0	5.8
	100.0	100.0	100.0	100.0	100.0

*Calculated value is less than 0.1 percent.

Note: Columns may not add to totals shown because of rounding. NMOS/CMOS/EPROM versions are included in the market share numbers for each product type.

Source: Dataquest (September 1990)

Table 9
Estimated Market Share by Product Type
for 8-Bit Microcontrollers
1985-1989
(Percentage)

	1985	1986	1987	1988	1989
6500/XX	1.2	1.7	1.4	1.4	1.0
6801/03	7.8	8.8	8.7	8.2	6.8
6804	0.3	0.7	1.5	1.0	1.1
6805/68HC05	14.3	15.7	16.7	19.6	23.0
68HC11	*	0.3	1.3	2.5	3.8
8048/35	12.6	6.3	5.3	3.4	2.2
8049/39	17.7	13.2	14.9	11.4	8.5
8050/40	1.3	1.3	2.0	1.4	0.9
8051/31	10.7	9.9	11.5	11.6	10.8
8052/32	0.2	1.5	2.0	3.2	4.8
84XX	3.8	6.7	4.1	3.2	3.0
F8/387X	2.7	3.2	1.7	0.9	0.8
M50XXX	9.2	14.0	0	0	0
M509XX	0	0	4.4	6.6	5.2
M507XX	0	0	7.9	6.1	4.5
PIC1652/54	0.9	0.8	1.4	1.4	1.2
PIC1655/57	2.0	0.7	0.4	0.2	0
TMS7000	1.0	1.5	3.1	2.8	2.2
uPD78XX	7.0	8.6	8.1	8.5	7.9
MN18XX	0.1	0.2	0.4	1.2	2.6
Z8	1.7	2.1	1.6	1.6	1.7
Others	5.4	2.7	1.8	3.6	8.1
	100.0	100.0	100.0	100.0	100.0

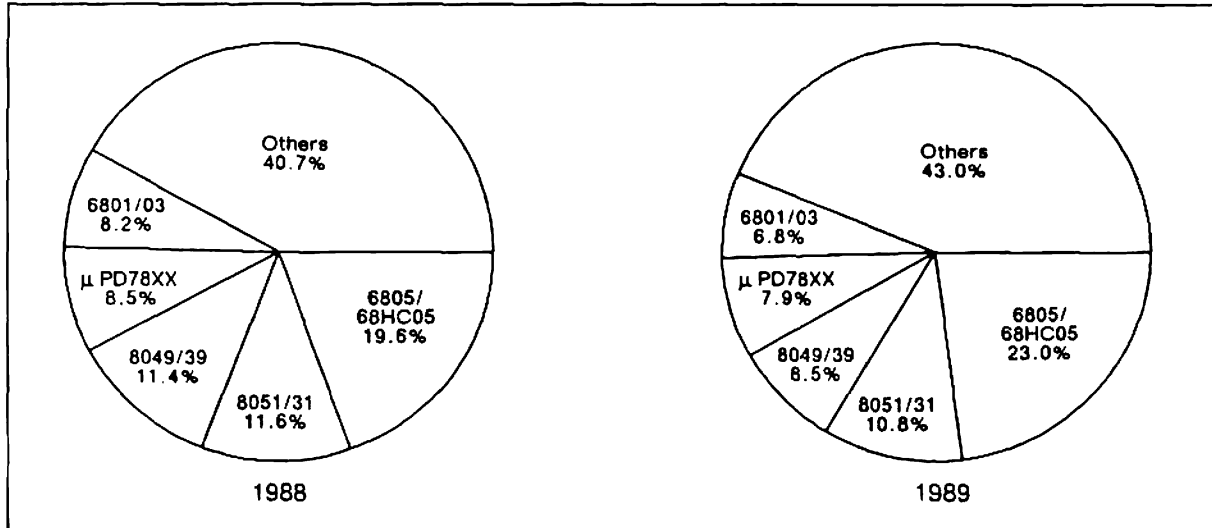
*Calculated value is less than 0.1 percent.

Note: Columns may not add to totals shown because of rounding. NMOS/CMOS/EPROM versions are included in the market share numbers for each product type.

Source: Dataquest (September 1990)

Figure 3

Estimated Market Share by Product Type
for 8-Bit Microcontrollers
1988 and 1989



Source: Dataquest (September 1990)

Table 10

Estimated Market Share by Instruction Set
for 8-Bit Microcontrollers
1975-1979
(Percentage)

		1975	1976	1977	1978	1979
Group 1	6500/XX	0	0	0	0	0.1
Group 2	6801/03	0	0	0	0	0.1
Group 3	6805	0	0	0	0	*
Group 4	8048/35, 8049/39, 802X	0	0	11.9	24.1	32.9
Group 5	387X, 38P7X, F8	100.0	100.0	88.1	55.6	31.5
Group 6	PIC1650	0	0	0	20.3	35.4
Total 8-Bit MCU		100.0	100.0	100.0	100.0	100.0

*Calculated value is less than 0.1 percent.

