

Appendix

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Appendix 1 Number of Internet hosts in top 10 countries

(Unit: number of hosts)

	Jan. 1995	Jul. 1995	Jan. 1996	Jul. 1996	Jan. 1997	Jul. 1997	Jan. 1998	Jul. 1998	Jan. 1999	
US	Commercial (com)	1,316,966	1,743,390	2,430,954	3,323,647	3,965,417	4,501,039	8,201,511	10,301,570	12,140,747
	Networks (net)	150,299	300,481	758,597	1,232,902	1,548,575	2,164,815	5,283,568	7,054,863	8,856,687
	Educational (ed)	1,133,502	1,411,013	1,793,491	2,114,851	2,654,129	2,942,714	3,944,967	4,464,216	5,022,815
	US Military (mil)	175,961	224,778	258,791	431,939	655,128	542,295	1,099,186	1,359,153	1,510,440
	Organizations (org)	154,578	201,905	265,327	327,148	387,280	434,654	519,862	644,971	744,285
	Government (gov)	209,345	273,855	312,330	361,065	313,204	418,576	497,646	612,725	651,200
	US (us)	37,615	113,226	233,912	432,727	587,175	825,048	1,076,583	1,302,204	1,562,391
	Total	3,178,266	4,268,648	6,053,402	8,224,279	10,110,908	11,829,141	20,623,323	25,739,702	30,488,565
	Japan (jp)	96,632	159,776	269,327	496,427	734,406	955,688	1,168,956	1,352,200	1,687,534
	UK (uk, gb)	241,218	291,286	451,787	579,532	591,663	878,255	987,774	1,190,744	1,423,844
	Germany (de)	207,717	350,707	452,997	548,168	721,847	875,631	994,926	1,154,340	1,316,893
	Canada (ca)	186,722	262,644	372,891	424,356	603,325	690,316	839,141	1,027,571	1,119,172
	Australia (au)	161,166	207,426	309,562	397,460	514,760	707,611	665,403	750,327	792,351
	Netherlands (nl)	89,227	135,462	174,888	214,704	270,521	341,560	381,172	514,660	564,129
	Finland (fi)	71,372	111,861	208,502	277,207	283,526	335,956	450,044	513,527	546,244
	France (fr)	93,041	113,974	137,217	189,786	245,501	292,096	333,306	431,045	488,043
	Sweden (se)	77,594	106,725	149,877	186,312	232,955	284,478	319,065	380,634	431,809
	Others	448,888	633,032	891,774	1,342,468	1,836,948	2,349,593	2,906,501	3,684,401	4,371,110
	World total	4,851,843	6,641,541	9,472,224	12,880,699	16,146,360	19,540,325	29,669,611	36,739,151	43,229,694

Note: All generic top-level domains worldwide, such as "com," "net" and "org," which are mostly used in the U.S., are included in the figures for the "U.S."

Source: Network Wizards (<http://www.nw.com/zone/WWW/top.html>)

Appendix 2 Number of Internet hosts by region

(Unit: number of hosts)

	Jan. 1995	Jul. 1995	Jan. 1996	Jul. 1996	Jan. 1997	Jul. 1997	Jan. 1998	Jul. 1998	Jan. 1999
Africa	27,358	41,672	49,406	85,216	103,306	123,660	128,539	148,450	155,372
Asia-Oceania	344,171	481,215	743,457	1,151,437	1,585,877	2,205,034	2,516,842	2,815,100	3,403,442
Central and South America	15,592	36,001	56,980	106,187	165,708	173,711	241,983	387,033	491,356
Middle East	16,222	22,206	37,377	51,967	59,781	94,460	100,467	141,009	162,864
Europe	1,082,608	1,527,913	2,157,154	2,835,327	3,515,475	4,423,279	5,141,305	6,407,913	7,263,136
North America	3,364,988	4,531,292	6,426,293	8,648,635	10,714,233	12,519,457	21,462,465	26,767,273	31,607,738
International organizations	904	1,242	1,557	1,930	1,980	724	672	853	898
Unknown	0	0	0	0	0	0	77,338	71,520	144,888
Total	4,851,843	6,641,541	9,472,224	12,880,699	16,146,360	19,540,325	29,669,611	36,739,151	43,229,694

Note: All generic top-level domains worldwide, such as "com," "net" and "org," which are mostly used in the United States, are included in the figures for "North America."

Source: Network Wizards (<http://www.nw.com/zone/WWW/top.html>)

Appendix 3 Usage of the Internet at ministries and agencies

(A=available, NA=Not available)

Ministries and agencies of the central government	Website	Press release on the web	Acceptance of public opinions via the Internet	Clearing and search systems*1	URL	Number of homepages
Prime Minister's Office	A	A	A	A	http://www.sorifu.go.jp/	5 (IB: 1, In: 4)
Fair Trade Commission	A	A	NA	A	http://www.jftc.admix.go.jp/	1 (IB: 1)
National Police Agency	A	A	A	NA	http://www.npa.go.jp/	1 (In: 1)
Environmental Dispute Coordination Commission	A	NA	A	NA	http://www.kouchoi.go.jp/	--
Imperial Household Agency	NA	NA	NA	NA	--	--
Management & Coordination Agency	A	A	A	A	http://www.somucho.go.jp/	1 (IB: 1)
Hokkaido Development Agency	A	A	A	NA	http://www.hda.go.jp/	1 (RB: 1)
Defense Agency	A	A	A	NA	http://www.jda.go.jp/	6 (In: 6)
Economic Planning Agency	A	A	A	A	http://www.epa.go.jp/	1 (IB: 1)
Science & Technology Agency	A	A	A	A	http://www.sta.go.jp/	7 (IB: 1, In: 6)
Environment Agency	A	A	A	A	http://www.eic.or.jp/	9 (IB: 6, In: 3)
Okinawa Development Agency	A	NA	A	NA	http://www.oda.go.jp/	--
National Land Agency	A	A	A	A	http://www.nla.go.jp/	1 (IB: 1)
Financial Supervisory Agency	A	A	A	NA	http://www.fsa.go.jp/	--
Ministry of Justice	A	NA	A	A	http://www.moj.go.jp/	18 (IB: 17, In: 1)
Ministry of Foreign Affairs	A	A	A	A	http://www.mofa.go.jp/	--
Ministry of Finance	A	A	A	A	http://www.mof.go.jp/	28 (IB: 1, RB: 25, In: 2)
Ministry of Education	A	A	A	A	http://www.monbu.go.jp/	227 (IB: 1, In: 226)
Ministry of Health and Welfare	A	A	A	A	http://www.mhw.go.jp/	38 (In: 38)
Min. of Agriculture, Forestry & Fisheries	A	A	A	A	http://www.maff.go.jp/	11 (IB: 3, RB: 7, In: 1)
Min. of International Trade & Industry	A	A	A	A	http://www.miti.go.jp/	30 (RB: 9, In: 21)
Ministry of Transport	A	A	A	A	http://www.motnet.go.jp/	26 (IB: 2, RB: 16, In: 8)
Ministry of Posts and Telecommunications	A	A	A	A	http://www.mpt.go.jp/	31 (IB: 7, RB: 22, In: 2)
Ministry of Labor	A	A	A	A	http://www.mol.go.jp/	9 (IB: 1, RB: 6, In: 2)
Ministry of Construction	A	A	A	A	http://www.moc.go.jp/	12 (IB: 1, RB: 8, In: 3)
Ministry of Home Affairs	A	A	A	A	http://www.mha.go.jp/	2 (IB: 1, In: 1)

Notes: 1. Includes link to the Management and Coordination Agency's clearing system.

2. IB: internal bureaus or departments, RB: regional bureaus, In: attached institutions

Source: "Survey on the current status of administrative informatization basic plan in around fiscal 1998," the Management and Coordination Agency

Appendix 4 Information distributed via the Internet by local governments and number of times the sites have been accessed

Information by category	Local governments with website		Local governments with popular website		C(=B/A)
	Number (A)	Ratio N=1,241	Number (B)	Ratio N=1,241	
1 Tourism	1,173	94.5%	651	52.5%	55.5%
2 Local events	1,108	89.3%	482	38.8%	43.5%
3 Outline of the community/message from its chief	881	71.0%	123	9.9%	14.0%
4 Guide to public facilities	563	45.4%	122	9.8%	21.7%
5 Outline of local industry	481	38.8%	72	5.8%	15.0%
6 Statistics	364	29.3%	57	4.6%	15.7%
7 Education	312	25.1%	47	3.8%	15.1%
8 Public health, medicine, social welfare	309	24.9%	49	3.9%	15.9%
9 Administrative plan, report	301	24.3%	36	2.9%	12.0%
10 Disaster prevention	184	14.8%	14	1.1%	7.6%
11 Environment	181	14.6%	24	1.9%	13.3%
12 Relocation information	98	7.9%	34	2.7%	34.7%
13 Local government assembly	82	6.6%	6	0.5%	7.3%
14 Job opportunities	53	4.3%	6	0.5%	11.3%
15 Press releases/conferences	47	3.8%	19	1.5%	40.4%
16 "Information disclosure," e.g., financial report	45	3.6%	3	0.2%	6.7%
17 Others	131	10.6%	91	7.3%	69.5%
Do not know	-	-	448	36.1%	-
No answer	10	0.8%	29	2.3%	-

Source: "Survey of Local Governments and Public Bodies," MPT

Appendix 5 Types of domain names

Domain name	Expression	Types of organizations and qualifications for registration
Attribution type	AC	***.ac.jp (a) Schools under the School Education Law or other laws (excluding organizations which are qualified for (a) for the ED domain name mentioned below), shared-use organizations for universities, job training schools (b) Educational foundations, job training corporations
	CO	***.co.jp Joint stock companies, limited private companies, unlimited partnerships, limited partnerships, mutual corporations, special companies and other corporations, credit associations, credit unions and foreign corporations <i>Note: Only foreign corporations which have registered as a foreign corporation in Japan are qualified.</i>
	GO	***.go.jp Japanese governmental organizations, research institutes under the jurisdiction of any ministry or agency, special corporations (except for special companies) <i>Note: Special corporations can choose either a GO domain name or an OR domain name.</i>
	OR	***.or.jp (a) Incorporated foundations, corporate juridical persons, medical corporations, auditory corporations, religious juridical persons, special corporations (except for special companies), agricultural cooperative associations, livelihood cooperative associations, other corporations established under the Japanese law but are not qualified as CO, AC, ED, GO. (b) Official international organizations such as the United Nations, diplomatic and consular offices in Japan, representative offices and other organizations of foreign governmental organizations in Japan, and representative offices and other organizations of foreign local governments such as a state government in Japan. <i>Note: Special corporations can choose either a GO domain name or an OR domain name.</i>
	AD	***.ad.jp (a) Network operated by members of JPNIC (b) Organizations which JPNIC recognized as necessary for operating the Internet <i>Note: Networks operated by JPNIC members are recognized as an organization under Article 9 of the JPNIC's rules regarding registration of domain names.</i>
	NE	***.ne.jp Either commercial-based or non-profit network services which are provided by network service providers in Japan to many and unspecified persons <i>Notes:</i> 1. The ISP shall use the registered domain name as part of ID of users on the Internet. 2. The ISP shall be a person living in Japan or a corporation registered in Japan. 3. Content of network services should be clearly demonstrated for their users in a written form. 4. When one organization is providing more than one network service, each network service is recognized as an organization under the Article 9 of the rule mentioned above.
	GR	***.gr.jp A group organized by persons living in Japan or corporations registered in Japan <i>Note: The representative or deputy representative of the organization should be a person living in Japan or a corporation registered in Japan.</i>
Regional type	ED	***.ed.jp (a) Nursery schools, kindergarten, elementary schools, junior-high schools, high schools, schools for people with visual disabilities, schools for people with hearing disabilities, schools for people with disabilities, technical colleges and other variety of schools which are targeting mainly people aged 17 or under. (b) Organizations whose mission is similar to ones categorized in (a) which are targeting mainly students aged 17 or under. (c) Educational foundations which have more than one organization which are categorized as (a) or (b), universities or schools of universities which have organizations categorized as (a) or (b), and public educational centers or public educational network which organize organizations categorized as (a) or (b).
	Ordinary regional type	***.tokyo.jp (a) Organizations qualified either AC, CO, ED, GO, OR, NE or GR (b) Hospitals (c) Individuals living in Japan
	Local government type	***.metro.tokyo.jp Regional public organizations, subordinate organizations under such regional public organizations

Source: "Rules regarding domain name registration: attached paper 'types of domain names'" by JPNIC (<http://www.nic.ad.jp/jnic/domain/rule.html>)

Appendix 6 Scope and structure of info-communications industry

Appendix

Info-communications-related business	Info-communications services	Communications and broadcasting	Postal service	Postal service Postal entrusted business (postal agencies and others)	
			Domestic telecommunications	Domestic public telecommunications network (telephone)	Domestic public telecommunications network (telephone)
				Domestic public telecommunications network (others)	Domestic public telecommunications network (others)
				Domestic leased circuit	Domestic leased circuit
		International telecommunications	Mobile communications	Mobile communications	
			Other domestic telecommunications network	Other domestic telecommunications network	
		Broadcasting	International telecommunications network	International telecommunications network	
			International leased circuit	International leased circuit	
			Other international telecommunications	Other international telecommunications	
		Information software	Public broadcasting	Public broadcasting	
Commercial terrestrial TV broadcasting	Commercial terrestrial TV broadcasting				
Commercial terrestrial radio broadcasting	Commercial terrestrial radio broadcasting				
Information-related services	Commercial satellite broadcasting	Commercial satellite broadcasting			
	Cable TV broadcasting	Cable TV broadcasting			
	Cable radio broadcasting	Cable radio broadcasting			
Info-communications equipment manufacturing	Software (for computer)	Software (for computer)			
	Packaged media manufacturing	Packaged media manufacturing			
	Film, video creation	Film, video creation			
Info-communications supporting facilities and equipment	Newspaper	Newspaper			
	Printing, platemaking, bookbinding, printing materials processing	Printing, platemaking, bookbinding, printing materials processing			
	Publishing	Publishing			
Info-communications equipment rental	Information services (information processing and others)	Information services (information processing and others)			
	News distribution	News distribution			
	Advertising	Advertising			
Telecommunications facilities construction	Movie theater, theaters and others	Movie theater, theaters and others			
	Office machinery	Office machinery			
	Audio equipment	Audio equipment			
R&D	Radio, TV sets, video devices	Radio, TV sets, video devices			
	Other electronic audio equipment parts and attached devices	Other electronic audio equipment parts and attached devices			
	Electronic calculators and attached devices	Electronic calculators and attached devices			
Non-info-communications-related business	Wire telecommunications equipment	Wire telecommunications equipment			
	Wireless telecommunications equipment	Wireless telecommunications equipment			
	Other electronic/communications equipment parts	Other electronic/communications equipment parts			
Non-info-communications-related business	Electromagnetic tapes, electromagnetic disks	Electromagnetic tapes, electromagnetic disks			
	Computers, and related devices rental business	Computers, and related devices rental business			
	Office machinery rental business (except for computers)	Office machinery rental business (except for computers)			
Non-info-communications-related business	Communications equipment and devices rental business	Communications equipment and devices rental business			
	Communications cable	Communications cable			
	Non-info-communications-related business	Non-info-communications-related business			

Appendix 7 Financial status of Type I telecommunications business

(Unit: 100 million yen, %)

NTT

FY	Operating profit	Operating expense	Recurring profit or loss
1995	62,347	57,936	3,289
1996	63,712 (2.2)	58,929 (1.7)	3,659 (11.2)
1997	63,223 (-0.8)	59,137 (0.4)	3,566 (-2.5)

New regional telecommunications carriers

FY	Operating profit	Operating expense	Recurring profit or loss
1995	1,215	992	108
1996	1,486 (22.3)	1,263 (27.3)	99 (-8.3)
1997	1,877 (26.3)	1,712 (35.6)	-19 (-¥11.8 bil.)

NTT DoCoMo and others

FY	Operating profit	Operating expense	Recurring profit or loss
1995	12,727	11,655	738
1996	20,339 (59.8)	18,601 (59.6)	1,300 (76.2)
1997	27,552 (35.5)	23,918 (28.6)	3,047 (134.4)

PHS

FY	Operating profit	Operating expense	Recurring profit or loss
1995	1,383	2,527	-1,149
1996	4,585 (231.5)	6,944 (174.8)	-2,476 (- ¥132.7 bil.)
1997	6,665 (45.4)	8,581 (23.6)	-2,142 (- ¥33.4 bil.)

KDD

FY	Operating profit	Operating expense	Recurring profit or loss
1995	2,483	2,246	312
1996	3,224 (29.8)	3,106 (38.3)	208 (-33.3)
1997	3,164 (-1.9)	3,053 (-1.7)	167 (-19.7)

New long-distance telecommunications carriers

FY	Operating profit	Operating expense	Recurring profit or loss
1995	9,098	8,054	938
1996	10,456 (14.9)	9,243 (14.8)	1,130 (20.5)
1997	10,363 (-0.9)	9,630 (4.2)	667 (-41.0)

New satellite communications carriers

FY	Operating profit	Operating expense	Recurring profit or loss
1995	460	414	6
1996	384 (-16.5)	353 (-14.7)	10 (66.7)
1997	442 (15.1)	356 (0.8)	42 (320.0)

New cellular/car phone carriers

FY	Operating profit	Operating expense	Recurring profit or loss
1995	8,379	8,824	-759
1996	14,375 (71.6)	14,435 (63.6)	-413 (- ¥34.6 bil.)
1997	17,447 (21.4)	17,113 (18.6)	-81 (- ¥33.2 bil.)

New paging carriers

FY	Operating profit	Operating expense	Recurring profit or loss
1995	1,248	1,093	139
1996	1,268 (1.6)	1,133 (3.7)	115 (-17.3)
1997	1,068 (-15.8)	983 (-13.2)	70 (-39.1)

New international telecommunications carriers

FY	Operating profit	Operating expense	Recurring profit or loss
1995	1,006	836	110
1996	1,480 (47.1)	1,402 (67.7)	68 (-38.2)
1997	834 (-43.6)	731 (-47.9)	63 (-7.4)

- Notes:
1. Figures below 100 million yen are omitted.
 2. Figures in parentheses indicate an increase or decrease from the previous fiscal year.
 3. Total figures do not necessarily equal their added parts, due to rounding-up.
 4. Figures for new long-distance telecommunications carriers indicate the total figures of the three long-distance carriers.
 5. Figures for new regional telecommunications carriers indicate the total numbers for 13 carriers in fiscal 1995, 15 carriers in fiscal 1996 and 28 carriers in fiscal 1997.
 6. Figures for new satellite communications carriers indicate the total numbers for four carriers in fiscal 1995, four carriers in fiscal 1996 and four carriers in fiscal 1997.
 7. Figures for new cellular/car phone carriers indicate the total numbers for 16 carriers in fiscal 1995, 21 carriers in fiscal 1996 and 21 carriers in fiscal 1997.
 8. Figures for PHS carriers indicate the total numbers for 26 carriers in fiscal 1995, 28 carriers in fiscal 1996 and 28 carriers in fiscal 1997.
 9. Figures for new paging carriers indicate total numbers for 31 carriers in fiscal 1995, 31 carriers in fiscal 1996 and 31 carriers in fiscal 1997.
 10. Figures for new international telecommunications carriers are for one carrier.
 11. Recurring losses for four airport radio telephone carriers and teleterminal carriers in fiscal 1997 were a total of 5 billion yen.

Sources: MPT, NTT and KDD

Appendix 8 Financial results of commercial broadcasters (Unit: one million yen, %)

(1) Terrestrial broadcasters

[Broadcasters operating both TV and radio broadcasting]

FY	Operating profit	Operating expense	Recurring profit or loss
1994	(36) 647,751	(36) 613,443	(36) 35,927
1995	(36) 688,789	(36) 640,732	(36) 48,881
1996	(36) 726,847	(36) 667,869	(36) 58,034
1997	(Total: 36) 740,895	(Total: 36) 684,942	(Total: 36) 56,648
	(VHF: 34) 730,828	(VHF: 34) 675,376	(VHF: 34) 56,103
	(UHF: 2) 10,067	(UHF: 2) 9,566	(UHF: 2) 545

[Broadcasters operating only TV]

FY	Operating profit	Operating expense	Recurring profit or loss
1994	(83) 1,319,958	(83) 1,234,004	(83) 84,396
1995	(87) 1,411,450	(87) 1,292,010	(87) 114,805
1996	(88) 1,551,985	(88) 1,392,820	(88) 153,816
1997	(Total: 90) 1,615,222	(Total: 90) 1,453,400	(Total: 90) 156,529
	(VHF: 14) 1,141,048	(VHF: 14) 1,026,395	(VHF: 14) 111,478
	(UHF: 76) 474,174	(UHF: 76) 427,005	(UHF: 76) 45,051

[Broadcasters operating only teletext broadcasting]

FY	Operating profit	Operating expense	Recurring profit or loss
1994	(10) 3,266	(10) 3,074	(10) 204
1995	(9) 3,431	(9) 3,252	(9) 236
1996	(9) 3,595	(9) 3,332	(9) 299
1997	(9) 3,605	(9) 3,375	(9) 263

[Broadcasters operating only radio broadcasting]

FY	Operating profit	Operating expense	Recurring profit or loss
1994	(56) 170,083	(56) 163,946	(56) 8,205
1995	(58) 177,015	(58) 167,602	(58) 9,891
1996	(60) 185,926	(60) 173,472	(60) 12,445
1997	(Total: 61) 186,534	(Total: 61) 175,485	(Total: 61) 11,848
	(AM: 11) 85,435	(AM: 11) 83,593	(AM: 11) 2,323
	(Shortwave: 1) 4,679	(Shortwave: 1) 4,526	(Shortwave: 1) 192
	(FM: 49) 96,420	(FM: 49) 87,366	(FM: 49) 9,333

[Total]

FY	Operating profit	Operating expense	Recurring profit or loss
1994	(186) 2,141,058	(186) 2,014,467	(186) 128,732
1995	(190) 2,280,685	(190) 2,103,596	(190) 173,813
1996	(193) 2,468,353 [8.2]	(193) 2,237,493 [6.4]	(193) 224,594 [29.2]
1997	(196) 2,546,256 [3.2]	(196) 2,317,202 [3.6]	(196) 225,288 [0.3]

Note: Figures in parentheses indicate the number of broadcasters.

(2) Satellite broadcasters**[BS]**

(Unit: one million yen, %)

FY	Operating profit	Operating expense	Recurring profit or loss
1994	(2) 45,432	(2) 40,222	(2) -1,820
1995	(2) 55,983	(2) 47,917	(2) 6,602
1996	(2) 61,058	(2) 50,398	(2) 9,901
1997	(2) 62,273	(2) 53,951	(2) 7,750

[CS]

FY	Operating profit	Operating expense	Recurring profit or loss
1994	(15) 1,571	(15) 5,292	(15) -4,389
1995	(15) 3,338	(15) 6,576	(15) -2,782
1996	(56) 7,457	(56) 16,633	(56) -9,847
1997	(71) 29,013	(71) 58,070	(71) -29,731

[Total]

FY	Operating profit	Operating expense	Recurring profit or loss
1994	(17) 47,003	(17) 45,514	(17) -6,209
1995	(17) 59,321	(17) 54,493	(17) 3,820
1996	(58) 68,515 [15.5]	(58) 67,031 [23.0]	(58) 54 [-98.6]
1997	(73) 91,286 [33.2]	(73) 112,021 [67.1]	(73) -21,981 [-¥22.0 bil.]

Note: Figures in parentheses indicate increase or decrease from the previous fiscal year.

Source: MPT

Appendix 9 Financial status of cable television operators

(Unit: one million yen, %)

FY	Operating profit	Operating expense	Operating profit or loss	Recurring profit or loss
1994	98,415 (27.0)	110,688 (19.2)	-12,273 (-20.1)	-17,757 (-17.7)
1995	112,554 (14.4)	119,470 (7.9)	-6,916 (-43.6)	-12,698 (-28.5)
1996	140,991 (25.3)	153,821 (28.8)	-12,830 (85.5)	-10,679 (-15.9)
1997	164,380 (16.6)	182,779 (18.8)	-18,399 (43.4)	-18,056 (69.1)

Note: Figures come only from commercial cable TV operators that broadcast their own programming. Figures in parentheses indicate increase or decrease from the previous fiscal year.

Source: MPT

Appendix 10 Operational satellites for international services (as of March 1999)

Operator	Satellite	No. of transponders		User carriers	Foreign user broadcasters
		C-band	Ku-band		
INTELSAT	604	38	10	KDD, IDC, Japan Telecom	
	602	38	10	KDD, IDC, Japan Telecom	
	804	38	6	KDD	
	505	21	4	KDD	
	802	38	6	KDD, IDC, Japan Telecom	
	704	26	14	KDD, Japan Telecom	
	702	26	10	KDD, Japan Telecom	
New Skies Satellites, N.V.	701	26	10	KDD	
	513	26	6	KDD, IDC	
Columbia Communications Corp. (U.S.)	703	26	10	KDD	
	TDRS-5	12	–	Japan Telecom	
PanAmSat Corp (U.S.)	PAS-2	16	16	KDD, IDC, Japan Telecom	NBC Asia, Turner Entertainment Networks Asia, Westinghouse Broadcasting Company, Fox News Network
	PAS-4	16	24	KDD	
APT Satellite Holdings Ltd. (HK)	Apstar-1	24	–	HCA	Turner Entertainment Networks Asia
	Apstar-1A	24	–	Japan Telecom	
	Apstar-2R	28	16	HCA	
AsiaSat (HK)	Asiasat-1	24	–		STAR TV
	Asiasat-2	24	9	KDD, IDC, Japan Telecom, HCA	Deutsche Velle, MCM International?, Radio France Internationale, Radio Televisione Italiana, Radiotelevisão Portuguesa, Radio Televisión Española, Satellimago TV Cinq, STAR TV
Binarian (Malaysia)?	Measat-1	12	5	KDD	

Sources: "FY 1998 Satellite Communications Yearbook," KDD Engineering and Consulting, and telecommunications carriers involved.

Appendix 11 Changes in number of radio stations

FY	Grand total	Fixed	Fixed Aeronautical	Broadcasting	Broadcasting Test	Coastal	Aeronautical	Base	Cellular Base	Paging Base	Land Mobile Relay	Ship	Automatic Distress Informing
1988	4,954,570	46,313	30	31,683	12	1,387	1,148	64,009	2,754	3,262	1,018	89,434	557
1989	5,611,221	49,420	30	32,175	0	1,380	1,237	73,197	2,815	3,522	2,920	92,701	477
1990	6,468,211	51,662	29	36,407	0	1,385	1,398	83,650	2,898	3,826	7,300	91,975	406
1991	7,574,467	55,874	29	37,503	0	1,421	1,595	90,957	2,950	3,822	12,611	92,328	352
1992	8,289,603	58,350	29	38,098	0	1,428	1,791	90,058	3,009	3,840	18,040	90,618	325
1993	8,392,055	57,919	29	38,676	0	1,447	1,910	77,610	3,086	3,859	266	86,932	262
1994	10,833,755	63,280	28	39,344	0	1,455	1,929	76,985	3,069	3,639	341	85,265	167
1995	17,315,536	65,589	29	39,694	0	1,451	1,937	303,371	3,104	3,564	351	85,084	147
1996	29,211,483	67,360	29	40,328	1	1,395	1,930	526,627	3,097	3,274	900	83,513	144
1997	39,478,889	71,266	30	32,016	1	1,399	2,293	728,787	3,359	3,263	1,220	83,818	146

Appendix

FY	On-board Communications	Aircraft	Radio Determination	Earth	VSAT Control Earth	VSAT Earth	Aeronautical Earth	Aircraft Earth	Coastal Earth	Ship Earth	Cellular Base Earth	Cellular Mobile Earth	Base Earth	Land Mobile Earth	Space	Artificial Satellite
1988	2,360	1,978	25,020	192						739					0	46
1989	2,396	2,238	27,745	569						936					0	49
1990	2,473	2,424	29,589	855	6	1,066	1	1	3	1,090					0	55
1991	2,552	2,558	31,268	1,070	10	1,157	2	10	2	1,206					0	56
1992	2,671	2,550	23,042	1,272	10	2,597	4	18	2	1,342					0	60
1993	2,741	2,564	19,516	1,340	31	3,227	3	17	1	1,339			1	189	0	68
1994	3,039	2,406	21,907	1,337	37	3,793	4	34	2	1,380			1	352	0	75
1995	2,895	2,394	22,168	1,396	50	4,279	2	37	2	1,397			1	1,066	0	50
1996	3,099	2,444	23,874	1,911	11	5,519	2	46	2	1,323	5	9,485			0	60
1997	3,081	2,527	22,110	2,141	31	6,925	1	57	2	1,321	5	19,669			0	77

FY	Broadcasting Satellite	Broadcasting Test Satellite	Emergency	Experimental	Development Test	Amateur	Premises Radio	Meteorological Aid	Standard Frequency	Special Service	Land Mobile	Cellular	Simple Radio
1988	0	4	59	1,658	66	916,904	993	599	1	153	1,452,115	41,647	2,268,429
1989	4	0	57	1,703	20	1,027,101	1,591	605	1	202	1,916,022	49,055	2,321,053
1990	7	0	32	1,605	144	1,101,431	3,018	598	1	283	2,580,562	51,699	2,410,332
1991	8	2	21	1,140	714	1,203,226	4,027	569	1	339	3,496,692	55,134	2,473,261
1992	13	2	0	820	1,227	1,283,185	1,741	440	1	361	4,097,763	58,905	2,505,991
1993	12	2	0	6,182	999	1,325,527	4,562	481	1	391	5,051,440	58,387	1,641,038
1994	13	0	0	4,499	75	1,364,316	4,214	422	1	440	7,769,664	55,081	1,325,161
1995	15	0	0	3,371	36	1,350,127	4,147	422	1	464	14,192,116	51,817	1,172,962
1996	18	0	0	3,141	248	1,296,059	4,524	505	1	1,749	25,974,504	52,135	1,102,220
1997	19	2	0	4,044	397	1,219,907	4,486	598	1	2,658	36,192,215	45,268	1,023,749

Appendix 12 Number of radio stations by use (as of the end of fiscal 1997)

Type \ Usage	Grand total	Fixed	Fixed Aeronautical	Broadcasting	Broadcasting Test	Coastal	Aeronautical	Base	Cellular Base	Paging Base	Land Mobile Relay	Ship	Automatic Distress Informing	On-board Communications	Aircraft	Radio Determination	Earth	VSAT Control Earth	VSAT Earth	Aeronautical Earth
Grand total	39,478,889	71,266	30	32,016	1	1,399	2,293	728,787	3,359	3,263	1,220	83,818	146	3,081	2,527	22,110	2,141	31	6,925	1
Telecommunications	34,896,895	3,823	0	0	0	8	56	660,111	219	1,780	633	0	0	0	0	0	1,670	31	6,925	1
Land transport	436,877	500	0	0	0	0	0	20,358	26	24	0	0	0	0	0	145	0	0	0	0
Water/Marine transport	19,727	19	0	0	0	186	0	27	42	0	0	4,773	1	21	0	9,255	0	0	0	0
Air transport	7,846	57	14	0	0	0	1,620	225	0	0	0	1	0	0	2,192	448	0	0	0	0
News distribution	4,781	43	0	0	0	0	21	511	386	0	0	0	0	0	16	0	0	0	0	0
Broadcasting	59,630	1,304	0	32,016	1	0	0	525	494	0	0	0	0	0	0	38	110	0	0	0
Fisheries	74,632	345	0	0	0	699	0	29	63	0	0	70,668	0	0	0	1,545	0	0	0	0
Gas	7,231	1,147	0	0	0	0	0	665	10	4	0	0	0	0	0	0	0	0	0	0
Heat supply	18	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Electric power	40,254	4,014	0	0	0	0	0	2,832	585	1	0	0	0	0	0	42	0	0	0	0
Water	12,500	921	0	0	0	0	0	782	1	1	0	0	0	0	0	1	0	0	0	0
Ports	5,942	20	0	0	0	39	0	162	35	0	0	573	1	2,604	0	127	0	0	0	0
Harbors	1,844	31	0	0	0	0	0	114	19	0	0	17	0	0	0	36	0	0	0	0
Flood control/ Waterways/Road	43,360	15,648	0	0	0	0	0	2,753	299	0	20	4	0	0	0	128	0	0	0	0
Civil engineering	71,393	8	0	0	0	0	0	4,718	4	1	0	4	0	0	0	10	0	0	0	0
Mining	1,082	63	0	0	0	0	0	92	8	0	0	4	0	0	0	1	0	0	0	0
Financial/Insurance	2,432	0	0	0	0	0	0	402	0	1	0	0	0	0	0	0	0	0	0	0
Manufacturing/Sales	157,662	0	0	0	0	0	0	7,788	40	20	0	0	0	0	0	249	0	0	0	0
Warehousing	538	0	0	0	0	0	0	12	0	0	0	0	0	0	0	4	0	0	0	0
Real estate	395	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0
Services	35,570	3	0	0	0	0	0	1,741	9	65	0	0	0	0	0	13	0	0	0	0
Agriculture	20,833	1,326	0	0	0	0	0	1,084	0	1	0	0	0	0	0	4	0	0	0	0
Forestry	8,483	99	0	0	0	0	0	574	0	0	0	1	0	0	0	0	0	0	0	0
Firefighting	90,794	4,909	0	0	0	0	69	3,373	78	9	0	25	0	0	31	14	0	0	0	0
Firefighting/Disaster control	291	274	0	0	0	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0
Emergency medicine	5,694	46	0	0	0	0	0	253	63	19	0	2	0	0	0	0	0	0	0	0
Rescue	576	7	0	0	0	0	0	13	9	0	0	6	142	0	0	0	0	0	0	0
Weather	1,656	219	0	0	0	0	0	79	4	0	0	7	0	0	0	19	257	0	0	0
Disaster-control administration	146,196	28,707	0	0	0	0	31	4,112	272	2	166	6	0	0	8	7	0	0	0	0
Local government administration	2,009	120	0	0	0	0	0	114	2	2	0	0	0	0	0	4	0	0	0	0
Pollution control	490	425	0	0	0	0	0	17	1	0	0	1	0	0	0	3	0	0	0	0
Security	9,286	1,698	0	0	0	0	0	921	0	0	0	1	0	0	0	90	0	0	0	0
Space development	133	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	27	0	0	0
Education	2,748	15	0	0	0	3	7	496	23	1	0	101	0	0	49	37	0	0	0	0
Academic research	831	43	0	0	0	0	0	21	3	0	0	1	0	0	0	11	0	0	0	0
National governmental activities other than those listed above	161,550	4,575	13	0	0	220	351	3,867	594	0	110	493	0	0	147	7,845	5	0	0	0
Diplomatic	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amateur	1,219,907	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sports/Leisure	9,280	2	0	0	0	197	0	17	3	0	0	6,692	0	0	0	52	0	0	0	0
Simple radio	714,952	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Personal	308,797	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MCA	844,345	0	0	0	0	0	0	7,578	0	0	265	0	0	0	0	0	0	0	0	0
Others	49,426	851	3	0	0	47	138	2,404	64	1,332	26	437	2	456	84	1,982	72	0	0	0