Note: Columns may not add to totals shown because of rounding. NMOS/CMOS/EPROM versions are included in market share estimates for each instruction set group.

Source: Dataquest (September 1990)

Table 11

**Estimated Market Share by Instruction Set
for 8-Bit Microcontrollers
1980-1984
(Percentage)**

		1980	1981	1982	1983	1984
Group 1	6500/1, 6511, 5074X	0.5	1.0	0.6	1.3	1.2
Group 2	6801/03, 6301	0.9	5.4	7.8	10.5	7.8
Group 3	6805, 68HC05, 6305, 146805	2.1	8.0	12.4	12.8	11.9
Group 4	8048/35, 8049/39, 8050/40, 84XX, 8041, 802X	45.4	49.9	53.6	47.7	46.4
Group 5	8051/31, 8052/32, 8053, 80515/35, 80C451, 80C154	0	0.1	1.0	6.2	13.7
Group 6	387X, 38P7X, F8	25.1	21.2	10.7	5.7	2.7
Group 7	PIC165X	25.8	11.8	7.8	5.0	3.9
Group 8	TMS7000, PIC70XX	0	0.1	0.5	0.8	0.7
Group 9	uPD78XX	0	1.4	3.8	5.5	7.2
Group 10	Z8	0.1	1.0	1.7	2.2	2.5
	Others	0.1	0.2	0.1	2.4	1.9
	Total 8-Bit MCUs	100.0	100.0	100.0	100.0	100.0

Note: Columns may not add to totals shown because of rounding. NMOS/CMOS/EPROM versions are included in market share estimates for each instruction set group.

Source: Dataquest (September 1990)

Table 12
Estimated Market Share by Instruction Set
for 8-Bit Microcontrollers
1985-1989
(Percentage)

		1985	1986	1987	1988	1989
Group 1	6500/1, 6511, 5074X	10.4	15.7	9.3	7.5	5.5
Group 2	6801/03, 6301	7.8	8.8	8.7	8.2	6.8
Group 3	6804	0.3	0.7	1.5	1.0	1.1
Group 4	6805, 68HC05, 6305, 146805	14.3	15.7	16.7	19.6	23.0
Group 5	68HC11	*	0.3	1.3	2.5	3.8
Group 6	8048/35, 8049/39, 8050/40, 84XX, 8041, 802X	39.4	29.5	27.0	20.0	15.0
Group 7	8051/31, 8052/32, 8053, 80515/35, 80C451, 80C154	10.9	11.5	14.2	16.0	18.1
Group 8	387X, 38P7X, F8	2.7	3.2	1.7	0.9	0.8
Group 9	PIC165X	3.1	1.6	1.7	1.6	1.2
Group 10	TMS7000, PIC70XX	1.0	1.5	3.1	2.8	2.2
Group 11	uPD78XX	7.0	8.6	8.1	8.5	7.9
Group 12	Z8	1.7	2.1	1.6	1.6	1.7
	Others	1.4	0.8	5.1	9.8	13.1
	Total 8-Bit MCUs	100.0	100.0	100.0	100.0	100.0

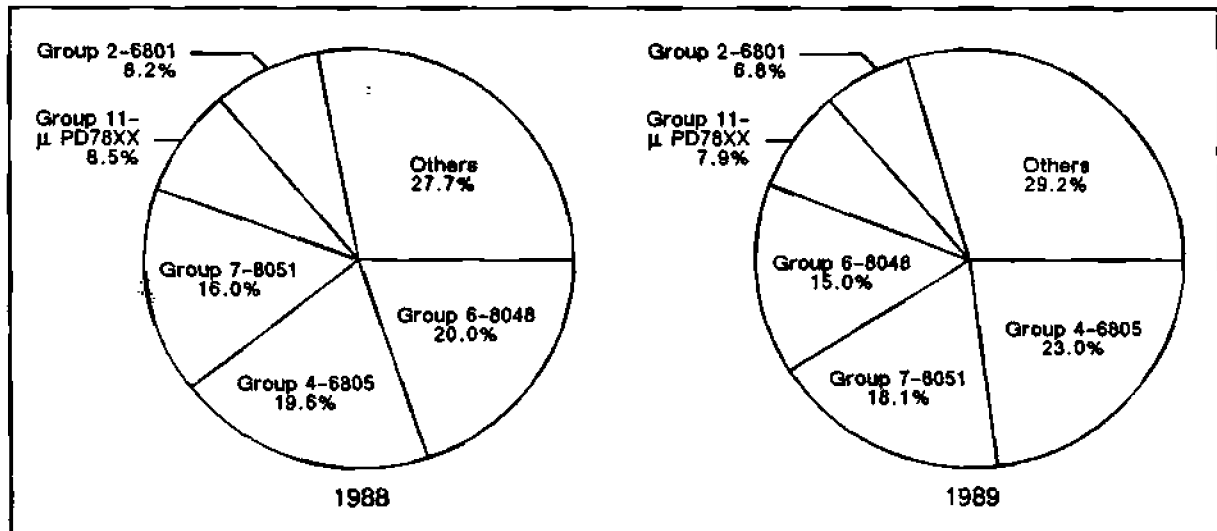
*Calculated value is less than 0.1 percent.

Note: Columns may not add to totals shown because of rounding. NMOS/CMOS/EPROM versions are included in market share estimates for each instruction set group.

Source: Dataquest (September 1990)

Figure 4

Estimated Market Share by Instruction Set
for 8-Bit Microcontrollers
1988 and 1989



Source: Dataquest (September 1990)

Table 13

Estimated Market Share by Process Technology
for 8-Bit Microcontrollers
1975-1979

	1975	1976	1977	1978	1979
NMOS					
Shipments	32	251	885	2,218	11,592
Percent	100.0	100.0	100.0	100.0	100.0

Source: Dataquest (September 1990)

Table 14

**Estimated Market Share by Process Technology
for 8-Bit Microcontrollers
1980-1984
(Thousands of Units)**

	1980	1981	1982	1983	1984
NMOS					
Shipments	21,740	34,836	52,369	82,779	147,135
Percent	100.0	99.7	96.8	91.4	90.0
CMOS					
Shipments	0	95	1,745	7,836	16,375
Percent	0	0.3	3.2	8.6	10.0
Total Shipments	21,740	34,931	54,114	90,615	163,510

Source: Dataquest (September 1990)

Table 15

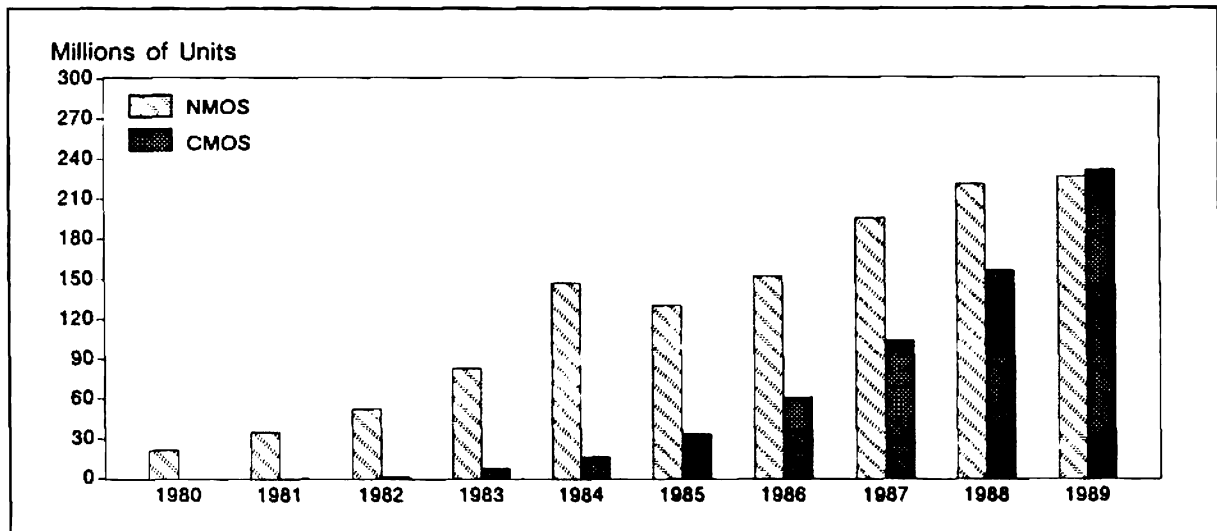
**Estimated Market Share by Process Technology
for 8-Bit Microcontrollers
1985-1989
(Thousands of Units)**

	1985	1986	1987	1988	1989
NMOS					
Shipments	130,011	151,935	195,717	221,138	226,828
Percent	79.5	71.4	65.4	58.6	49.5
CMOS					
Shipments	33,588	60,996	103,753	156,338	231,871
Percent	20.5	28.6	34.6	41.4	50.5
Total Shipments	163,599	212,931	299,470	377,476	458,699

Source: Dataquest (September 1990)

Figure 5

**Estimated Market Share by Process Technology
for 8-Bit Microcontrollers
1980-1989**



Source: Dataquest (September 1990)