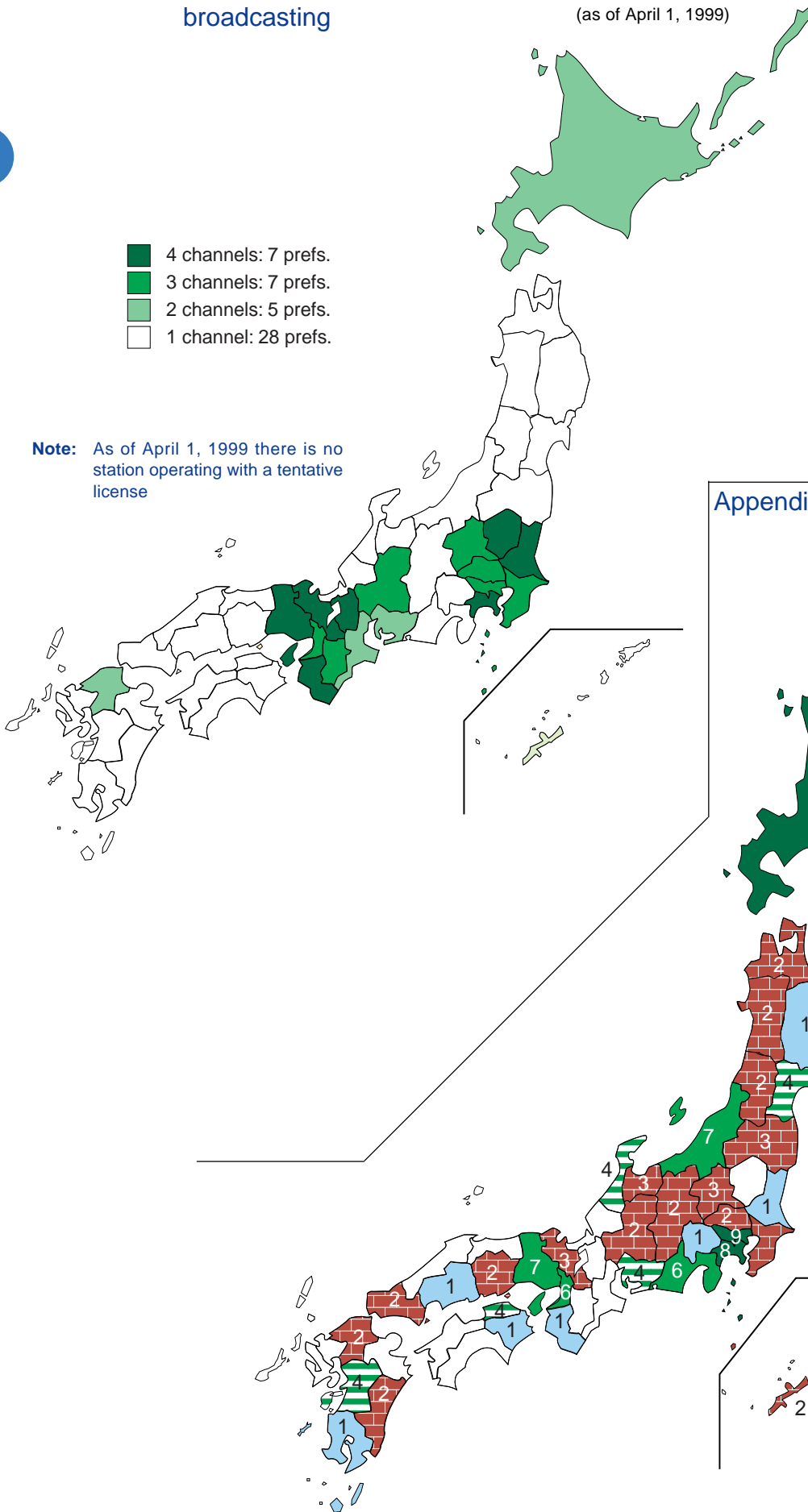
Type \ Usage	Aircraft Earth	Coastal Earth	Ship Earth	Cellular Base Earth	Cellular Mobile Earth	Base Earth	Land Mobile Earth	Space	Artificial Satellite	Broadcasting Satellite	Broadcasting Test Satellite	Emergency	Experimental	Development Test	Amateur	Premises Radio	Meteorological Aid	Standard Frequency	Special Service	Mobile	Land Mobile	Cellular	Simple Radio
Grand total	57	2	1,321	0	0	5	19,669	0	77	19	2	0	4,044	397	1,219,907	4,486	598	1	2,658	0	36,192,215	45,268	1,023,749
Telecommunications	57	2	1,321	0	0	5	19,669	0	24	0	0	0	0	0	0	0	0	0	0	0	34,186,862	13,698	0
Land transport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	415,589	235	0
Water/Marine transport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	314	5,089	0
Air transport	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	3,234	30	0
News distribution	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,183	1,621	0
Broadcasting	0	0	0	0	0	0	0	0	15	19	0	0	0	8	0	0	0	0	0	0	17,588	7,512	0
Fisheries	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	626	656	0
Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,383	22	0
Heat supply	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0
Electric power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	32,381	392	0
Water	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,791	3	0
Ports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,835	546	0
Harbors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,033	594	0
Flood control/ Waterways/Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	134	0	435	0	23,620	319	0
Civil engineering	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66,456	192	0
Mining	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	731	183	0
Financial/Insurance	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,029	0	0
Manufacturing/Sales	0	0	0	0	0	0	0	0	0	0	0	0	913	0	0	0	0	0	0	0	148,121	531	0
Warehousing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	522	0	0
Real estate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	382	0	0
Services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33,637	102	0
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,416	2	0
Forestry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,809	0	0
Firefighting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81,060	1,226	0
Firefighting/Disaster control	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9	0
Emergency medicine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,066	245	0
Rescue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	342	57	0
Weather	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	419	0	3	0	587	58	0
Disaster-control administration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110,933	1,952	0
Local government administration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,751	16	0
Pollution control	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	2	0
Security	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,576	0	0
Space development	0	0	0	0	0	0	0	26	0	0	0	0	28	0	0	0	0	0	0	0	8	41	0
Education	0	0	0	0	0	0	0	0	0	0	0	0	208	0	0	0	2	0	0	0	1,627	179	0
Academic research	0	0	0	0	0	0	0	0	0	0	0	0	132	0	0	1	0	0	0	0	553	66	0
National governmental activities other than those listed above	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	295	0	135,007	8,023	0
Diplomatic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amateur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,219,907	0	0	0	0	0	0	0	0
Sports/Leisure	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,159	158	0
Simple radio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	714,952
Personal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	308,797
MCA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	836,502	0	0
Others	0	0	0	0	0	0	0	8	0	2	0	2,757	389	0	4,485	36	1	1,900	0	0	30,441	1,509	0

Appendix 13 Current operational status of commercial AM radio broadcasting

(as of April 1, 1999)

- 4 channels: 7 prefs.
- 3 channels: 7 prefs.
- 2 channels: 5 prefs.
- 1 channel: 28 prefs.

Note: As of April 1, 1999 there is no station operating with a tentative license

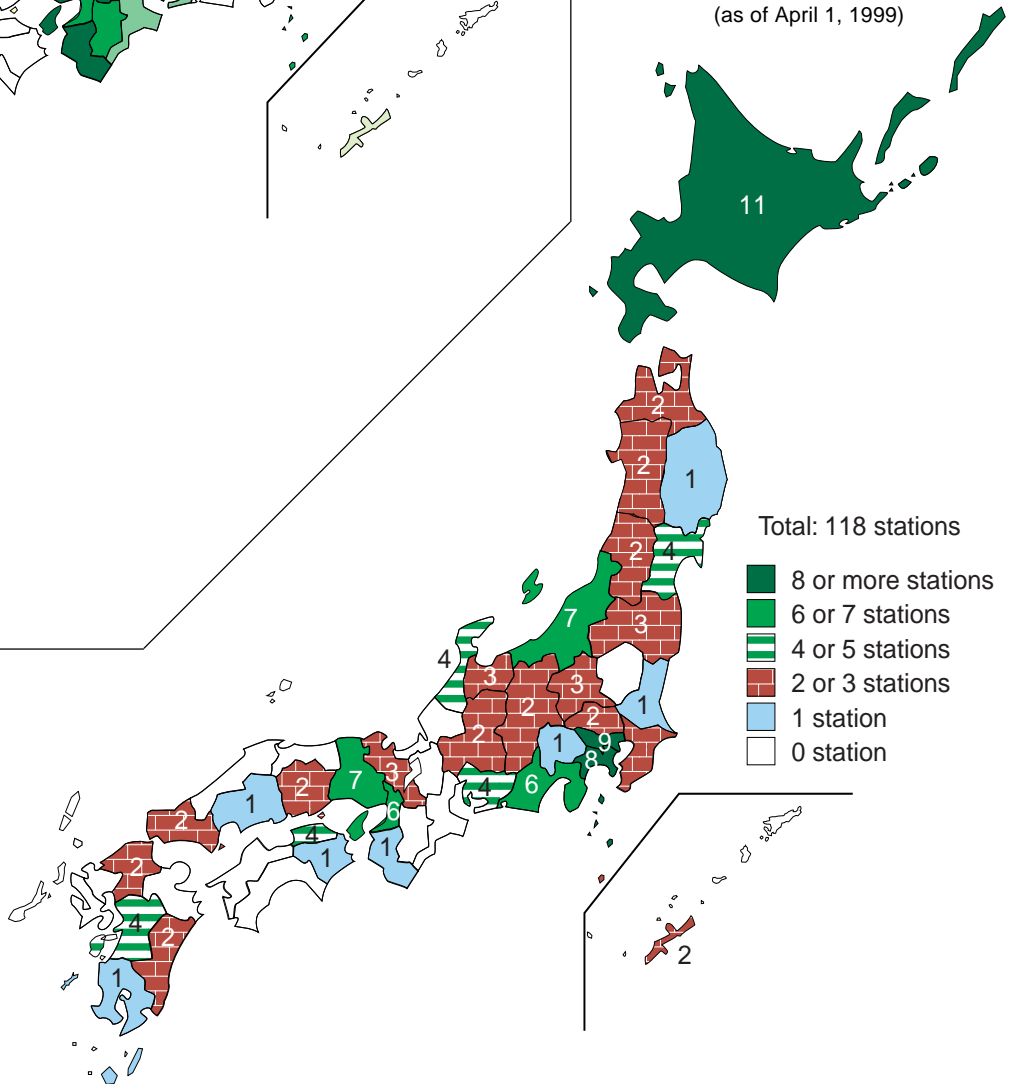


Appendix 14 Current operational status of community broadcasting

(as of April 1, 1999)

Total: 118 stations

- 8 or more stations
- 6 or 7 stations
- 4 or 5 stations
- 2 or 3 stations
- 1 station
- 0 station



Appendix 15 Trends in number of broadcasting stations (Terrestrial; by type of broadcasting)

Categories	FY		1994	1995	1996	1997	1998
AM radio broadcasting	NHK	Channel 1	205	205	207	210	210
		Channel 2	140	140	140	140	140
		Total	345	345	347	350	350
	Commercial broadcasters		240 (47)	243 (47)	248 (47)	255 (47)	259 (47)
	Total		585	588	595	605	609
Shortwave broadcasting	NHK		2	2	2	2	2
	Commercial broadcasters		2 (1)	2 (1)	2 (1)	2 (1)	2 (1)
	Total		4	4	4	4	4
FM radio broadcasting	NHK		514	515	516	518	519
	University of the Air Foundation		2	2	2	2	2
	Commercial broadcasters	Prefectural	221 (44)	231 (47)	237 (49)	243 (49)	257 (50)
		Community	18 (16)	34 (30)	73 (68)	100 (93)	127 (118)
		Total	239	265	310	343	384
	Total		755	782	828	863	905
FM audio multiplex broadcasting	Commercial broadcasters		3 (1)	3 (1)	0 (0)	0 (0)	0 (0)
FM teletext multiplex broadcasting	NHK		0	51	51	51	51
	Commercial broadcasters		1 (1)	204 (37)	225 (39)	280 (39)	309 (44)
Standard TV broadcasting	NHK	General	3,492	3,488	3,490	3,490	3,487
		Education	3,415	3,412	3,416	3,416	3,415
		Total	6,907	6,900	6,906	6,906	6,902
	University of the Air Foundation		3	3	3	3	3
	Commercial broadcasters		7,736 (121)	7,936 (123)	8,075 (126)	8,185 (126)	8,262 (127)
	Total		14,646	14,839	14,984	15,094	15,167
TV audio multiplex broadcasting	NHK		6,907	6,900	6,906	0	0
	Commercial broadcasters		7,194 (118)	7,407 (121)	7,588 (125)	4,546 (68)	2,281 (28)
	Total		14,101	14,307	14,494	4,546	2,281
TV teletext multiplex broadcasting	NHK		3,492	3,488	3,490	3,490	3,487
	Commercial broadcasters		5,570 (24)	5,410 (23)	5,423 (24)	5,199 (24)	5,179 (22)
	Total		9,062	8,898	8,913	8,689	8,666
TV data multiplex broadcasting	NHK		--	--	0	0	0
	Commercial broadcasters		--	--	194 (2)	741 (9)	1,004 (16)
	Total		--	--	194	741	1,004
Combination of TV teletext multiplex broadcasting and TV data multiplex broadcasting	NHK		--	--	--	0	0
	Commercial broadcasters		--	--	--	1,116 (16)	1,138 (16)
	Total		--	--	--	1,116	1,138
Relay broadcasting stations via satellite (NHK)	Standard TV broadcasting		6	6	6	6	6
	Sound multiplex broadcasting		6	6	6	0	0
	Total		12	12	12	6	6
Total	NHK		18,179	18,213	18,230	11,323	11,311
	University of the Air Foundation		5	5	5	5	5
	Commercial broadcasters		20,985 (205)	21,470 (222)	22,065 (266)	22,667 (290)	18,818 (317)
Total			39,169	39,688	40,300	31,995	30,134

Notes: 1. Number of stations includes number of relay stations.

2. Numbers in parentheses for commercial broadcasting indicate number of companies.

3. Shortwave broadcasting stations for NHK include number of international relay broadcasting stations.

4. Excluding 27 broadcasting stations providing relay broadcasting in order to cope with wave recipient difficulties.

5. "Relay broadcasting stations via satellite" are relay stations whose key stations are satellite broadcasting stations.

Appendix 16 Outlines of telecommunications services

Categories	Service names	Outlines of services
Voice transmission	Internet telephony	It enables users to make a call from an ordinary telephone set by connecting conventional telephone network at both ends of the Internet which is used as a transit network. By using the Internet whose communications cost is low, Internet telephony realizes inexpensive service prices.
	ISDN	It is a comprehensive service for providing information in a variety of forms including sound, pictures and data through digital communications network.
	Satellite cellular phone	It is a service offering voice communications via communications satellite. Using the system, users can communicate with anybody from anywhere the global surface where no offer telecommunications facilities are available.
	Cellular/Car phone	It enable users to communicate with each other between a cellular terminal or a car-mounted radio station and subscriber lines or other network.
	PHS	The "Personal Handyphone System" is a simplified version of the cellular phone, initially invented by modifying a cordless phone to enable use of a slave unit outdoors. Compared with cellular or car phones, the coverage area of a PHS cell is smaller; thus the devices cannot be used from a moving vehicle, for example. However, PHS service charges are lower than for cellular phone services, PHS terminals are lighter and high-speed data transmission is possible at a speed of 32 kbps or 64 kbps.
	Paging service	It is a type of mobile communications service that calls a pager terminal with radio from a base station utilizing conventional PSTN.
	Aircraft public phone	It is a public phone installed in an aircraft which enables users to make a call from an aircraft in flight to their home or office on the global surface.
Train public phone	It is a public phone installed on a train which enables users to make a call from a running train to their home or office.	
Leased circuit	Ordinary leased circuit	Two types of services are available: the frequency band-use service is an analog type service which is suitable for telephone and fax; the code transmission service is a digital type service which is suitable for data transmission.
	High-speed digital transmission	It is a high-speed, large-capacity leased circuit services. Any kind of data transmission is available including voice, data and moving pictures.
	ATM leased circuit	It is a leased circuit service employing not a conventional high-speed digital transmission system but an ATM transmission system.
Data transmission	Packet switching	It is a high-speed data transmission service. In this system, data are divided into packets with a certain length, added headers which indicate the address of those packets, stored in a switch for a while, and then transmitted at a high speed over the network.
	Frame relay	Compared with the packet switching service, processing on the network side of the frame relay is simplified, and it enables speeds of several Mbps data transmission. It can deal with burst like traffic on data transmission between LAN networks. Frame relay realizes high-speed, large-capacity communications between companies.
	Cell relay	It provides an ultrahigh-speed data transmission service with up to 135 Mbps. Cell relay realizes communications between large-scale LAN networks. By fixing packet length to 53 bytes, processing on the network side of the cell relay is simplified even further than with frame relay.
	Internet access	It provides Internet access service. It is a routing service based on the Internet protocol and is suitable for computer communications.
	Internet gateway	It provides international backbone networks for Internet-use, used mainly by ISPs in Japan.

Appendix 17 Trends in subscriber telephone traffic

Category	Fiscal year	1993	1994	1995	1996	1997
Number of calls (1 million calls)	Local calls (within the same MA)	51,282	52,860	52,192	52,672	49,177
	Within 100 km	21,143	22,786	24,635	27,187	25,353
	Over 100 km	7,017	7,614	7,883	8,370	8,281
	Total	79,443	83,261	84,710	88,229	82,811
Total call duration (1 million hours)	Local calls (within the same MA)	2,181	2,227	2,180	2,166	2,114
	Within 100 km	1,179	1,249	1,240	1,227	1,125
	Over 100 km	433	465	469	468	450
	Total	3,794	3,941	3,888	3,862	3,689

Appendix

Appendix 18 Trends in international phone traffic

Category	Fiscal year	1992	1993	1994	1995	1996	1997
Number of calls (1 million)	Outgoing calls	267.7 (8.6%)	291.8 (9.0%)	324.0 (11.1%)	358.4 (10.6%)	386.4 (7.8%)	405.6 (5.0%)
	Incoming calls	213.7 (7.4%)	234.7 (9.8%)	275.4 (17.3%)	324.8 (17.9%)	374.8 (15.4%)	392.9 (4.8%)
Total call duration (1 million hours)	Outgoing calls	1283.5 (10.6%)	1411.2 (9.9%)	1524.8 (8.0%)	1631.3 (7.0%)	1710.6 (4.9%)	1771.7 (3.6%)
	Incoming calls	891.5 (6.5%)	981.2 (10.1%)	1140.0 (16.2%)	1320.8 (15.8%)	1519.1 (15.0%)	1635.0 (7.6%)
Differences in total duration (minutes) between incoming and outgoing calls		392.0 (21.1%)	430.0 (-9.7%)	384.8 (-10.7%)	310.4 (-19.2%)	191.5 (-38.3%)	136.7 (-28.6%)

Note: Figures in parentheses indicate rate of change from the previous fiscal year.

Appendix 19 Trends in number of ordinary leased circuit

(Unit: Number of circuits)

Category	Fiscal year	1993	1994	1995	1996	1997	
Frequency band-use service	Free use	3.4kHz	375,123	384,081	393,860	388,548	372,674
		3.4kHz (S)	8,655	8,625	9,862	8,236	7,463
	Service for specific purpose	Sound	306,619	298,967	297,763	292,664	275,842
		Music broadcasting	207	199	238	196	188
		AM broadcasting	422	392	391	461	341
		FM broadcasting	32	28	28	28	28
	Others	744	379	286	129	112	
Sub total	691,802	692,671	702,428	690,262	656,648		
Code transmission service	50bps	270,558	273,272	248,789	229,017	205,069	
	2,400bps	5,686	5,759	6,177	5,934	6,111	
	4,800bps	8,596	8,651	8,756	8,772	7,848	
	9,600bps	42,925	45,970	46,536	44,597	40,311	
	Others	16,396	14,045	9,196	5,140	408	
	Sub total	344,161	347,697	319,454	293,460	259,747	
Total	1,035,963	1,040,368	1,021,882	983,722	916,395		

Notes: 1. Figures indicate total numbers of NTT and NCCs.

2. Contracts between NTT and NTT Data are included in this figure, due to separation of NTT Data from NTT.

3. 48 kHz, 240 kHz of frequency band-use services and 100-1,200 bps of the code transmission services are included under "others."

Appendix 20 Trends in high-speed digital transmission service

(Unit: Number of circuits)

Category		Fiscal year	1993	1994	1995	1996	1997
High-speed digital transmission service	High-speed service	64kbps	11,770	21,823	44,564	82,413	127,752
		128kbps	1,460	3,386	8,589	21,755	36,174
		192kbps	2,501	2,746	3,311	4,093	4,608
		256kbps	590	963	1,685	2,957	4,143
		384kbps	2,934	3,022	3,221	3,599	4,146
		512kbps	434	723	1,259	2,133	2,855
		768kbps	2,727	2,694	2,675	2,841	3,284
		1Mbps	287	512	700	1,106	1,471
		1.5Mbps	2,389	2,502	3,212	4,312	5,714
		2Mbps	1	4	5	4	4
		3Mbps	657	750	832	1,016	1,237
		4.5Mbps	79	113	161	241	272
		6Mbps	606	709	818	1,092	1,209
	Subtotal	26,435	39,947	71,032	127,562	192,869	
	Super-high-speed service	32Mbps	2	3	3	1	1
		50Mbps	--	--	45	129	178
150Mbps		1	1	31	63	60	
Subtotal		3	4	79	193	239	
Satellite digital leased circuit service	64kbps	0	0	2	2	0	
	192kbps	2	2	0	0	2	
	384kbps	2	2	4	4	2	
	768kbps	0	0	0	0	0	
	1.5Mbps	0	0	0	0	0	
Satellite video communications services		6	7	7	4	2	
Satellite frequency band-use communications service		--	--	2	10	23	
TV broadcast relay service (number of terminal circuits)		734	742	750	763	772	
Video transmission services		2,779	2,457	3,321	3,680	3,780	
Wireless leased circuit services (number of contracts)		491	488	478	479	481	

Note: Figures indicate total numbers of NTT and NCCs.