Table 16

**Estimated Market Share by Process Technology by Region
for 8-Bit Microcontrollers
1975-1979
(Percentage)**

	1975	1976	1977	1978	1979
NMOS					
United States	100.0	100.0	100.0	99.3	91.1
Japan	0	0	0	0.7	8.5
Western Europe	0	0	0	0	0.4
Total NMOS	100.0	100.0	100.0	100.0	100.0

Source: Dataquest (September 1990)

Table 17

**Estimated Market Share by Process Technology by Region
for 8-Bit Microcontrollers
1980-1984
(Percentage)**

	1980	1981	1982	1983	1984
NMOS					
United States	73.3	68.2	61.8	59.4	53.7
Japan	15.5	20.1	26.0	28.6	33.3
Western Europe	11.2	11.7	12.2	12.1	13.0
Total NMOS	100.0	100.0	100.0	100.0	100.0
CMOS					
United States	0	100.0	39.3	39.3	33.7
Japan	0	0	60.2	60.7	66.1
Western Europe	0	0	0	0	0.1
Total CMOS	0	100.0	100.0	100.0	100.0

Source: Dataquest (September 1990)

Table 18

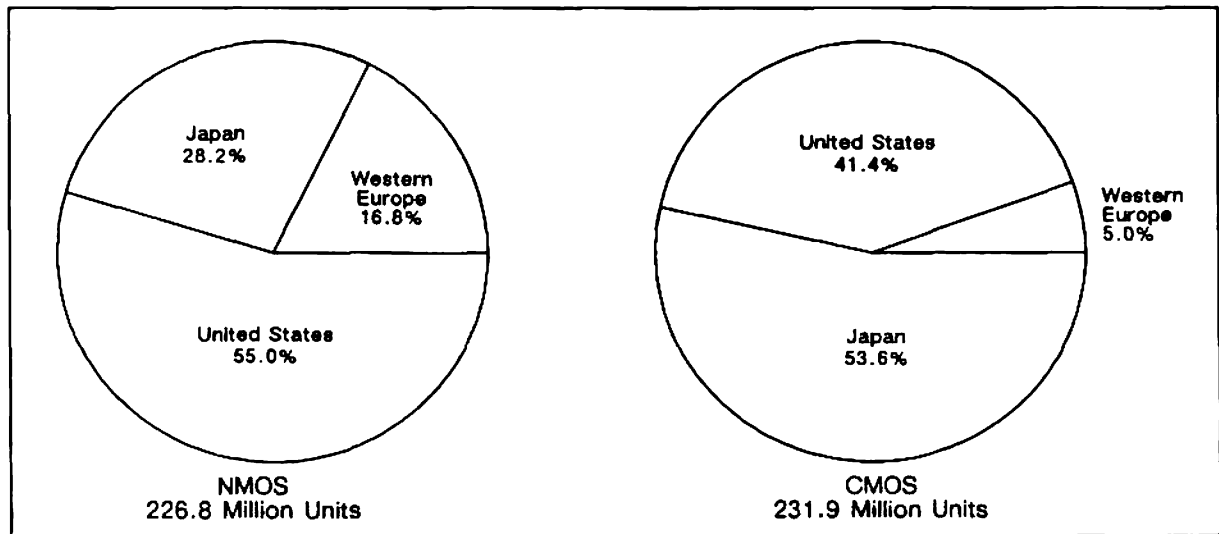
**Estimated Market Share by Process Technology by Region
for 8-Bit Microcontrollers
1985-1989
(Percentage)**

	1985	1986	1987	1988	1989
NMOS					
United States	49.5	46.0	50.6	56.2	55.0
Japan	32.8	32.1	31.5	28.9	28.2
Western Europe	17.6	22.0	17.9	14.9	16.8
Total NMOS	100.0	100.0	100.0	100.0	100.0
CMOS					
United States	16.4	13.2	18.1	26.5	41.4
Japan	83.1	85.6	78.3	68.7	53.6
Western Europe	0.5	1.2	3.6	4.7	5.0
Total CMOS	100.0	100.0	100.0	100.0	100.0

Source: Dataquest (September 1990)

Figure 6

Estimated Market Share by Process Technology by Region
for 8-Bit Microcontrollers
1989



Source: Dataquest (September 1990)

Chapter 4

16-Bit Microcontrollers

The tables and figures in this section are organized as follows:

Table 1	Estimated Market Share by Manufacturer for 16-Bit Microcontrollers, 1985-1989
Figure 1	Estimated Market Share by Manufacturer for 16-Bit Microcontrollers, 1988 and 1989
Table 2	Estimated Market Share by Region for 16-Bit Microcontrollers, 1985-1989
Figure 2	Estimated Market Share by Region for 16-Bit Microcontrollers, 1985-1989
Table 3	Estimated Market Share by Product Type for 16-Bit Microcontrollers, 1985-1989
Figure 3	Estimated Market Share by Product Type for 16-Bit Microcontrollers, 1988 and 1989
Table 4	Estimated Market Share by Process Technology for 16-Bit Microcontrollers, 1985-1989
Figure 4	Estimated Market Share by Process Technology for 16-Bit Microcontrollers, 1985-1989
Table 5	Estimated Market Share by Process Technology by Region for 16-Bit Microcontrollers, 1985-1989
Figure 5	Estimated Market Share by Process Technology by Region for 16-Bit Microcontrollers, 1989

Table 1
Estimated Market Share by Manufacturer
for 16-Bit Microcontrollers
1985-1989
(Percentage)

	1985	1986	1987	1988	1989
Hitachi	0	0	0	0	0.5
Intel	62.5	67.4	16.6	33.1	45.0
Mitsubishi	0	0	0	0	2.4
NEC	0	0	0.1	0.2	0.2
National	0	0	0.8	4.6	8.4
SGS-Thomson ¹	5.2	32.3	3.3	1.2	0.8
Texas Instruments	32.3	0.3	0	0	0
Various ²	0	0	79.2	60.9	42.7
Total 16-Bit MCUs	100.0	100.0	100.0	100.0	100.0

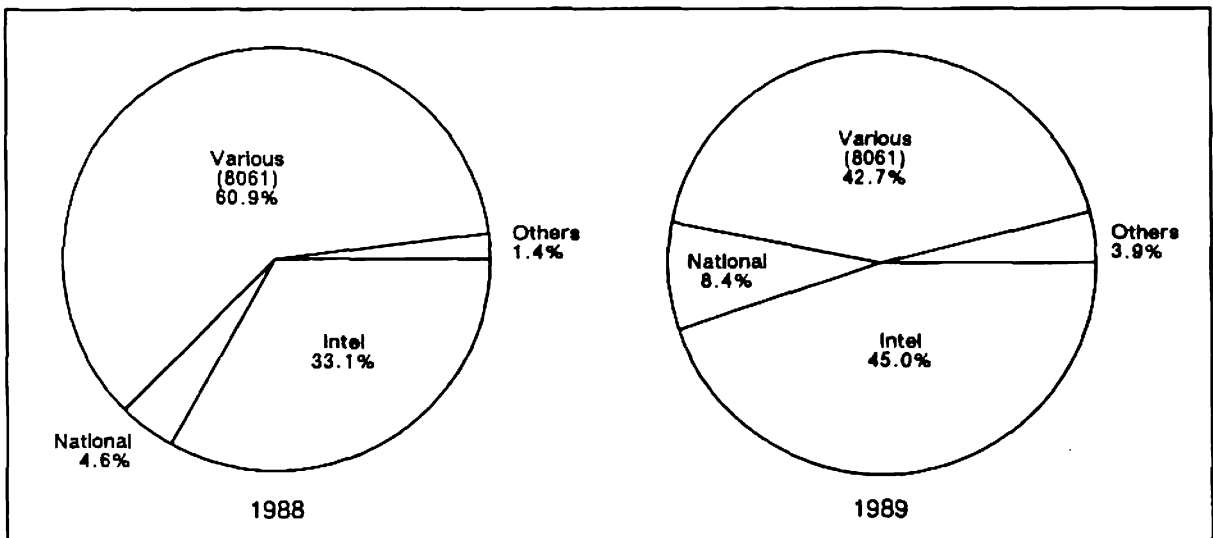
¹Mostek was acquired by Thomson Components in 1985. Thomson Components subsequently merged with SGS in 1987.

²The 8061 is a custom-designed, 16-bit microcontroller for Ford Motor Company. It is supplied by several semiconductor companies, including Intel. Estimated production of the 8061 based on production of Ford automobiles and trucks. (No attempt to estimate production prior to 1987 has been made.)

Note: Columns may not add to totals shown because of rounding.

Source: Dataquest (September 1990)

Figure 1
Estimated Market Share by Manufacturer
for 16-Bit Microcontrollers
1988 and 1989



Source: Dataquest (September 1990)