Appendix 21 Trends in international leased circuits

(Unit: Number of circuits)

Category		Fiscal year	1992	1993	1994	1995	1996	1997
Voice-grade circuits			435 (64)	328 (70)	285 (87)	189 (69)	190 (70)	158 (59)
Telegraph -grade circuit	12.5bps		8	6	3	3	2	1
	25bps		7	7	6	6	5	4
	50bps		139	133	129	113	101	76
	75bps		68	59	45	37	35	30
	100bps		6	6	4	3	3	2
	200bps		40	34	25	23	18	15
	Subtotal		268	245	212	185	164	128
Middle-speed code transmission circuits			33 (10)	35 (8)	24 (6)	19 (4)	12 (2)	10 (1)
High-speed code transmission circuits			918 (298)	1,068 (329)	1,123 (378)	1,298 (461)	1,405 (517)	1,511 (594)
Grand total			1,654	1,676	1,644	1,691	1,771	1,807

Notes: 1. Voice-grade circuits include number of voice transmission circuits.

2. Figures in parentheses indicate those for NCCs.

3. Figures include circuits used for services that are not written into the tariff.

Appendix 22 Air time and ratio (by type of program, content of program)

(1) NHK (Fiscal 1997)

Category			Average broadcast hours				
			Per week			Per day	
			Hours	Minutes	Ratio	Hours	Minutes
AM radio broadcasting	Radio 1	News	81	09	49.2	11	36
		Education	4	34	2.8	0	39
		Cultural	38	40	23.4	5	31
		Entertainment	40	33	24.6	5	48
		Total	164	56	100.0	23	34
	Radio 2	News	19	35	15.1	2	48
		Education	85	02	65.7	12	09
		Cultural	24	53	19.2	3	33
		Total	129	30	100.0	18	30
FM radio broadcasting		News	15	49	11.6	2	16
		Education	9	20	6.8	1	20
		Cultural	63	24	46.4	9	03
		Entertainment	48	05	35.2	6	52
		Total	136	38	100.0	19	31
Terrestrial TV broadcasting	General TV broadcasting	News	66	05	40.8	9	27
		Education	18	33	11.8	2	39
		Cultural	47	07	29.1	6	45
		Entertainment	30	17	18.7	4	20
		Total	162	14	100.0	23	11
	Educational TV broadcasting	News	3	54	3.0	0	33
		Education	98	52	77.0	14	08
		Cultural	25	38	20.0	3	40
		Entertainment	0	00	0.0	0	00
		Total	128	24	100.0	18	21
Satellite TV broadcasting	BS 1	News	93	26	56.3	13	21
		Education	21	09	12.7	3	02
		Cultural	35	16	21.2	5	02
		Entertainment	16	22	9.8	2	20
		Total	166	13	100.0	23	45
	BS 2	News	23	20	14.1	3	20
		Education	51	40	31.2	7	23
		Cultural	36	57	22.3	5	16
		Entertainment	53	39	32.4	7	40
		Total	165	36	100.0	23	39

Source: "Broadcast program statistics," NHK

(2) Commercial broadcaster (per day, between October 1998 and March 1999)

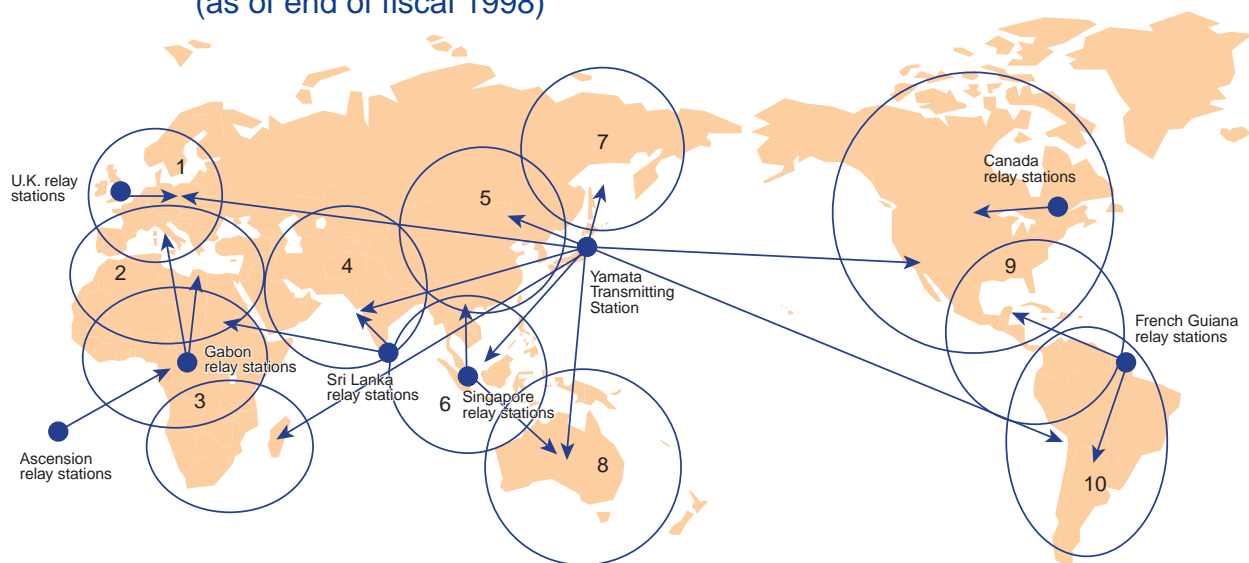
Category	Radio broadcasting			TV broadcasting		
	Broadcast hours		Ratio	Broadcast hours		Ratio
	Hours	Minutes	%	Hours	Minutes	%
News	3	09	13.5	4	07	19.6
Education	0	37	2.7	2	34	12.2
Cultural	3	19	14.2	5	23	25.6
Entertainment	15	45	67.6	8	11	38.9
Advertisement	0	19	1.4	0	30	2.4
Others	0	09	0.6	0	16	1.3
Total (average air time)	23	18	100.0	21	01	100.0
Longest air time	24	00		23	35	
Shortest air time	18	01		18	01	

Notes: 1. Radio broadcasting: figures are average figures of 97 companies including AM radio broadcasters, shortwave broadcasters and FM radio broadcasters.

2. TV broadcasting: figures are average figures for 126 companies.

Source: "Program statistics," National Association of Broadcasters in Japan

Appendix 23 Outlines of shortwave international radio broadcasting (as of end of fiscal 1998)



Appendix

Shortwave international radio broadcasting	
Launch of broadcasting	June 1935
Coverage	Worldwide
Domestic transmitting station	One (Yamata, Ibaraki Prefecture)
Overseas relay stations	Seven sites
Languages	22 languages
Air time	65 hours a day
Programs	Aired due to an order from the Minister of Posts and Telecommunications and NHK's self-motivated broadcasting

1. Targeting Europe
2. Targeting Middle East and North Africa
3. Targeting Africa
4. Targeting South Asia
5. Targeting Continental Asia
6. Targeting Southeast Asia
7. Targeting Northeast Russia
8. Targeting Australia, New Zealand
9. Targeting Central and South America, North America and Hawaii
10. Targeting South America

Appendix 24 Outlines of international TV broadcasting (as of end of fiscal 1998)

Satellite used	Footprint	Air time (per day)	Broadcasting system	Launch of service
PAS-2/8 (C-band)	Asia-Pacific region	18 hours	Digital (nonscrambled)	Apr. 1998
PAS-4 (C-band)	East and West Asia, Central Asia, Middle East, North Africa, Europe	18 hours	Digital (nonscrambled)	Oct. 1998
PAS-5 (C-band)	South and North Americas	18 hours	Digital (nonscrambled)	Oct. 1998
Astra (Ku-band)	Europe	5.5 hours	Analog (nonscrambled)	Apr. 1995
Echo (Ku-band)	North America	5.5 hours	Digital (nonscrambled)	Apr. 1995

Appendix 25 Outlines of program distribution (as of end of fiscal 1998)

(1) NHK

Satellite used	Footprint	Number of broadcasters airing programming distributed by NHK	Air time (per day)	Broadcasting system	Launch of service
PAS-2/8 (C-band)	Asia-Pacific region	45	18 hours	Digital (scrambled)	Apr. 1995 (Apr. 1998)
PAS-4 (C-band)	East and West Asia, Central Asia, Middle East, North Africa, Europe	8	18 hours	Digital (scrambled)	Apr. 1996 (Jun. 1998)
PAS-5 (C-band)	South and North Americas	12	18 hours	Digital (scrambled)	Jul. 1998

Note: Dates in parentheses indicate when the system became digital.

(2) Commercial broadcasters

Project name	Operators	Satellite used	Footprint	Number of subscribers	Air time (per day)	Transmission system	Service launch
JET TV	JETTV	PAS-2/8 (C-band)	Asia-Pacific region	5 million households are passed	About 24 Hs	Digital (scrambled)	Mar. 1997
Program distribution business by NTV	NTV	JCSAT-3 (C-band)	Singapore	Cable TV: 1 operator	About 24 Hs	Digital (scrambled)	April 1998
		PAS-2 (C-band)	Asia-Pacific region	Terrestrial: 1 broadcaster Cable TV: 3 operators	About 24 Hs	Digital (scrambled)	April 1999

Note: 1. JET TV: Japan Entertainment Television
2. NTV: Nippon Television Network Corp.

Appendix 26 Trends in number of mail items handled

(Unit: thousand items)

Fiscal years	1994	1995	1996	1997	1998
Categories					
Grand total	24,036,024	24,785,831	25,485,526	25,763,132	25,915,625
Domestic mail	23,911,544	24,663,055	25,357,701	25,632,511	25,796,374
Letter-post items	23,534,035	24,262,872	24,971,279	25,306,542	25,479,930
Ordinary	22,832,625	23,568,675	24,271,414	24,630,398	24,795,613
Special services	701,410	694,197	699,865	676,144	684,317
Parcels	377,509	400,183	386,422	325,969	316,444
Ordinary	365,348	388,374	372,629	306,937	297,113
Registered	4,269	4,317	3,959	3,649	3,324
Express	7,892	7,492	9,834	15,383	16,007
International mail (dispatched)	124,480	122,776	127,825	130,621	119,251
Letter-post items	117,041	114,869	119,520	122,001	110,175
Parcels	2,942	2,915	2,874	2,627	2,250
EMS	4,497	4,992	5,431	5,993	6,826
International mail (Arrived)	241,480	280,891	301,952	309,324	275,108
Letter-post items	235,868	273,275	294,224	302,551	268,882
Parcels	3,033	3,602	3,386	2,662	2,210
EMS	2,579	4,014	4,342	4,111	4,016

Notes: 1. Grand total number indicates total number of domestic mail items and total number of dispatched international mail items
2. EMS is an international express mail service

Appendix 27 Number of mail items handled in fiscal 1998

(Unit: 1,000, %)

Categories	Total		Post-payment of postage/Payment of postage without affixed postage stamps		Others	
	Number of mail items handled	Change (%)	Number of mail items handled	Change (%)	Number of mail items handled	Change (%)
Grand total	25,915,625	0.6	13,964,124	0.2	11,951,501	1.0
Domestic mail	25,796,374	0.6	13,964,124	0.2	11,832,250	1.2
Ordinary	25,479,930	0.7	13,752,081	0.3	11,727,849	1.2
Letter-post items	24,795,613	0.7	13,540,715	0.0	11,254,898	1.5
First class (letters)	12,821,151	0.8	8,086,307	-0.1	4,734,844	2.3
Standard-sized items	11,478,798	0.6	7,412,930	-0.3	4,065,868	2.3
Non-standard-sized items	1,342,353	2.1	673,377	1.5	668,976	2.8
Second class (postcards)	7,082,911	2.0	4,327,837	1.4	2,755,074	2.9
Third class (authorized periodicals)	1,154,150	-3.6	1,099,479	-4.2	54,671	8.2
Fourth class (correspondence course materials and other items)	36,339	6.6	27,092	4.9	9,247	12.2
New Year's mail	3,673,636	-1.1	--	--	3,673,636	-1.1
Election mail	27,426	84.3	--	--	27,426	84.3
Special service	684,317	1.2	211,366	18.8	472,951	-5.1
Registered	203,608	-8.9	29,090	-6.7	174,518	-9.2
Delivery-recording mail	184,828	39.7	138,290	37.2	46,538	47.7
Express	295,881	-7.7	43,986	-4.1	251,895	-8.2
(Electronic mail)	14,138	-5.2	10,799	-4.4	3,339	-1.1
Parcels	316,444	-2.9	212,043	-2.8	104,401	-3.2
Ordinary	155,288	-4.9	83,246	-5.2	72,042	-4.5
Booklet mail	161,156	-1.0	128,797	-1.2	32,359	0.0
(Ordinary)	297,113	-3.2	199,165	-3.3	97,948	-2.9
(Registered)	3,324	-8.9	792	-10.0	2,532	-8.6
(Express)	6,481	-22.9	3,506	-30.5	2,975	-11.5
(Chilled)	9,526	36.5	8,580	38.4	946	21.8
International mail						
Dispatched	119,251	-8.7	--	--	119,251	-8.7
Arrived	275,108	-11.1	--	--	275,108	-11.1

Notes: 1. Rate (%) of figures for increase or decrease indicate increase or decrease or from the previous fiscal year ("-" symbol (minus) denotes a decrease).
2. Grand total figure includes dispatched domestic and international mail.
3. Figures for electronic mail are included under express mail figures.
4. Numbers for (Ordinary), (Registered) and (Express) are included under ordinary parcel mail or booklet parcels, while (Chilled) is included under ordinary parcels.
5. Booklet parcels were created in September 1998; figures for booklet parcels are total numbers for book parcels and catalog parcels between April 1998 and August 1998 plus booklet parcels from September 1998, while comparison figures for booklet parcels indicate differences between total figures and total figure for book and catalog parcels figures in fiscal 1997.

Appendix 28 Changes in Corporate Service Price Indexes (CSPI) (domestic telecommunications services)

(100 = Average CSPI for 1990)

Quarter \ Service	Average CSPI for 1990	1991-I	1991-II	1991-III	1991-IV	1992-I	1992-II	1992-III	1992-IV	1993-I	1993-II	1993-III
All corporate services	100	101.6	102.9	103.6	103.7	103.9	105.0	105.0	105.0	104.9	105.4	105.1
All domestic telecommunications services	100	98.5	96.5	96.5	96.5	96.4	95.3	93.8	93.7	93.7	93.7	93.7
Telephone services	100	97.4	96.3	96.3	96.3	96.3	95.1	93.0	93.0	93.0	93.0	93.0
Leased circuit services	100	98.4	96.0	96.0	96.0	96.0	96.0	96.0	94.7	94.6	94.6	94.6
Cellular/car phone services	100	96.7	90.1	89.8	89.2	89.2	89.2	89.2	87.6	87.1	87.1	87.1
Radio paging services	100	96.6	95.2	95.2	95.2	95.2	94.9	94.4	93.5	93.5	93.5	93.5
Value-added communications services	100	99.3	98.8	98.8	98.8	98.8	96.8	96.8	96.8	96.8	96.8	96.8

Quarter \ Service	1993-IV	1994-I	1994-II	1994-III	1994-IV	1995-I	1995-II	1995-III	1995-IV	1996-I	1996-II	1996-III
All corporate services	104.6	104.6	104.3	103.7	103.3	103.1	103.0	102.8	102.4	102.2	102.2	102.0
All domestic telecommunications services	89.3	89.0	88.5	88.3	88.2	89.3	89.8	89.5	88.4	87.9	87.9	87.0
Telephone services	86.9	86.7	86.7	86.7	86.7	88.8	89.8	89.8	89.8	89.2	88.0	88.0
Leased circuit services	94.6	92.1	90.4	90.4	90.4	90.4	90.4	85.8	72.4	72.4	72.7	72.7
Cellular/car phone services	87.1	87.1	83.2	83.2	80.4	74.8	71.3	69.3	66.2	62.8	61.0	59.0
Radio paging services	93.5	93.5	93.5	93.5	93.5	88.2	84.5	84.5	84.5	84.5	84.5	84.5
Value-added communications services	96.8	96.7	94.6	93.7	93.7	93.7	93.7	93.7	93.2	93.2	93.2	93.2

Quarter \ Service	1996-IV	1997-I	1997-II	1997-III	1997-IV	1998-I	1998-II	1998-III	1998-IV
All corporate services	101.8	101.9	103.6	103.6	103.4	103.6	103.4	103.0	102.5
All domestic telecommunications services	86.9	85.6	86.9	86.8	86.6	84.9	84.8	84.8	84.8
Telephone services	88.0	86.3	88.0	88.0	88.0	85.6	85.6	85.6	85.6
Leased circuit services	72.7	72.7	74.1	74.1	74.1	74.1	74.0	74.0	74.0
Cellular/car phone services	57.3	50.7	47.8	45.1	40.8	40.1	38.7	38.7	37.8
Radio paging services	84.5	84.6	86.1	86.1	84.3	84.3	83.1	83.1	83.1
Value-added communications services	93.2	93.2	94.3	94.2	94.2	94.2	94.2	94.2	94.2

Notes: 1. I, II, III and IV in this table indicate the quarter of each calendar year.

2. Value-added communications includes communications, resale of circuits as well as email/fax and packet switching communications.

Source: "Monthly Report on the Wholesale Price Indexes," the Bank of Japan

Appendix 29 Outline of major changes in communications service charges in fiscal 1998 (domestic telecommunications services)

Categories	Operators	Implementation of new services	Summary of change in call charges
Domestic telephone services	DDI	April 1998	Introduced a new meter-rate system for dial-up communications services for DION <ul style="list-style-type: none"> • 10 yen for one minute during daytime on weekdays, in the evening, and on weekends • 8.5 yen for one minute during late-nights and early-mornings
	TITUS Communications	July 1998	Revised its service charges <ul style="list-style-type: none"> • Local call charge was changed from previous 10 yen to nine yen for three minutes, during daytime on weekdays, in the evening, late-nights and early-mornings. • Over 100 kilometers long-distance call for three minutes: costs 72 yen during daytime, 63 yen in the evening and 45 yen late-nights.
	Japan Telecom	December 1998	Pushed down charges for a local call from the quick line <ul style="list-style-type: none"> • Local call charge was changed from the previous 16 yen to 9 yen for 3 minutes
Domestic leased circuits	DDI, Japan Telecom, Teleway	June 1998	Revised leased circuit charges (for both high-speed digital transmission service and ordinary-class services)
Cellular and car phones	Cellular Group, NTT DoCoMo Group, Digital TU-KA Group	April 1998	Decreased communications charges for calls from a cellular and/or car telephones to an ASTEL PHS terminal linked to the NTT network Example: the charges for calls from subscribers to Kansai Cellular services for three minutes during daytime on weekdays were decreased from the previous 240 yen to 150 yen.
	TU-KA Cellular Tokai	April 1998	A decrease of the basic monthly rate and introduction of a new price zone <ul style="list-style-type: none"> • Super Business Plan The basic monthly charge was decreased from the previous 6,400 yen to 6,000 yen. The communications charge for a call within 10 seconds costs 10 yen.
	Digital TU-KA Chugoku, Digital TU-KA Shikoku	April 1998	The basic monthly charge for a heavy user plan called "Business 20" was decreased <ul style="list-style-type: none"> • A subscriber who uses 2-9 circuits: decreased the monthly fee from the previous 600 yen to 400 yen per line • A subscriber who uses 10 circuits or more: decreased the monthly fee from the previous 6,000 yen to 4,000 yen (for all)
	NTT DoCoMo Group	April 1998	Revised the discount rate for its volume discount programs: <ul style="list-style-type: none"> • From 5,000 yen to 10,000 yen: introduced anew a discount of 5% • From 10,000 yen to 20,000 yen: increased the discount rate from the previous 5% to 10% • From 20,000 yen to 30,000 yen: increased the discount rate from the previous 7% to 10%
	Digital TU-KA Hokkaido Digital TU-KA Hokuriku	May 1998	Revised the basic monthly rate and the discount rate for communications rates for large corporate user program called "Business Discount" For instance, in case of Digital TU-KA Hokkaido <ul style="list-style-type: none"> • Business Discount 10: revised the monthly basic rate from the previous 2,500 yen to 2,000 yen • Business Discount 15: revised the monthly basic rate from the previous 5,000 yen to 4,500 yen In addition, revised the discount rate for communications rates from the previous 15% to 15% for up to 150,000 yen and 20% for more than 150,000 yen

Continued on next page

Category	Carriers	Implementation of new services	Summary of change in call charges
Cellular and car phones	NTT DoCoMo Group Cellular Group IDO	June 1998 Oct. 1998 December 1998	A decrease in their communications rates For instance, in case of NTT DoCoMo Group (1) Communications fee for calls from NTT's subscribers lines to cellular phone and/or car phone was revised <ul style="list-style-type: none"> Local call within MA (for three minutes, during daytime on weekdays) was revised from the previous 180 yen to 150 yen (2) Revised its communications rate charging system <ul style="list-style-type: none"> Communications rate for a call to a cellular terminal and/or a car phone was divided into two categories: within MA and outside MA
	Digital TU-KA Kyushu, Digital TU-KA Chugoku, Digital TU-KA Hokuriku, Digital TU-KA Shikoku	April 1998	Revised their discount rates for long-term customers For instance, in case of DoCoMo Group <ul style="list-style-type: none"> Different discount rate was applied depending upon the length of subscribers' contract terms by year
	NTT DoCoMo Group Chugoku Cellular, Shikoku Cellular	June 1998	From one year to two years: 7% From two years to three years: 8% From three years to four years: 10%
	IDO, Kansai Cellular, Kyushu Cellular, Okinawa Cellular, TU-KA Cellular Tokai	July 1998	From four years to five years: 12% Longer than five years: 15%
	Hokkaido Cellular, Hokuriku Cellular	August 1998	
	Tohoku Cellular	Sep. 1998	
	NTT DoCoMo Central, NTT DoCoMo Tokai, NTT DoCoMo Kansai	July 1998	Decreased the basic monthly charges for 1.5-GHz users For instance, the monthly basic charge for Plan A was decreased from the previous 3,700 yen to 3,400 yen
	NTT DoCoMo Central, NTT DoCoMo Tokai, NTT DoCoMo Kansai	July 1998	Decreased their communications rate (revised communications rates for their low-call plan) For instance, in case of NTT DoCoMo Group (for 800 MHz digital system, Plan B) <ul style="list-style-type: none"> Decreased from the previous 1.5 times higher than Plan A to 1.4 times higher than Plan A
	NTT DoCoMo Group, TU-KA Cellular Tokyo	December 1998	
	Digital TU-KA Hokkaido, Digital TU-KA Tohoku, Digital TU-KA Hokuriku, Digital TU-KA Chugoku, Digital TU-KA Shikoku, Digital TU-KA Kyushu, Tokyo Digital Phone, Tokai Digital Phone, Kansai Digital Phone	January 1999	Notes: 1. In July 1998 three NTT Group companies revised their charges for 1.5 GHz users. 2. In December 1998 the NTT Group revised their charges for 800 MHz users.
	Kansai Cellular, Kyushu Cellular and Okinawa Cellular	January 1999	Decreased their basic monthly charges for CDMA system For instance, in case of Kansai Cellular <ul style="list-style-type: none"> Plan A: revised the basic monthly charge from the previous 4,800 yen to 4,600 yen Plan B: revised the basic monthly charge from the previous 3,600 yen to 3,500 yen
	TU-KA Cellular Tokai Digital TU-KA Chugoku Digital TU-KA Hokkaido, Digital TU-KA Hokuriku TU-KA Cellular Tokai	Oct. 1998 Dec. 1998 Jan. 1999 Feb. 1999	Revised the basic monthly plan including communications charges. For instance, in case of TU-KA Cellular Tokai (Free Talk Super, implemented in October 1998) <ul style="list-style-type: none"> Basic charges including communications fees: revised from the previous 2,400 yen to 2,600 yen
	NTT DoCoMo Group Cellular Group, Digital TU-KA Hokkaido, Digital TU-KA Tohoku, Digital TU-KA Hokuriku, Digital TU-KA Chugoku, Digital TU-KA Shikoku, Digital TU-KA Kyushu, Kansai Digital Phone, TU-KA Phone Kansai	Dec. 1998 Jan. 1999	Decreased their basic monthly fee For instance, in case of NTT DoCoMo Group (800 MHz digital system Plan A) <ul style="list-style-type: none"> Revised the monthly fee from the previous 4,900 yen to 4,600 yen

Category	Carriers	Implementation of new services	Outline of new services
Cellular and car phones	NTT DoCoMo Group	February 1999	Communications fees for the following calls were reduced: (1) Calls from a cellular phone or a car phone to the NTT's subscribers lines (2) Calls from a cellular phone or a car phone to a cellular phone or a car phone (3) Calls from a cellular phone or a car phone to a PHS terminal For instance, in case of NTT DoCoMo (800 MHz digital system, Plan A, a 3-minute call within the same prefecture) <ul style="list-style-type: none"> Communications fee for a call from a cellular phone or a car phone to the NTT subscribers line was decreased from the previous 110 yen to 100 yen
	TU-KA Cellular Tokai	February 1999	Decreased its basic monthly charges Introduction of a new discount program for users who have used the carriers' service for two years or longer <ul style="list-style-type: none"> Provided an additional 100-yen discount for these users (600 yen lower than the ordinary monthly fee). For instance, Type I ordinary contract: 4,500 yen Contract longer than one year: 4,000 yen Contract longer than two years: 3,900 yen
	IDO	February 1999	Decreased its communications fee for a call from the cable TV system to an IDO terminal <ul style="list-style-type: none"> Communications fees for a 3-minute call from the cable TV to an IDO terminal during daytime on weekdays (a fixed rate, does not depend on distance) was revised from the previous 150 yen to 140 yen.
PHS	ASTEL Hokkaido	April 1998	Revised its charge systems for "Moji Talk" <ul style="list-style-type: none"> By hitting the special channel (1652), users can send a message to the Moji Talk Center Within 30 seconds: 10 yen (a fixed rate, depends on neither distance nor time zone) Longer than 30 seconds: the communications rates for PHS are applied
	DDI Pocket Group	June 1998	A decrease in communications charges for a call from a PHS terminal to an ASTEL PHS terminal whose network depends on the NTT network <ul style="list-style-type: none"> Set-up charges for a call was decreased from the previous 20 yen to 10 yen
	NTT Personal Group	September 1998	A decrease in communications charges for telemetering services <ul style="list-style-type: none"> Charges for telemetering services was decreased from the previous charges that were twice as much as the charges for its 32 kbps communications charges to the ordinary communications charges
	DDI Pocket Group, ASTEL Group, NTT Personal Group	Oct. 1998	A decrease in communications charges for a call from a PHS terminal to a cellular telephone and/or a car phone For instance, in case of DDI Pocket Group (a 3-minute rate, does not depend on distance) <ul style="list-style-type: none"> During daytime: decreased from the previous 180 yen to 150 yen Late-nights, early-mornings and in the evening, on Saturdays, on Sundays and on national holidays: decreased from the previous 180 yen to 90 yen
	DDI Pocket Group, ASTEL Tokyo, ASTEL Chugoku	Oct. 1998	A decrease in basic monthly charges for telemetering services For instance, in case of DDI Pocket Group <ul style="list-style-type: none"> Monthly charges: decreased from the previous 980 yen to 700 yen
	ASTEL Shikoku	Nov. 1998	
	ASTEL Kyushu	Jan. 1999	
	ASTEL Tokyo and ASTEL Chugoku	Oct. 1998	A decrease in communications charges for the "Day Talk Plan" For instance, in case of ASTEL Tokyo
	ASTEL Kansai	Nov. 1998	Eliminating the special fee for communications charges for the 32-kbps data communications and "Moji Talk" (the number is 1652) in the evening, late-nights and early morning (between 7 p.m. and 8 a.m.).
	ASTEL Kyushu	Jan. 1999	
ASTEL Chugoku	Feb. 1999		
ASTEL Okinawa	Mar. 1999		

Category	Carriers	Implementation of new services	Summary of change in call charges
ISDN	Hokkaido Telecommunications Network Co., Inc.	May 1998	A decrease in the basic monthly charges and communications charges <ul style="list-style-type: none"> • Basic monthly charges: decreased from the previous 9,500 yen to 4,600 yen • Communications charges: increased from 5-yen unit to 7-yen unit
	Chubu Telecommunications Co., Inc.	June 1998	A decrease in the basic monthly charges and communications charges within its own network <ul style="list-style-type: none"> • Basic monthly charges: decreased from the previous 8,500 yen to 4,600 yen • Communications charges within its own network For instance, a 3-minute call, within MA, during daytime <ul style="list-style-type: none"> • Decreased from 10 yen to 8 yen
	Tohoku Intelligent Telecommunications Co., Inc.	Sept. 1998	A decrease in the basic monthly charges and communications charges within its own network <ul style="list-style-type: none"> • Basic monthly charges: decreased from the previous 9,500 yen to 4,600 yen • Communications charges within its own network For instance, a 3-minute call, within MA, during daytime <ul style="list-style-type: none"> • Decreased from the previous 10 yen to 8 yen
	Hokuriku Telecommunications Network Co., Inc.	October 1998	A decrease in the basic monthly charges and communications charges within its own network <ul style="list-style-type: none"> • Basic monthly charges: decreased from the previous 9,500 yen to 4,600 yen • Communications charges within its own network For instance, a 3-minute call, within MA, during daytime <ul style="list-style-type: none"> • Decreased from the previous 10 yen to 9 yen
Cell relay	Japan Telecom	December 1998	A decrease in the basic monthly charges <ol style="list-style-type: none"> (1) Using high-speed digital leased circuits for access lines <ul style="list-style-type: none"> • 50 Mbps: decreased from the previous 324,000 yen to 192,000 yen (2) Using ATM leased circuits for access lines <ul style="list-style-type: none"> • Higher than 6 Mbps, up to 50 Mbps The additional fee for each Mbps exceeding 6 Mbps was decreased from the previous 6,000 yen to 3,000 yen
Frame relay	9 regional telecommunications carriers	December 1998	<ol style="list-style-type: none"> (1) A decrease in the communications charges for frame-relay logic circuits by linking regional group carriers <ul style="list-style-type: none"> • Longer than 750 km, 16 kbps: decreased from the previous 25,000 yen to 21,000 yen (2) A decrease in the communications charges for access lines <ul style="list-style-type: none"> • For instance, in case of Chubu Telecommunications Co., Inc. <ul style="list-style-type: none"> • 15 km, 64 kbps: decreased from the previous 43,000 yen to 40,000 yen

Note: 9 regional companies are as follows:
Hokkaido Telecommunications Network Co., Inc.
Tohoku Intelligent Telecommunications Co., Inc.
Tokyo Telecommunications Network Co., Inc.
Hokuriku Telecommunications Network Co., Inc.
Chubu Telecommunications Co., Inc.
Osaka Media Port Corp.
Chugoku Telecommunications Network Co., Inc.
Shikoku Information and Telecommunications Network Co., Inc.
Kyushu Telecommunications Network Co., Inc.

Appendix 30 Diversification in domestic telecommunications charges in fiscal 1998

Category	Carriers	Implementation of new services	Summary of change in call charges
Domestic telephone services	DDI	June 1998	Introduction of "VPN 20," a fixed-rate package plan for VPN <ul style="list-style-type: none"> • Users of the plan with the monthly rate of 18,000 yen can communicate up to 20 hours
	Japan Telecom	Aug. 1998	Introduction of "JNet 20," a fixed-rate package plan for VPN <ul style="list-style-type: none"> • Users of the plan with the monthly rate of 17,500 yen can communicate up to 20 hours
	NTT	November 1998	Expanded its "Time Plus Service," a discount service for calls within MA to nationwide <ul style="list-style-type: none"> • With a certain additional monthly payment, users can make a call within MA for five minutes during daytime or seven minutes late at night and early-mornings with the minimum charges of 10 yen. Introduction of "Tele Choice 30," a discount service on communications charges for certain long-distance telephone numbers <ul style="list-style-type: none"> • With an additional monthly payment, users can make a call to pre-registered long-distance numbers with a 30% discount.
	KDD	December 1998	Introduction of "KDD Wide Saver," a selective discount service <p>Without any additional monthly payment or any registration fee, users can get a discount when their monthly charges exceed certain amounts</p> <ul style="list-style-type: none"> • Between 10,000 yen and 50,000 yen: get a 15% discount • Between 50,000 yen and 500,000 yen: get a 20% discount • More than 500,000 yen: get a 25% discount
	DDI	January 1999	Introduction of "Danzen Hiruwari," a new selective discount service <ul style="list-style-type: none"> • With a certain additional monthly payment (200 yen per month), users can make a call during daytime on weekdays at the evening charges. In addition, users can get a 25% discount in communications charges for the top five destinations (in Japan) when communications charges for both domestic and international calls exceed a total of 1,000 yen.
Domestic leased circuits	NTT	April 1998	Introduction of new services called "Digital Access 1500," a short distance access product for its high-speed digital transmission services. <p>It is a simplified service that does not provide a disorder monitoring service by circuit</p> <p>For instance, up to 15 km</p> <ul style="list-style-type: none"> • Without any maintenance after office hours: 152,000 yen • Providing maintenance service 24-hours-a-day: 162,000 yen <p>For instance, up to 30 km</p> <ul style="list-style-type: none"> • Without any maintenance after office hours: 342,000 yen • Providing maintenance service 24-hours-a-day: 352,000 yen
		August 1998	Started providing a new high-speed digital services for mid-distance exceeding the prefectural border <p>It is a simplified service utilizing its short-distance access for access lines.</p> <p>Service menu: 64 kbps, 128 kbps, 1.5 Mbps</p> <p>Services prices: A variety of charges are provided depends on use (or non-use) of a double loop system for its trunk lines and the grade of maintenance.</p> <p>For instance, in case of 64 kbps, up to 40 km</p> <ul style="list-style-type: none"> • Without any double loop for its trunk line • Without any maintenance after office hours: 45,000 yen • With a double loop for its trunk line <p>Providing maintenance service 24-hours-a-day: 53,000 yen</p>
		December 1998	Introduction of new ATM leased circuit services <p>Users can freely choose a service menu and specified services, and choose services with different transmission speeds for the descend line and the ascend line.</p> <p>Service charges available in a large variety due to service menu, specified services, use of automated switching system in case of disorder and grade of maintenance menu.</p>

Continued on next page

Category	Carriers	Implementation of new services	Summary of change in call charges
Domestic leased circuit	NTT		For instance, in case of within 15 km <ul style="list-style-type: none"> • Use of automated switching system in case of disorder provide maintenance service 24-hours-a-day: 158,440 yen • Without an automated switching system in case of disorder Without any maintenance after office hours: 139,000 yen
	KDD	December 1998	Introduction of new selective discount services (discount service for users of both international and domestic circuits) <p>Users for both domestic leased circuits (high-speed digital transmission service from 64 kbps to 6 Mbps, and ordinary leased circuits (bandwidth services, coding services)) and international leased circuits (high-speed coding services from 56 kbps to 6 Mbps) will get the following discounts.</p> <ul style="list-style-type: none"> • International leased circuit (56 kbps to 384 kbps): 15 % • International leased circuit (384 kbps to 6 Mbps): 30 % • Domestic leased circuit: 5 %
Cellular and car phones	TU-KA Cellular Tokai	April 1998	Introduction of a new charging program including communications fees <p>For instance, in case of TU-KA Cellular Tokai (Free Talk Super)</p> <ul style="list-style-type: none"> • Basic monthly charge: 7,400 yen (including a 2,400-yen communications charges) <p>Communications charges: fixed rate of 20 yen per minute, 10 yen for a call completed within 10 seconds (a fixed rate depends neither on the date, time zone, nor distance)</p> <p>Notes: 1. Three companies of NTT DoCoMo Group in July 1998 introduced the system for 1.5 GHz users. 2. NTT DoCoMo Group in September 1998 introduced the system for 800 MHz users.</p>
	Digital TU-KA Chugoku	June 1998	
	Digital TU-KA Hokkaido	July 1998	
	Digital TU-KA Hokuriku		
	NTT DoCoMo Central	August 1998	
	NTT DoCoMo Tokai		
	NTT DoCoMo Kansai		
	Digital TU-KA Chugoku		
	Digital TU-KA Shikoku	September 1998	
	TU-KA Cellular Tokyo		
	TU-KA Phone Kansai	October 1998	
	NTT DoCoMo Group		
	Shikoku Cellular	November 1998	
	Digital TU-KA Kyushu		
TU-KA Cellular Tokai			
Digital TU-KA Chugoku	December 1998		
Digital TU-KA Shikoku			
Hokkaido Cellular, Tohoku Cellular, Hokuriku Cellular, Kansai Cellular, Kyushu Cellular, TU-KA Cellular Tokyo, Digital TU-KA Tohoku	Jan. 1999		
Chugoku Cellular, Okinawa Cellular, Kansai Digital Phone			
Digital TU-KA Kyushu			
TU-KA Cellular Tokai	April 1998	Introduction of a new charging program (fixed term contract for cellular phone and car phone) <p>For instance, in case of TU-KA Cellular Tokai</p> <p>When a user concludes a contract for one year, they get a 500-yen discount on their basic monthly charges. (If the contractor cancels the contract within the contract term, a 5,000-yen cancellation charge is imposed)</p> <ul style="list-style-type: none"> • Type I: 4,000 yen (ordinary contract is 4,500 yen) 	
Digital TU-KA Hokkaido, Digital TU-KA Hokuriku	June 1998		
Digital TU-KA Kyushu	Nov. 1998		
Digital TU-KA Chugoku, Digital TU-KA Shikoku	December 1998		
Digital TU-KA Tokai	April 1998	Introduction of a discount service for calls to preregistered telephone numbers <p>For instance, in case of TU-KA Cellular Tokai "Duet"</p> <p>With an additional monthly fee (300 yen per month), users get a 50% discount on communications charges when they make a call to preregistered one number for a TU-KA Cellular Tokai subscriber.</p>	
Digital TU-KA Chugoku, Digital TU-KA Shikoku	December 1998		
TU-KA Cellular Tokai	April 1998	Introduction of "Cyber Rate," a discount service for exclusive for data communications. <p>Provide a discounted charge for data communications.</p> <p>For instance,</p> <ul style="list-style-type: none"> • In case of "Free Talk Super": 10 yen per minute, fixed rate 	