Table 2

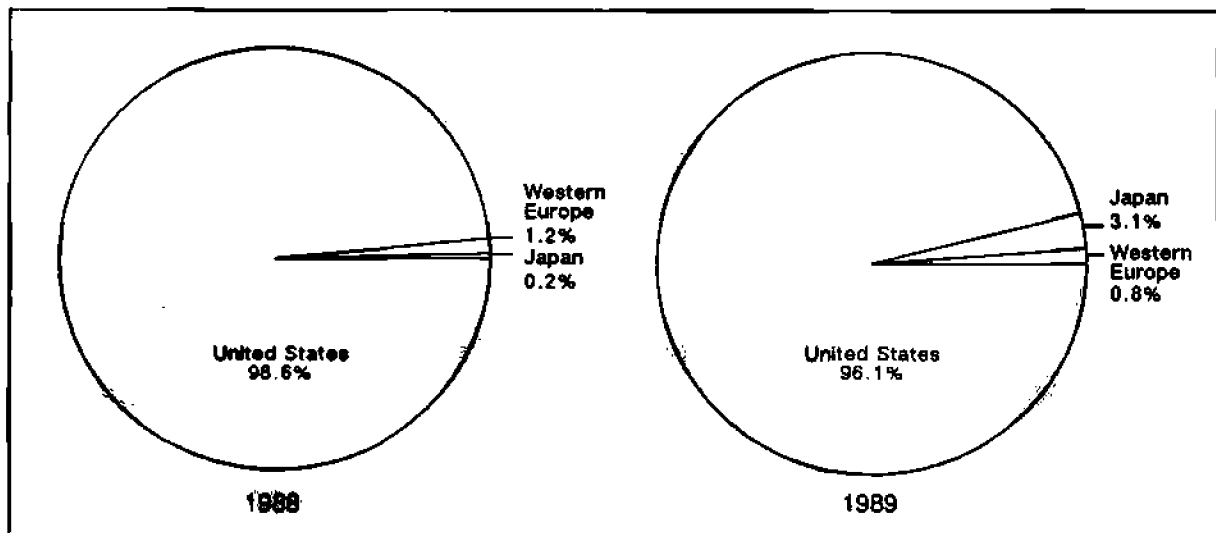
**Estimated Market Share by Region
for 16-Bit Microcontrollers
1985-1989**

	1985	1986	1987	1988	1989
United States					
Shipments	220	270	3,199	5,388	7,148
Percent	94.8	67.7	96.6	98.6	96.1
Japan					
Shipments	0	0	2	9	233
Percent	0	0	0.1	0.2	3.1
Western Europe					
Shipments	12	129	110	64	57
Percent	5.2	32.3	3.3	1.2	0.8
Total Shipments	232	399	3,311	5,461	7,438

Source: Dataquest (September 1990)

Figure 2

**Estimated Market Share by Region
for 16-Bit Microcontrollers
1985-1989**



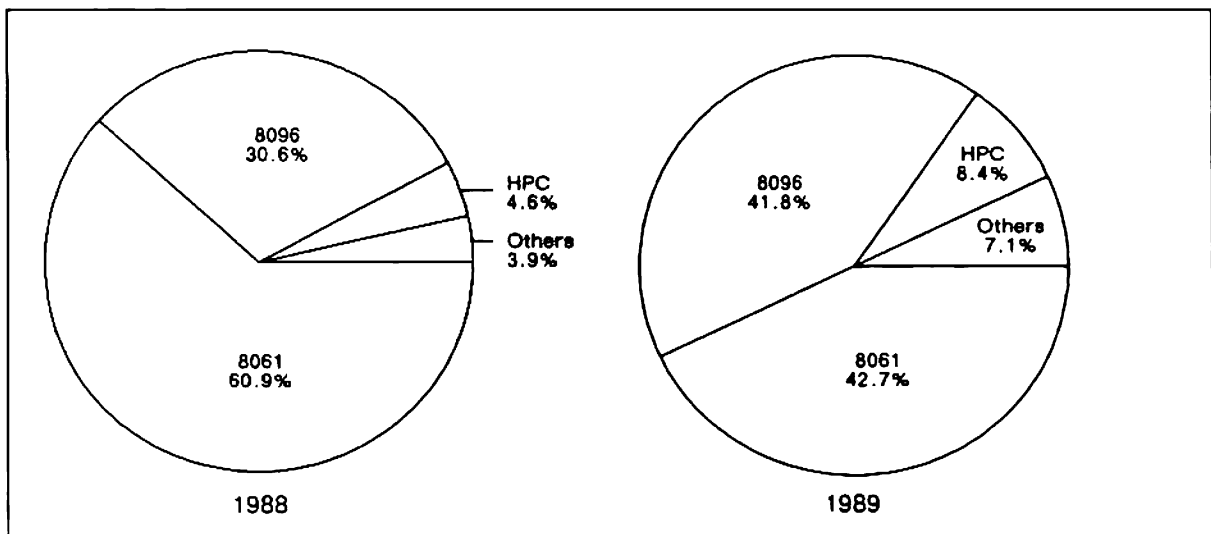
Source: Dataquest (September 1990)

Table 3
Estimated Market Share by Product Type
for 16-Bit Microcontrollers
1985-1989
(Percentage)

	1985	1986	1987	1988	1989
8096	62.5	67.4	16.6	30.6	41.8
8061	0	0	79.3	60.9	42.7
HPC	0	0	0.8	4.6	8.4
68200	5.2	32.3	3.3	1.2	0.8
Others	32.3	0.3	0.1	2.7	6.4
Total 16-Bit MCUs	100.0	100.0	100.0	100.0	100.0

Note: Columns may not add to totals shown because of rounding.
Source: Dataquest (September 1990)

Figure 3
Estimated Market Share by Product Type
for 16-Bit Microcontrollers
1988 and 1989



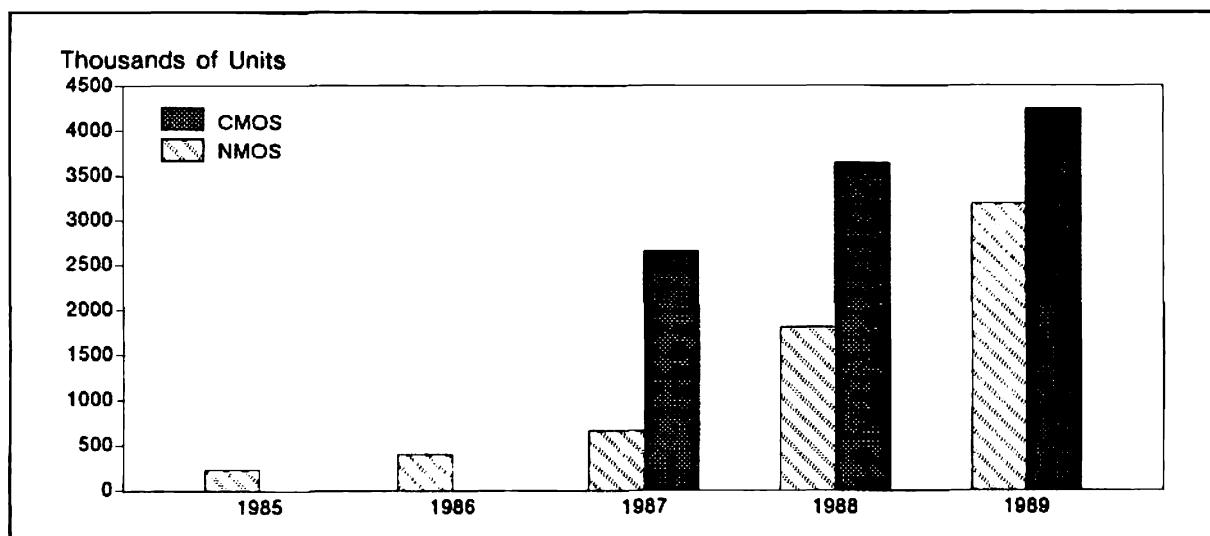
Source: Dataquest (September 1990)

Table 4
Estimated Market Share by Process Technology
for 16-Bit Microcontrollers
1985-1989
(Thousands of Units)

	1985	1986	1987	1988	1989
NMOS					
Shipments	232	399	658	1,814	3,192
Percent	100.0	100.0	19.9	33.2	42.9
CMOS					
Shipments	0	0	2,653	3,647	4,246
Percent	0	0	80.1	66.8	57.1
Total Shipments	232	399	3,311	5,461	7,438

Source: Dataquest (September 1990)

Figure 4
Estimated Market Share by Process Technology
for 16-Bit Microcontrollers
1985-1989



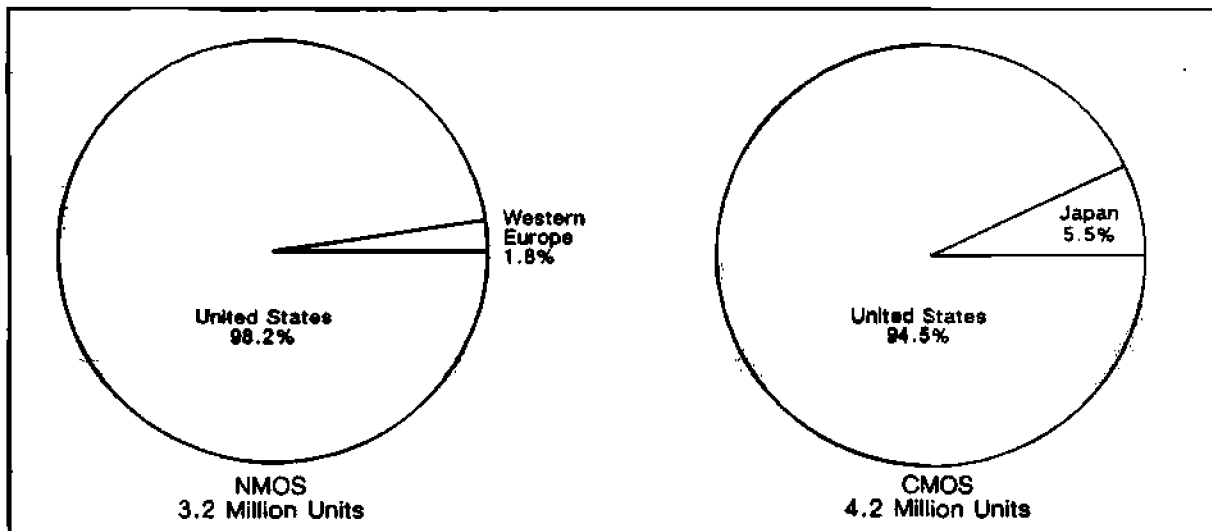
Source: Dataquest (September 1990)