Category	Carriers	Implementation of new services	Summary of change in call charges
Cellular and car phones	Tokyo Digital Phone Kansai Digital Phone TU-KA Phone Kansai	April 1998 May 1998 September 1998	Introduction of discount service for subscribers who use more than one line For instance, in case of Tokyo Digital Phone Provide a 50% discount on basic monthly fee for lines used by the same person and charged on the same bank account Note: the discount is provided for up to two subline users
	Tokyo Digital Phone Kansai Digital Phone Tokai Digital Phone	April 1998	Introduction of data communications charge plan When users transmit data using a communications equipment (such as a fax or a PC), they are provided lower communications charges than voice services applied areas: data communications between cellular phones and/or car phones within MA, and data communications from a cellular phone and/or car phone (except some cases) to subscriber's line within MA For instance, in case of Tokyo Digital Phone (Plan A): Charges: 12 yen per minute (a fixed rate depends neither on the date, time zone, nor distance)
	Tokai Digital Phone Tokyo Digital Phone	April 1998 July 1998	Introduction of a new charging program For instance, Tokyo Digital Phone "Talk Pack Gold" <ul style="list-style-type: none"> Basic monthly charges: 9,200 yen (including a 6,240-yen communications charge) Communications charges: 13 yen for 30 seconds (a fixed rate depends neither on the date, time zone, nor distance)
	Digital TU-KA Chugoku Digital TU-KA Shikoku	April 1998 May 1998	Introduction of "Giga Rate," a new charging program exclusive for data communications <ul style="list-style-type: none"> Charges: 12 yen per minute (standard plan, with the same rate applied nationwide)
	Digital TU-KA Tohoku	April 1998	Introduction of "Business Plan," a discount plan for heavy users <ul style="list-style-type: none"> Business 11: fixed rate 2,700 yen, discount rate 11% Business 20: fixed rate 4,500 yen, discount rate 15% for up to 400,000 yen, 20% for more than 400,000 yen
	Digital TU-KA Kyushu, Digital TU-KA Hokkaido, Digital TU-KA Hokuriku Digital TU-KA Chugoku, Digital TU-KA Tohoku, Digital TU-KA Shikoku TU-KA Group	April 1998 September 1998 Oct. 1998	Introduction of Moji message service For instance, Digital TU-KA Group <ul style="list-style-type: none"> Charges: 5 yen per message
	IDO	May 1998	Expansion of designated numbers for "Only You," a discount program for designated phone numbers With an additional monthly charge, users get a 50% discount on communications charges for a call to pre-registered numbers <ul style="list-style-type: none"> Number of designated numbers was increased from the previous one to three
	TU-KA Phone Kansai	June 1998	Introduction of a discount program for long-term users who subscribe to the service under a fixed term contract <ul style="list-style-type: none"> Provide 2% discount for users who subscribe to the service between one year and 3 years, 4% discount for users who subscribe to the service between three years and five years and 9% discount for users who subscribe five years or longer
	Digital TU-KA Chugoku	June 1998	Introduction of a new charging program "Super High Call Plan 'All 20' (Type 4)" <ul style="list-style-type: none"> The basic monthly charge: 6,500 yen The communications charge: 20 yen per minute
	Tokyo Digital Phone Kansai Digital Phone Tokai Digital Phone	June 1998 July 1998	Introduction of a called-party charging program When a Digital Phone user receives a call, the fee is charged on the called party rather than the caller For instance, in case of Tokyo Digital Phone <ul style="list-style-type: none"> Additional function fee: 1,000 yen per month

Category	Carriers	Implementation of new services	Summary of change in call charges
Cellular and car phones	IDO	June 1998	Interconnection with "MAL" and "DION," provided by DDI <ul style="list-style-type: none"> • Communications charges (standard type): 10 yen per minute (a fixed rate depends neither on the date, time zone, nor distance)
			Introduction of a nationwide abbreviated dialing system (# dialing) <p>Before, if an IDO subscriber wants to make a call with the system anywhere in Japan, the subscriber has to conclude a contract with both IDO and one of the DDI Cellular companies. Under this new program, a contact needs to be made with only one company (either IDO or a DDI Cellular company).</p> <ul style="list-style-type: none"> • Monthly basic charge: In the past: 28,000 yen x 2 After introduction of the new system: 28,000 yen
		July 1998	Interconnection with "Sirius" provided by Teleway <ul style="list-style-type: none"> • Charges (standard type): 10 yen per minute (a fixed rate depends neither on the date, time zone, nor distance)
	Digital TU-KA Tohoku	July 1998	Introduction of "Family Discount Pack," a discount service for family users <ul style="list-style-type: none"> • When a family use 2-4 lines, they receive a 20% discount on the monthly basic fees for the second to the fourth lines. In addition, they get a 5% discount on their communications charges for all of the lines.
	TU-KA Phone Kansai	October 1998	Introduction of a prepaid telephone service <p>When a user registers a "Pre-K card" with a face value of 3,000 yen, communications charges for 3,000 yen and a valid communications period of 30 days are input; then, this user can make a call of up to 30 minutes.</p> <ul style="list-style-type: none"> • Basic monthly charge: free • Communications charge: 50 yen for 30 seconds (a fixed rate depends neither on the date, time zone, nor distance)
	Digital TU-KA Hokkaido	October 1998	Introduction of "Kazoku-nandesu (We Are Family)," a discount service for family users. <p>When a family uses more than one line, they get a 20% discount on the basic monthly charge for the sublines; in addition, they get a 50% discount on communications fee for calls among family members.</p>
	NTT DoCoMo Group	December 1998	Introduction of "Family Discount," a discount program for subscribers who use more than one line. <p>When a family or an organization subscribes to 2-5 cellular or PHS lines, they get certain discounts on basic monthly fees (except packet communications services by cellular and/or car phones and telemetering service by PHS)</p> <ul style="list-style-type: none"> • Discount rates <ol style="list-style-type: none"> (1) Main line: 5% plus discount rate for long-term users (for only a cellular or a car phone) (2) Sublines: 15% (for a cellular phone, a car phone or a PHS) <p>Note: In case of a cellular phone or a car phone user, this service is limited to subscribers who are purchasing the whole day plan.</p>
TU-KA Phone Kansai	January 1999	Introduction of "Don-toku," a discount on basic monthly charges for long-term users. <p>With an additional payment for registration (1,500 yen), users are provided a certain discount according to the term for subscription. (When the subscriber cancels the subscription within one year, a 3,500-yen cancellation fee is charged.)</p> <ul style="list-style-type: none"> • Discount rate <p>Within one year: about 5% Between one year and three years: about 18% Between three years and five years: about 23% More than five years: about 28%</p> 	

Category	Carriers	Implementation of new services	Summary of change in call charges
Cellular and car phones	IDO	February 1999	Introduction of "Doccimo-Talk," a discount service for preregistered numbers With an additional payment for a registration fee, users are provided a certain discount for calls to preregistered NTT numbers (up to three phone numbers are available). • Basic monthly charges: 300 yen per one pre registered number • Discount rate A call from IDO: 25% discount A call received by IDO: about 25% discount
	Digital TU-KA Shikoku	February 1999	Introduction of "Birthday Talk," a discount for all subscribers on the subscriber's birthday. • When a subscriber make a call on the subscriber's birthday, then the communications fees are discounted by 50%.
PHS	DDI Pocket Group	April 1998	Introduction of a telemetering service (non-voice communications service between a monitoring device and an observation device) For instance, in case of DDI Pocket Group • Basic monthly charge: 980 yen per month • Communications charges: data communications charges are applied
	ASTEL Tokyo, ASTEL Chubu, ASTEL Kansai, ASTEL Chugoku, ASTEL Kyushu	May 1998	
	ASTEL Shikoku	June 1998	
	ASTEL Tohoku	Dec. 1998	
	NTT Personal Group	April 1998	Tentative interconnection with NTT's number directory service (104) • Charges for the number directory service: 120 yen per call (When the call is completed within 30 seconds, no charge is imposed; when NTT designates to exempt the caller from charging, no charge is imposed.)
	DDI Pocket Group	May 1998	
	DDI Pocket Group	April 1998	Introduction of a new service under which the called parties are limited For instance, in case of DDI Pocket Group • Basic monthly charge: 980 yen per month • Communications charge: the same as communications charges for ordinary DDI Pocket service
	ASTEL Kansai	Nov. 1998	
	ASTEL Chugoku	Dec. 1998	
	ASTEL Tokyo, ASTEL Chubu and ASTEL Kyushu	January 1999	
	DDI Pocket Group	April 1998	Introduction of a new charging plan (Plan B) • Basic monthly charge: 1,980 yen per month • Communications fee: doubled for calls in the evening, late-nights and early-mornings (except for data communications)
			Introduction of a discount program for long-term users Provides a certain discount on basic monthly charges for Plan A subscribers • Discount rate Longer than one year: 5% Longer than two years: 7% Longer than three years: 10%
			Introduction of discount program on the basic monthly charges for users who use more than one line • Provide a 200-yen discount on the basic monthly fees for multi-line subscribers who compile their bill into one (applied only to Plan A subscribers)
	ASTEL Chubu	April 1998	Introduction of "Moji Talk" When a user sends out a message from an apparatus which can send out push signals, then the message is at once stored at the message center; users can retrieve the message in text format from their own PHS terminals. • Basic monthly fee: 100 yen per month • Charge for sending out a text: When the message is sent out from an ordinary communications method (with the specified number of 1652), and when the message is completed within 30 seconds, the charge is 10 yen regardless of distance or time zone. • Charge for text storage: 5 yen per message
		Introduction of abbreviated dialing function (ASTEL quick dial) When a user call #0000 (four digits) from a PHS terminal, then they can get the call through to a subscriber of this service • Charges: 20,000 yen per number (within the service area of each ASTEL company) <i>Note: in other cases, charges are 30,000 yen per number per month.</i>	

Category	Carriers	Implementation of new services	Summary of change in call charges
PHS	NTT Personal Group	May 1998	Introduction of a discount program for long-term users (1) Provide certain discounts on their basic monthly fee for long-term subscribers (limited for subscribers for Plan 270) <ul style="list-style-type: none"> Discount rate Between six months and one year: 100 yen Between one year and three years: 200 yen Longer than three years: 300 yen (2) Provide discount on communications fees for long-term subscribers (limited for subscribers for Plan 198, Paldio Ohanashi Plus) <ul style="list-style-type: none"> Discount rate Between six months and one year: 5% Between one year and three years: 10% Longer than three years: 15% Note: The discount program for Paldio and Ohanashi Plus subscribers was introduced in September 1998
	ASTEL Hokkaido, ASTEL Tohoku, ASTEL Hokuriku, ASTEL Shikoku	May 1998	Introduction of "Tsunage-Taro," an interconnection services Data communications service with long-distance NCCs. It is a data communications service linking with an access point of Teleway (data on demand) and/or Japan Telecom (Inter Access 0088 and ODN) <ul style="list-style-type: none"> Communications charge: 13 yen per minute (depends neither on distance nor time zone)
	ASTEL Tokyo, ASTEL Kansai, ASTEL Chugoku	May 1998	Introduction of "Day Talk Plan," a selective charging plan It is a charging program which charges lower basic monthly charge and higher communications charges. <ul style="list-style-type: none"> Basic monthly charge: 1,980 yen per month Communications charge: doubled for calls in the evening, late-nights and early-mornings
	ASTEL Kyushu	June 1998	
	ASTEL Okinawa	July 1998	
	ASTEL Tokyo, ASTEL Chubu, ASTEL Kansai, ASTEL Chugoku, ASTEL Kyushu	May 1998	Introduction of a discount program for long-term users It is a service providing certain discounts for long-term users For instance, in case of ASTEL Tokyo, Chubu, Kyushu and Okinawa <ul style="list-style-type: none"> Discount rate Between one year and two years: 100 yen plus 5% for charges exceeding 2,000 yen Between two years and three years: 200 yen plus 7% for charges exceeding 2,000 yen Longer than three years: 300 yen plus 10% for charges exceeding 2,000 yen
	ASTEL Hokkaido	June 1998	
	ASTEL Okinawa	July 1998	
	ASTEL Tokyo, ASTEL Kansai, ASTEL Chugoku, ASTEL Kyushu	May 1998	Introduction of discount service for users who use more than one line When a subscriber uses more than one line under the same name and is charged to the same bank account, then the subscriber gets a certain discount on the basic monthly charges and communications fee or basic monthly charges For instance, in case of ASTEL Tokyo <ul style="list-style-type: none"> (1) For corporate users <ul style="list-style-type: none"> Basic monthly fee: 2,700 yen (subline users: 2,200 yen) Communications fee: calls between PHS under the same name 20% discount (2) Individual users <ul style="list-style-type: none"> Basic monthly charges: 2,700 yen (subline users: 1,700 yen) Communications fees: calls between PHS under the same name 20% discount
	ASTEL Hokkaido	June 1998	
	ASTEL Okinawa	Oct. 1998	
	ASTEL Chubu	February 1999	
NTT Personal Group	June 1998	Introduction of "Paldio Net Surfing," a WWW access service It is a service which a user get access to WWW on the Internet through OCN provided by NTT Corp. (no contract with provider is necessary). <ul style="list-style-type: none"> Charge: 15 yen per minute (a fixed rate depending neither on distance nor time zone) 	
ASTEL Hokkaido	June 1998	Introduction of "Thank You Plan," a selective charging plan With a certain additional fee (300 yen/month), users get a discount on communications fees between PHS terminals within Hokkaido For instance, <ul style="list-style-type: none"> The communications fee within MA: 9 yen for three minutes 	

Category	Carriers	Implementation of new services	Summary of change in call charges
PHS	ASTEL Chubu	June 1998	Introduction of "Waiwai Talk," a multi-party talk service It is a service letting up to four PHS subscribers talk to each other in the Chubu area <ul style="list-style-type: none"> The charge: 10 yen for the first 60 seconds (after that, 50 yen per 120 seconds)
	NTT Personal Group	September 1998	Introduction of a charging program including communications fees <ol style="list-style-type: none"> Paldio Ohanashi Plus <ul style="list-style-type: none"> Basic monthly charge: 1,980 yen (including a 1,000-yen communications charge) Communications fee: 2.5 times more than the ordinary fees Paldio Data Plus <ul style="list-style-type: none"> Basic monthly charge: 1,980 yen (including a 1,000-yen communications charge) Communications fee: <ul style="list-style-type: none"> For voice: 3 times more than the ordinary fee For data: same as the ordinary communications fee
	ASTEL Tokyo, ASTEL Chubu, ASTEL Kansai, ASTEL Shikoku, ASTEL Kyushu	September 1998	Introduction of a new charging plan for short calls Introduced a new charge plan for short calls between PHS terminals <ul style="list-style-type: none"> A call completes 10 seconds: 10 yen (a fixed rate depending neither on distance nor time zone) A call exceeding 10 seconds: same as the ordinary PHS communications fee
	ASTEL Hokkaido, ASTEL Chugoku, ASTEL Okinawa	October 1998	
	ASTEL Tohoku	Nov. 1998	
	ASTEL Hokuriku	Feb. 1999	
	DDI Pocket Group	Oct. 1998	Introduction of a new charging plan The plan provide lowers basic monthly charges and higher communications fees compared with the standard charging plan For instance, in case of DDI Pocket Group <ul style="list-style-type: none"> Basic monthly charge: 1,350 yen Communications fee: doubled compared with the standard plan for all of the day (except data communications, call to a cellular phone, short calls)
	ASTEL Tokyo	Jan. 1999	
	ASTEL Chugoku	Feb. 1999	
	ASTEL Okinawa	March 1999	
	DDI Pocket Group	October 1998	Expansion of discounts for long-term users and multiple-line users <ul style="list-style-type: none"> Target for these plans were expanded from the previous "users of the standard plan only" to all subscribers who meet the qualifications.
	ASTEL Chubu, ASTEL Shikoku	October 1998	Introduction of "5-yen call," a new selective communications plan With a certain additional payment (100 yen per month), users get a certain discount on communications charges for calls between PHS terminals in the area For instance: <ul style="list-style-type: none"> Charges for a call within service area: 5 yen per minute
	ASTEL Hokuriku	January 1999	
	ASTEL Kansai	Oct. 1998	Expansion of a discount program for multi-line users <ul style="list-style-type: none"> Provide a 20% discount on communications fees of all of the lines when a user subscribes to more than 200 lines
			Introduction of "Matteru," a service exclusive for receiving calls <ul style="list-style-type: none"> Basic monthly charge: free of charges
ASTEL Hokkaido	Nov. 1998	Introduction of "Pitch de Pitch" This program provides lower basic monthly charges and higher communications charges (lower charges for calls to PHS) <ul style="list-style-type: none"> Basic monthly charge: 1,880 yen Communications fee <ol style="list-style-type: none"> To PHS: a 10% discount from the standard program Others: same as the standard program or doubled 	
ASTEL Tokyo	Jan. 1999	Introduction of "Sanbiki," a discount services for communications charges With certain additional monthly charges, users get a 20% discount on communications charges for the top three destinations	
ASTEL Chugoku	February 1999		

Category	Carriers	Implementation of new services	Summary of change in call charges	
PHS	ASTEL Tokyo	January 1999	Introduction of 64 kbps data communications services using the center synthesis system Using two ASTEL terminals and 64 kbps adapters, users can send or receive data at a speed of 64 kbps. <ul style="list-style-type: none"> Communications fee: data communications charge plus 10 yen per minute 	
	DDI Pocket Group	Feb. 1999	Introduction of a new charging plan for specific purposes communications It is a charging plan for Moji Denwa <ul style="list-style-type: none"> Basic monthly fee (1) Plan A: basic monthly fee: 980 yen per month (2) Plan B: basic monthly fee: 1,780 yen per month (including a 1,000-yen communications fee) 	
ISDN	NTT	June 1998	Introduction of "INS Area Plus," a selective group charging plan <ul style="list-style-type: none"> With additional monthly fee of 350 yen per line, users can make a call to an adjacent MA or an area within a radius of 20 km with 10 yen for three minutes during daytime and for four minutes late-nights and early-mornings. 	
		Nov. 1998	Introduction of "INS Time Plus," a discount service for calls within MA With an additional monthly fee, users can make a call to a neighboring MA or an area within a radius of 20 km with 10 yen for three minutes during daytime and for four minute late-nights and early-mornings. Introduction of "INS Telechoice 30" With an additional monthly fee, users can get a 30% discount in communications fee for a long-distance call to one preregistered number.	
Frame relay	9 regional telecommunications carriers	December 1998	Introduction of an economy class For instance, in case of TNet <ul style="list-style-type: none"> 15 km, 1.5 Mbps: 190,000 yen 	
	NTT	March 1999	Introduction of a dial-up access service to frame relay from telephone network <ul style="list-style-type: none"> One logic port: 4,900 yen per month, 10 yen per minute 	
Internet	Teleway	July 1998	Revised the charge for β 2 for dial-up service for Sirius into a monthly fixed fee <ul style="list-style-type: none"> In the past: 1,850 yen basic monthly charges plus charges based on the amount of data After introduction of the new system: 1,850 yen per month 	
	DDI	October 1998	Introduction of an economy-class services Introduction of an economy-class which uses NTT's digital access lines for its access lines <ul style="list-style-type: none"> Charges: 64 kbps 15,000 yen per month, 128 kbps 24,000 yen per month 	
	Japan Telecom	October 1998	Introduction a new charge system depending on the amount of data for its ODN dial-up access service <ul style="list-style-type: none"> Charge: 10 yen per 42 seconds 	
	DDI	October 1998	Introduction of a new service category for its DION dial-up access service <ul style="list-style-type: none"> Charges: for four hours: 1,750 yen (10 yen for additional charges) For 20 hours: 7,000 yen (10 yen for additional charges) 	
	NTT	November 1998	Introduction of "OCN dial-up access long," a new charging plan for OCN dial-up access <ul style="list-style-type: none"> Monthly charge: 50 hours: 4,800 yen (5 yen for additional charges) 	
	KDD		December 1998	Introduction of an economy-class service for IP-routing leased circuit access <ul style="list-style-type: none"> 64 kbps: 12,000 yen per month
				Introduction of a new product for its dial-up service <ul style="list-style-type: none"> Basic monthly charge: 800 yen (up to five hours per month) Additional charges: 5 yen per minute (up to 3,000 yen)
	Shikoku Information Telecommunications Network	February 1999	Introduction of Type II computer communications service based on SDSL <ul style="list-style-type: none"> 192 kbps: 78,000 yen 	
Japan Telecom	February 1999	Introduction of a new service which users can get access during the specified time zone Introduced a new service menu that users can get access to ODN during the specific time zone (5:00 and 20:00) <ul style="list-style-type: none"> Charge: 1,300 yen per month 		

Note: nine regional companies are as follows:

Hokkaido Telecommunications Network Co., Inc., Tohoku Intelligent Telecommunications Co., Inc., Tokyo Telecommunications Network Co., Inc., Hokuriku Telecommunications Network Co., Inc., Chubu Telecommunications Co., Inc., Osaka Media Port Corp., Chugoku Telecommunications Network Co., Inc., Shikoku Information and Telecommunications Network Co., Inc., Kyushu Telecommunications Network Co., Inc.

Appendix 31 Changes in Corporate Service Price Indexes (CSPI) (international telecommunications services)

(100 = Average CSPI for 1990)

Service	Quarter	Average CSPI for 1990	1991-I	1991-II	1991-III	1991-IV	1992-I	1992-II	1992-III	1992-IV	1993-I	1993-II
All corporate services		100.0	101.6	102.9	103.6	103.7	103.9	105.0	105.0	105.0	104.9	105.4
All international telecommunications services		100.0	97.3	95.5	95.5	95.4	95.3	95.3	95.3	95.3	95.3	95.3
International telephone services		100.0	96.7	94.6	94.6	94.6	94.6	94.6	94.6	94.6	94.6	94.6
International leased circuit services		100.0	100.0	100.0	100.0	98.3	97.4	97.4	97.4	97.4	97.4	97.4
International telex services		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Service	Quarter	1993-III	1993-IV	1994-I	1994-II	1994-III	1994-IV	1995-I	1995-II	1995-III	1995-IV	1996-I
All corporate services		105.1	104.6	104.6	104.3	103.7	103.3	103.1	103.0	102.8	102.4	102.2
All international telecommunications services		95.3	93.9	93.9	93.9	93.9	92.6	90.0	89.9	89.9	86.8	84.9
International telephone services		94.6	93.0	93.0	93.0	93.0	91.7	89.1	89.1	89.1	85.4	83.2
International leased circuit services		97.4	97.4	97.4	97.4	97.4	95.1	89.7	88.1	87.5	87.5	87.5
International telex services		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Service	Quarter	1996-II	1996-III	1996-IV	1997-I	1997-II	1997-III	1997-IV	1998-I	1998-II	1998-III	1998-IV
All corporate services		102.2	102.0	101.8	101.9	103.6	103.6	103.4	103.6	103.4	103.0	102.5
All international telecommunications services		84.9	84.9	82.6	81.2	81.2	81.2	81.2	81.2	81.2	81.2	74.4
International telephone services		83.2	83.2	80.5	78.9	78.9	78.9	78.9	78.9	78.9	78.9	70.7
International leased circuit services		87.5	87.5	87.5	87.5	87.5	87.5	87.5	87.5	87.5	87.5	87.5
International telex services		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: I, II, III and IV in this table indicate the quarter of each calendar year.

Source: "Monthly Report on the Wholesale Price Indexes," the Bank of Japan

Appendix 32 Outline of major changes in communications service charges in fiscal 1998 (international telecommunications services)

Service	Carrier	Implementation	Revisions
International telephone	WorldCom Japan	October 1998	Launch of international telephone service [e.g., Charges for a three-minute, daytime, weekday call destined for the U.S., China, the Republic of Korea and the U.K.] To the U.S.: 248 yen To China: 464 yen To Korea: 448 yen To the U.K.: 424 yen
	DDI	October 1998	Launch of international telephone service [e.g., Charges for a three-minute, daytime, weekday call destined for the U.S., China, the Republic of Korea and the U.K.] To the U.S.: 240 yen To China: 480 yen To Korea: 360 yen To the U.K.: 420 yen
	Japan Telecom	December 1998	Reduction of international telephone charges [e.g., Charges for a three-minute, daytime, weekday call destined for the U.S., China, the Republic of Korea and the U.K.] To the U.S.: 440 yen → 240 yen To China: 620 yen → 600 yen To Korea: 550 yen → 470 yen To the U.K.: 760 yen → 550 yen
	WorldCom Japan	December 1998	Reduction of international telephone charges [e.g., Charges for a three-minute, daytime, weekday call destined for the U.S., the Republic of Korea and the U.K.] To the U.S.: 248 yen → 150 yen To Korea: 448 yen → 315 yen To the U.K.: 424 yen → 165 yen
	IDC	December 1998	Reduction of international telephone charges [e.g., Charges for a three-minute, daytime, weekday call destined for the U.S., China, the Republic of Korea and the U.K.] To the U.S.: 440 yen → 240 yen To China: 620 yen → 600 yen To Korea: 550 yen → 470 yen To the U.K.: 760 yen → 550 yen
	KDD	December 1998	Reduction of international telephone charges [e.g., Charges for a three-minute, daytime, weekday call destined for the U.S., China, the Republic of Korea and the U.K.] To the U.S.: 450 yen → 240 yen To China: 630 yen → 600 yen To Korea: 560 yen → 470 yen To the U.K.: 770 yen → 550 yen
	DDI	January 1999	Reduction of international telephone charges [e.g., Charges for a three-minute, daytime, weekday call destined for the U.S., China, the Republic of Korea and the U.K.] To the U.S.: 240 yen → 168 yen To China: 480 yen → 420 yen To Korea: 360 yen → 330 yen To the U.K.: 420 yen → 405 yen
	Japan Telecom	January 1999	Reduction of international telephone charges [e.g., Charges for a three-minute, daytime, weekday call destined for China, the Republic of Korea and the U.K.] To China: 600 yen → 590 yen To Korea: 470 yen → 450 yen To the U.K.: 550 yen → 540 yen
	IDC	February 1999	Reduction of international telephone charges [e.g., Charges for a three-minute, daytime, weekday call destined for China, the Republic of Korea and the U.K.] To China: 600 yen → 590 yen To Korea: 470 yen → 450 yen To the U.K.: 550 yen → 540 yen
International leased circuit	NTT Worldwide Telecommunications	October 1998	Launch of international leased circuit service [e.g., Charges for a 1.5-Mbps leased circuit destined for the U.S. and the U.K.] To the U.S. (one way per month): 3,970,000 yen To the U.K. (one way per month): 5,760,000 yen
	WorldCom Japan	November 1998	Launch of international leased circuit service [e.g., Charges for a 1.5-Mbps leased circuit destined for the U.S. and the U.K.] To the U.S. (one way per month): 3,573,000 yen To the U.K. (one way per month): 4,500,000 yen

Appendix 33 Outline of the “Census of Information Flow”

1. Objectives

The “Census of Information Flow” has been conducted to measure the amount of information distributed by each media through use of sets of common standards, and thereby fathom, by chronological order, the status of information flow both quantitatively and comprehensively. Regional census has also been carried out to measure the amount of information flow by region.

2. Target media

The latest census was conducted on a total of 81 media. These media, by their nature, fall into the three groups of telecommunications, physical distribution and activities away from home. In general, these media can also be categorized as either personal or mass media.

Media group	Name of medium	
Telecommunications	1 Subscriber telephone	
	2 Car/Cellular telephone	
	3 PHS	
	4 Train/Ship telephone	
	5 Radio paging	
	6 Subscriber line facsimile	
	7 TV programming supply to terrestrial TV broadcasters	
	8 TV programming supply to cable TV operators	
	9 Radio programming supply to terrestrial radio stations	
	10 Electronic transmission of newspaper articles	
	11 Leased circuit service (telephone)	
	12 Leased circuit service (facsimile)	
	13 Leased circuit service (data transmission)	
	14 Leased circuit service (pictures, image transmission)	
	15 Satellite communications	
	16 Digital data transmission service	
	17 TV conferencing	
	18 Videotex	
	19 Facsimile service through facsimile communications networks	
	20 ISDN (telephone)	
	21 ISDN (facsimile)	
	22 ISDN (data transmission)	
	23 ISDN (pictures, image transmission)	
	24 Telegraph	
	25 Telex	
	26 Premises telephone (premises communications)	
	27 Premises radiocommunications (premises communications)	
	28 LAN	
	29 Personal radio	
	30 Wire broadcast telephone	
	31 Off-talk communications	
	32 MCA radio	
	33 Convenience radio phone	
	34 Teleterminal	
	35 AVM	
	36 Personal communications	
	37 Database	
	38 Internet	
	Mass media	39 Terrestrial TV broadcasting
		40 Cable TV broadcasting
		41 BS TV broadcasting
		42 CS analog TV broadcasting
		43 CS digital TV broadcasting
		44 High-definition TV broadcasting
		45 Satellite data broadcasting
		46 AM radio broadcasting
		47 FM radio broadcasting
		48 Cable sound broadcasting
		50 Character broadcasting
		51 FM teletext multiplex broadcasting
		52 Premises broadcasting

Media group		Name of medium	
Physical distribution	Personal media	53	Letter
		54	Postcard
		55	Electronic mail item
		56	Handwritten document
		57	Document written with wordprocessor
		58	Document written with computer
		59	Document written with personal computer
		60	Copy of document
	Mass media	61	Newspaper
		62	Magazine
		63	Book
		64	Other printed matter
		65	CD-ROM
		66	Video software
67		Audio software	
Activities away from home	Mass media	68	DVD software
		69	Computer software
		70	Personal computer software
		71	Library
	Personal media	72	Video software (rental)
		73	Audio software (rental)
		74	Electronic display
		75	Lecture/play/concert
		76	Watching sports games
		77	Film screening
78	School education		
79	Societal learning		
80	Conference		
81	Conversation		

3. Amount of information flow

The census measures the amount of information flow by the five types shown in the table below.

Type	Definition
Amount of information supplied	Total amount of information other than copies and retransmissions distributed by all media
Amount of information transmitted	Total amount of information distributed per year by all media, including copies and retransmissions
Amount of selectable information	Total amount of information provided to consumers in selectable forms
Amount of consumable information	Of the "consumable information," total of amounts of information each media provides to consumers (see Note)
Amount of information consumed	Of total amount of "information transmitted," the amount of information received and consumed by consumers per year.

Note: The word "consumable" in the term of the "amount of consumable information" refers to the amount of information each media provides for consumers in consumable forms.

4. Amount of information stock

To grasp precisely how far informatization has been promoted, not only fathoming of information flow in general, but also other decisive methods have to be used. This is the reason why the “Census of Information Flow” measures the amount of information stock to estimate the total amount of information in existence in the society as a whole. Definitions of the amount of information stock are shown in the table below.

Type	Definition
Amount of information stock	Of information actually distributed through various media, total amount of information stored per year by information distributors and/or receivers for the purposes of archiving or replaying in the future
Amount of information stock at the information distributor level	Of the “amount of information stock,” the total amount of information stored by information distributors
Amount of information stock at the information receiver level	Of the “amount of information stock,” the total amount of information stored by information receivers

5. Measurement concepts

Measurement concepts applied for the three media groups regarding the amount of information flow and of information stock are shown in the table below.

[Regarding the amount of information flow]

Type	Telecommunications	Physical distribution	Activities away from home
Amount of information supplied	Amount of information conveyed by callers over the telephone as well as amount of original broadcast programming	Total amount of information carried in original mail items and books as well as in the original copy of CDs and video software	Total amount of information conveyed by speakers in conversations, as well as by the first screening of movies, or the first performance of plays
Amount of information transmitted	About the same volume as the amount of “information supplied” as regards personal media, such as telephone and mail items		
	Total amount for all programs aired by all broadcasters	Total amount of information distributed in multiple copies of books, CDs and video software	Total amount of information conveyed by speakers in conversations, as well as total amount of information conveyed through movie screening and performance of plays per year
Amount of selectable information	About the same volume as the amount of “information transmitted” as regards personal media, such as telephone and mail items		
	Total amount for broadcast programs provided to consumers nationwide in selectable forms through their receiving equipment	Total amount of information distributed in multiple copies of books, CDs and video software	Total amount of information dispatched to listeners in conversations, as well as the total amount of information dispatched towards seats in theaters and movie theaters
Amount of consumable information	About the same volume as the amount of “information transmitted” as regards personal media, such as telephone and mail items		
	Total amount for broadcast programs that can be consumed through receiving equipment installed nationwide	Total amount of information distributed in multiple copies of books, CDs and video software	Total amount of information dispatched to listeners in conversations, as well as the total amount of information dispatched towards seats in theaters and movie theaters
Amount of information consumed	Total amount of information that information receivers, such as called parties and TV viewers, actually consumed.	Total of information amounts consumed by each individual, by reading books, listening CDs and watching video software.	Total of amounts of information that listeners in conversations and people watching movies or plays in theaters actually consumed

[Regarding the amount of information stock]

	Mass media	Personal media
Amount of information stock at the information distributor level	Storing for re-use by business and public sectors (e.g., library books, rental video stores and TV programs owned by broadcasters)	Information stored by information distributors (e.g., faxed documents, original documents to be handed to receivers, original speech drafts)
Amount of information stock at the information receiver level	Storing at households (e.g., books, taped TV programs and CDs)	Information stored by information receivers (e.g., received fax documents, documents handed, received mail items)

6. Conversion of information amounts in various units to the single unit: Japanese words

In the "Census of Information Flow," the amounts of information distributed through different media are measured by a single unit, which enables quantitative comparison of the information amount of each media to the entire information amount. Specifically, information in different formats, such as texts and video, are measured in the unit of Japanese "words" (equivalent to clauses).

Taking into consideration the differences in the amount of information that each media can carry, conversion formulas were decided upon for various types of media based on results of experiments involving a lot of actual measurements. The conversion ratios that enable comparison of information amounts in words are shown in the table below.

	Format		Measurement unit	Conversion ratio	
Sign information	Written language	Sentences in "kana" (Japanese phonetic signs)	Character	0.220	
		Sentences in kana and Chinese characters	Character	0.300	
	Spoken language		Minute	71	
Pattern information	Music		Minute	120	
	Still image	Black and white	Page	80	
		Color	Page	120	
	Video	Color	Direct viewing	Minute	1,200
			TV	Minute	672
			High-definition TV	Minute	1,032
			Movie	Minute	1,032

Appendix 34 Fiscal 1999 info-communications projects to which NTT-C' loans applied

	Project	Project sites
Projects Conducted within Designated Teletopia Communities	<ul style="list-style-type: none"> • Videotex Facilities Construction Project Regional Communications Facilities Construction Project (including Comprehensive Regional Digital Communications Facilities Construction Project) • Cable TV Facilities for Data Transmission and Broadcasting Construction Project Regional Shared-Use Wireless Network Facilities Construction Project (including Construction of Community Broadcasting Facilities) • Broadcast Programming Promotion Center Facilities Construction Project (including Project for Promoting Usage of Broadcast Programming Materials and Project for Construction of Broadcast Programming Production Facilities that Control Receiving Facilities) 	Within Designated Teletopia Communities only
Facilities Construction Projects based on the Private Participation Promotion Law ★	<ul style="list-style-type: none"> • Telecom Research Park • Telecom Plaza (including Project for the Construction of Video Software Exchange Promotion Facilities) • Teleport and Intelligent Building (IB) Construction Project • Specified Telecommunications Infrastructure Facilities and IB Construction Project 	No specific conditions
Projects for Telecommunications Infrastructure Enhancement	<ul style="list-style-type: none"> • Advanced Communications Facilities Construction Project • Advanced Cable TV Broadcasting Facilities Construction Project • Project for Construction of Facilities that Enhance Reliability • Staff Training Project 	No specific conditions
Advanced TV Broadcasting Facilities Construction Project (Note 2)		No specific conditions
Project for Promotion of Telecommunications Facilities Advancement in Main Cities and Adjoining Areas in Local Communities		Within main cities and adjoining areas designated in Main City Law's approved plan
Specified R&D Base Facilities Construction Project		No specific conditions
Cable TV Broadcast Programming Enhancement Project		No specific conditions
Project for Construction of Telecommunications Facilities in Central City Districts		(Note 3)
Project for Construction of Core Facilities in Osaka Bay Area ★		Within Osaka Bay area development sites designated under the Osaka Bay Area Law's approved plan

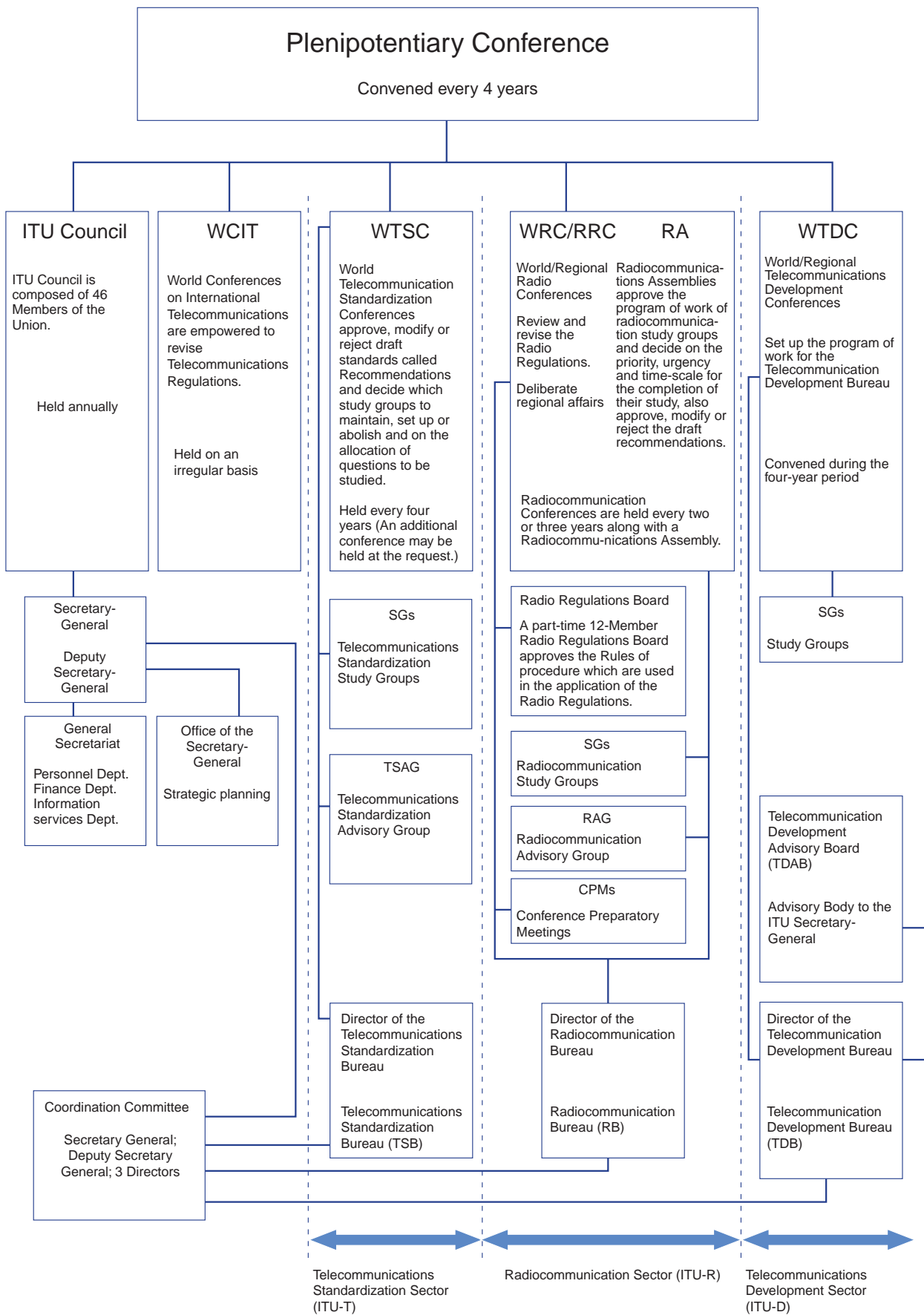
Notes: 1. shaded portion indicates a project to which NTT-C' loans were made applicable or a project expanded in its scope for fiscal 1999.