Table 5
Estimated Market Share by Process Technology by Region
for 16-Bit Microcontrollers
1985-1989
(Percentage)

	1985	1986	1987	1988	1989
NMOS					
United States	94.8	67.7	83.3	96.5	98.2
Japan	0	0	0	0	0
Western Europe	5.2	32.3	16.7	3.5	1.8
Total NMOS	100.0	100.0	100.0	100.0	100.0
CMOS					
United States	0	0	99.9	99.8	94.5
Japan	0	0	0.1	0.2	5.5
Western Europe	0	0	0	0	0
Total CMOS	0	0	100.0	100.0	100.0

Source: Dataquest (September 1990)

Figure 5
Estimated Market Share by Process Technology by Region
for 16-Bit Microcontrollers
1989



Source: Dataquest (September 1990)

Dataquest

DB a company of
The Dun & Bradstreet Corporation

Dataquest Research and Sales Offices:

Dataquest Incorporated

1290 Ridder Park Drive
San Jose, California 95131-2398
Phone: (408) 437-8000
Telex: 171973
Fax: (408) 437-0292

Technology Products Group

Phone: (800) 624-3280

Dataquest Incorporated

Invitational Computer Conferences Division

3151 Airway Avenue, C 2
Costa Mesa, California 92626
Phone: (714) 957-0171
Telex: 5101002189 ICCIDQ
Fax: (714) 957-0903

Dataquest Incorporated

Ledgeway Group

430 Bedford Street
Suite 340
Lexington, MA 02173
Phone: (617) 862-8500
Fax: (617) 862-8207

Dataquest Australia

Suite 1, Century Plaza
80 Berry Street
North Sydney, NSW 2060
Australia
Phone: (02) 959-4544
Telex: 25468
Fax: (02) 929-0635

Dataquest Boston

1740 Massachusetts Ave.
Boxborough, MA 01719-2209
Phone: (508) 264-4373
Telex: 171973
Fax: (508) 635-0183

Dataquest GmbH

Kronstadter Strasse 9
8000 Munich 80
West Germany
Phone: 49 89 930 2081 (Temporary)
Fax: 49 89 930 3277

Dataquest Europe Limited

Roussel House, Broadwater Park
Denham, Uxbridge, Middx UB9 5HP
England
Phone: 0895-835050
Telex: 266195
Fax: 0895-835260/1/2

Dataquest Europe SA

Tour Gallieni 2
36, avenue du Général de Gaulle
93175 Bagnole Cedex
France
Phone: (1) 48 97 31 00
Telex: 233 263
Fax: (1) 48 97 34 00

Dataquest Hong Kong

Rm 401, Connaught Comm Bldg
185 Wanchai Rd
Wanchai, Hong Kong
Phone: 8387336
Telex: 80587
Fax: 5722375

Dataquest Israel

59 Mishmar Ha'yarden Street
Tel Aviv, Israel 69865
or
P.O. Box 18198
Tel Aviv, Israel
Phone: 52 913937
Telex: 34118
Fax: 52 32865

Dataquest Japan Limited

Shinkawa Sanko Building
1-3-17 Shinkawa, Chuo-ku
Tokyo 104 Japan
Phone: (03) 5566-0411
Fax: (03) 5566-0425

Dataquest Korea

Daehung Bldg., Room 505
648-23 Yeoksam-dong
Kangnam-gu
Seoul, Korea 135
Phone: (02) 552-2332
Fax: (02) 552-2661

Dataquest Singapore

4012 Ang Mo Kio Industrial Park 1
Ave 10, #03 10 to #03 12
Singapore 2056
Phone: 4597181
Telex: 38257
Fax: 4563129

Dataquest Taiwan

Room 801/8th Floor
Ever Spring Building
147, Sect. 2, Chien Kuo N. Rd
Taiper, Taiwan R.O.C. 104
Phone: (02) 501-7960
Telex: 27459
Fax: (02) 505-4265

Dataquest West Germany

In der Schenithohl 17
6242 Kronberg 2
West Germany
Phone: 06173-61685
Telex: 418089
Fax: 06173-67901