2. This project excludes broadcasters providing services in the Kanto or Kinki region and adjoining areas.

3. "Central city districts" here refer to those designated in municipalities' basic plans in accordance with the "Law for Comprehensively Promoting Revitalization of Central City Districts and Economy."

Expenses applicable	Loan ratios and other conditions		Loan conditions
Construction costs (excluding costs for land purchasing, land preparation and operations)	Distinction	Loan ratio	[Loan period] Within 15 years [Term of deferment] Within 3 years [Repayment method] Upon passing of the term of deferment, repayment of the principal in the same amount of installments [Applied interest rate] Three-fourths of the interest rates on conventional loans, or the same rate as for the Fiscal Investment and Loan Program
	City districts designated in the Law for the Development of Tokyo Metropolitan Area, city districts designated in the Law for the Development of Kinki Area and old city districts in Nagoya City	Up to 25%	
	Suburban development areas designated in the Law for the Development of Tokyo Metropolitan Area, those designated in the Law for the Development of Kinki Area, and urban development areas designated in the Law for the Development of Chubu Area (excluding old city districts in Nagoya City)	Up to 37.5%	
	Other areas	Up to 50%	
<p>★ Concerning the Facilities Construction Projects based on the Private Participation Promotion Law as well as Project for Construction of Core Facilities in Osaka Bay Area, loan ratios were increased (from 25% or 37.5% to 50%) for those municipalities designated as “disaster-stricken special municipalities” according to Article 2-1 of the Special Financial Aids and Subsidies Law for the Great Hanshin-Awaji Earthquake Victims and Damages; the increased loan ratios were applicable only to projects approved in the fiscal 1995 to 1999 development plans.</p> <p>[Conditions for construction of additional facilities]</p> <ol style="list-style-type: none"> 1. Construction of additional facilities must be included in construction plan of main facilities. 2. Additional facilities must be an integral part of the entire facilities, with their functions being closely related with main facilities. 3. Construction costs for additional facilities should be up to about 70% of construction costs for main facilities (when additional facilities share the same building with the main facilities, construction costs are allowed to be about the same as those for main facilities). 4. Additional facilities and main facilities must be constructed by the same info-communications service provider. 			

Appendix 35 Structure of International Telecommunication Union (ITU) (as of end of fiscal 1998)



Appendix 36 Project to construct transmission towers for mobile communications (fiscal 1991 to 1998)

1. Facilities in sparsely populated and rural areas

Fiscal	1991	1992	1993	1994	1995	1996	1997	1998	
Prefecture	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality	Municipality	
Hokkaido	Mitsuishi Town Okoppe Town Tokoro Town	Hidaka Town	Takinoue Town	Nakagawa Town	Suttsu Town	Shimokawa Town Rikubetsu Town	Okushiri Town Kuromatsunai Town Esan Town Toi Town	Horokanai Town Todohokke Village Urakawa Town Makubetsu Town Maruseppu Town Syakotan Town	Akaigawa Village Nishiokoppe Village Hiroo Town Makubetsu Town Syakotan Town
Aomori	Kazamura Village		Ajigasawa Town			Fukaura Town	Kanita Town	Kodomari Village Fukaura Town	
Iwate	Koromogawa Village Yamagata Village			Murone Town				Yuda Town (2) Taro Town Yamagata Village Kawai Village	
Miyagi			Naruko Town					Sichikasyuku Town Naruko Town	
Akita								Higashi-naruse Village Oga City	
Yamagata							Nishiyama Town	Mogami Town Obanazawa City (2)	
Fukushima			Nishiaizu Town	Tenei Village	Kitashiobara Village		Furudono Town	litate Village Kitashiobara Village Tajima Town	
Ibaraki	Satomi Village	Gozenyama Village	Ogawa Village			Miwa Village	Suifu Village		
Gunma		Onogami Village		Katashina Village	Tone Village		Kurabuchi Village Nanmoku Village	Onishi Town	
Saitama							Otaki Village		
Tokyo		Hinohara Village					Okutama Town		
Niigata	Uragawara Village	Matsunoyama Town	Oguni Town	Aikawa Town Tsugawa Town		Matsudai Town	Oshima Village	Yamakoshi Village	
Toyama		Yamada Village			Taira Village		Toga Village	Kamitaira Village Himi City (7)	
Ishikawa				Yanagida Village		Torigoe Village		Shiramine Village Hakui City Anamizu Town Monzen Town Suzu City	
Fukui		Miyazaki Village	Miyama Town			Echizen Town	Natasho Village	Ikeda Town Miyama Town (3)	
Nagano							Shiga Village		
Gifu		Kashimo Village			Kamioka Town	Higashi-shirakawa Village	Shokawa Village Kushihara Village Itadori Village Fujihashi Village	Sakauchi Village Kaminoho Village Kawai Village Kuze Village Kasuga Village	Yaotsu Town Kiyomi Village Kuzue Village
Shizuoka	Tatsuyama Village		Minamizu Town			Haruno Town Sakuma Town	Misakubo Town Honkawane Town	Inasa Town Honkawane Town	
Aichi	Touei Town	Obara Village					Inabu Town		
Mie		Miyagawa Village		Nansei Town		Omiya Town Kisei Town	Kiwa Town Ouchiyama Village		
Shiga	Nishiazai Town	Kutsuki Village							
Kyoto			Keihoku Town		Kumihama Town	Miyama Town		Sonobe Town Keihoku Town (2)	
Hyogo	Haga Town	Okawachi Town Chikusa Town						Yasutomi Town	
Nara							Soni Village Shimokitayama Village	Murou Village Yoshino Town	
Wakayama				Koya Town				Kanaya Town Oto Village (2) Miyama Village (2)	
Tottori							Wakasa Town	Nichinan Town Saji Village	
Shimane				Iwami Town			Sada Town Mizuho Town Yokota Town	Nita Town Kakinoki Village Yoshida Village	
Hiroshima	Fukutomi Town				Oasa Town	Joge Town		Kimita Village	
Yamaguchi	Hongo Village	Abu Town	Kuka Town	Mito Town		Nishiki Town		Toyota Town (2) Susa Town Nishiki Town	
Tokushima		Wajiki Town		Yamashiro Town	Kamiyama Town	Katsuura Town	Kamikatsu Town Higashi-iyayama Village	Kaminaka Town (4) Koyadaira Village Handa Town (2) Kainan Town Yamashiro Town Aioi Town Higashi-iyayama Village Kisawa Village (2) Kito Village Ichiu Village (3)	
Kagawa	Kotonami Town								
Kochi					Agawa Village	Nakatosa Town	Kahoku Town	Higashitsuno Village	
Nagasaki		Arikawa Town			Emukae Town		Izuhara Town Mitsushima Town Naru Town	Ojika Town Narao Town Uku Town	
Kumamoto					Reihoku Town	Oguni Town	Kawaura Town		
Oita	Notsuharu Town	Kuju Town							
Miyazaki				Aya Town	Kitaura Town		Togo Town Kitakata Town Suki Village	Saigo Village Nichinan City Nango Village Kitaura Town Togo Town	
Kagoshima		Kirishima Town							
Okinawa					Hirara City Ishigaki City		Tarama Village Tokashiki Village Zamami Village		
Prefecture	13	17	10	12	13	15	25	26	
Municipality	16	18	10	13	14	18	44	104	
								Total	237

Note: For municipalities where more than one project was carried out during each fiscal year, figures in parentheses indicate number of projects.

2. Radio facilities inside highway tunnels and underground radio facilities

Region/Prefecture	1993	1994	1995	1996	1997	1998
Hokkaido					Sapporo North Exit Underground Parking Lot	
Tohoku						Sendai Underground Pathway
Kanto		Shutoko Line Tamagawa Tunnel Shutoko Line Kawasaki Tunnel	Tokyo Gaikan Line Wako Tunnel		Sasago Tunnel	Yokohama Underground Shopping Mall
			Tomei Line Tsuburano Tunnel		Kawasaki Underground Shopping Mall	Kanetsu Tunnel
			Shinjuku-gyoen Tunnel			Fuchijiri Tunnel
						Nagaizaka Tunnel
						Asamayama Tunnel
						Iriyama Tunnel
						Hanasaka Tunnel
						Namiki Tunnel
						Nagahama Tunnel
Shinetsu					Nishibori Rosa Underground Shopping Mall	
Hokuriku						
Tokai			Tomei Line Nihonzaka Tunnel	Tomei Line Seikenji Tunnel	Sinnihonzaka Tunnel	Marukowarasina Tunnel
				Nagoya-ekimae Underground Shopping Mall		Nagoya Subway Station
Kinki	Nishiumeda Bus Stop *		Meishin Line Tennozan Tunnel	Nagara Tunnel	Maiko Tunnel	Kyoto Station Underground Shopping Mall
			Meishin Line Kajiwara Tunnel	Hanna Tunnel		
			Osaka-ekimae Diamond Underground Shopping Mall *	Nagahori Underground Shopping Mall		
				Nishi-umeda Underground Pathway		
Chugoku			Sanyo Line Tenjinyama Tunnel	Sanyo Line Ohirayama Tunnel	Sanyo Line Shiwa Tunnel	Nakoshiyama Tunnel
			Sanyo Line Takedayama Tunnel, Sanyo Line Aki Tunnel		Sanyo Line Saijo Tunnel	Tsutsumiyama Tunnel
					Okayama Underground Shopping Mall	
Shikoku						
Kyusyu				Tenjin Underground Shopping Mall	Sashiki Tunnel	Kongosan Tunnel
					Hakata Underground Shopping Mall	Fukuchiyama Tunnel
						Kanmon National Motorway Tunnel
						Takeoka Tunnel
						Nakasukawabata Subway Station
				Fukuoka City Subway Station		
Okinawa						
	1	2	10	8	10	34

Accumulated number

65

Note: * indicates projects promoted by municipality.

Appendix 38 Sites of projects to eliminate poor reception of commercial AM radio broadcasting (as of end of fiscal 1998)

Prefecture	Municipality
Hokkaido	Engaru Town
	Enbetsu Town
Iwate	Iwaizumi Town
Akita	Honjo City
Yamagata	Oguni Town
Niigata	Koide Town
	Sumon Village
	Hirokami Village
	Yunotani Village Horinouchi Town
Fukui	Tsuruga City
Shizuoka	Misakubo Town
	Tatsuyama Village

Prefecture	Municipality
Shizuoka	Haruno Town
	Sakuma Town
	Tenryu City
Wakayama	Hikigawa Town Susami Town
Shimane	Ota City
Yamaguchi	Susa Town
Kagawa	Shirotori Town
	Ochi Town Hiketa Town
Kochi	Tosashimizu City Susaki City
Saga	Arita Town

Prefecture	Municipality
Kumamoto	Soyo Town (2)
	Seiwa Village
	Oguni Town
	Minamioguni Town
	Kawaura Town
Oita	Saiki City
	Yuhuin Town
	Taketa City
Kagoshima	Naze City

- Notes: 1. Figures in parentheses indicate number of projects in accumulation.
2. * indicates the municipalities where projects took place during fiscal 1998.

Appendix 39 Sites of projects to eliminate poor reception in urban centers (as of end of fiscal 1998)

Prefecture	Municipality
Tokyo Metropolis	Nakano-City (4)
	Adachi-City * (3)

- Notes: 1. Figures in parentheses indicate number of projects in accumulation.
2. * indicates the municipalities where projects took place during fiscal 1998.

Appendix 40 Number of households benefiting from projects to improve broadcast reception (as of end of fiscal 1998)

Project name	Accumulative number of households
Project for eliminating poor reception areas of commercial terrestrial TV broadcasting	127,656
Project for eliminating poor reception areas of commercial AM radio broadcasting	224,788
Project for eliminating poor reception areas in urban centers	Some 150,000
Project for supporting construction of satellite broadcasting receiving facilities	19,514

Appendix 41 Application of loan systems of the Development Bank of Japan and other financial institutions to info-communications projects for fiscal 1999

	Large	Medium	Small	Project		Government-set interest rate and loan ratio (?)	Note
	Japan Development Bank/North East Finance of Japan	Realization of affluent lifestyle	Info-communications network		1. Promotion of secured and advanced telecommunications network development 1) Communications system development project for Type I telecommunications services 2) Satellite communications, broadcasting and controlling systems development project (Note 1) 3) Communications system development project for Type II telecommunications services 4) Project for promoting advancements and security in telecommunications facilities 5) Project for promoting effective use of frequency resources 6) Project for ensuring equal access to info-communications networks		III (??), 40% III, 40% II, 40% I, 40% II, 30% I, 40%
2. Promotion of advanced broadcasting usage 1) Project for promoting digitalization of broadcasting • Project for development of terrestrial digital broadcasting facilities and the program production environment • Project for construction of facilities for frequency transfer 2) Project for the development of broadcast program production facilities for the mute and the visually-impaired					III, 40% II, 40% II, 40%		
3. Promotion of further advanced informatization Development of communications systems and systems for electronic commerce information					III, 40%		
Creation of self-reliant communities		Regional social infrastructure development	Creation of regional centers	4. Revitalization of central city districts Of projects for the development of telecommunications systems in central city districts, those carried out by third-sector corporations		II, 50% III, 50%	4
			Regional social infrastructure	5. <u>Facilities designated by the Private Participation Promotion Law</u>		II, 50%	
		6. <u>Social infrastructure development utilizing private funds</u>		III, 50%	5, 6		
		7. Regional informatization 1) Cable TV broadcasting system development project 2) Broadcasting facilities development project (community broadcasting, broadcasting in foreign languages) 3) Projects within designated Teletopia & Newmedia Communities		II, 40% I, 40% II, 40%	3, 4		
		Regional collaboration/Support for self-reliant regions		8. Solving of the concentration of administrative functions		II, 40%	
Creation of economic vitality		Intellectual infrastructure development	Development of new technologies	9. <u>Development of new technologies (Note 1)</u> • Project for the development of research facilities for basic and applied research fields • Development project for commercial use of new technologies • Project for commercial use of new technologies		III, 50% III, 50% III, 50%	7.9 7.9
			Incubation of new businesses	10. Incubation of new businesses 1) <u>Incubation of new businesses</u> 2) Creation of technology-oriented corporate entities		II, 50% II, 40%	8.9
Export-Import Bank of Japan	(Import of products) (Import of products) (General investment) (General investment) (General investment)			11. Promotion of international cooperation and harmonization in the telecommunications sector 1) Promoting import of communications and broadcasting satellites 2) Promoting import of communications devices 3) Promoting business deployment overseas by international telecommunications carriers (e.g., submarine cable laying) 4) Promoting international TV broadcasting services overseas 5) Support for telecommunications infrastructure development overseas		Fiscal Investment and Loan Program Interest rate - α , 70% - α , 70% $\pm \alpha$, 80% $\pm \alpha$, 80% $\pm \alpha$, 80%	10

- Notes:**
- The North East Finance of Japan (NEF) does not cover this project.
 - NEF's loan ratios are mostly 70%.
 - Government-set interest rate III is applied to the projects for the construction of Internet access centers in sparsely-populated areas (fiscal 1999 only).
 - Government-set interest rate III is applied to businesses granted subsidies for the emergency development of facilities designated by the Private Participation Promotion Law (extended to the end of fiscal 1999)
 - From the 5th year of the project, government-set interest rate II is applied.
 - The loan ratio of 50% is revised flexibly when the 50% ratio inflicts damages to private final institutions' loans (extended to the end of fiscal 1999)
 - Special low interest rates for new technologies are applied to new technologies exerting a significant impact on the society and of a public nature (extended to the end of fiscal 1999)
 - Special interest loan for new businesses I is applied to the projects approved by the Minister of Posts and Telecommunications; special interest loan for new businesses II is applied to those confirmed by the minister.
 - Special interest rate for nurturing cutting-edge businesses (an ultra-low interest rate examined from many aspects) is to be applied for those businesses that are very innovative and granted the treatments of the special interest rate for new technologies as well as special interest loan for new businesses I, but refused financing by commercial banks (fiscal 1999 only).
 - α varies depending on changes in interest rates, types of imports or investments and loan periods.
 - Projects with shadings are new projects approved in the 1999 budget request; projects with an underline () are extended/expanded projects.

Appendix 42 Taxation system reforms for fiscal 1999 in the info-communications field

Item	Details
Creation of tax systems for promoting digitalization of terrestrial broadcasting facilities	<p>Local tax (tax on fixed assets) Target: Terrestrial TV broadcasters Applicable facilities: 1) program production facilities, 2) digital transmission equipment, 3) digital transmitting/receiving equipment Special treatment: Basis of tax assessment is three-fourth the level of fiscal 1993 Period: From the enforcement date of Extraordinary Law for Promoting Development of Advanced TV Broadcasting Facilities to March 31, 2001</p> <p>National tax (income tax, corporate tax) Target: Local TV broadcasters and program production companies Applicable facilities: Certain digital facilities that enhance efficiency in program production Special treatment: Special redemption rate 15% Period: From the enforcement date of Extraordinary Law for Promoting Development of Advanced TV Broadcasting Facilities to March 31, 2001</p>
Creation of tax systems for instantaneous depreciation of info-communications equipment	<p>National tax (income tax, corporate tax) Target: Self-employed persons or corporations Applicable facilities: 1) computer, 2) digital photocopier, 3) facsimile, 4) digital PBX, 5) digital push-button telephone equipment, 6) electronic filing equipment, 7) microfilm equipment, 8) IC card equipment Special treatment: Total of general redemption amount and special redemption amount can be redeemed during the fiscal year when purchased were these equipment Period: From April 1, 1999 to March 31, 2000</p>
Creation of PFI promotion tax systems	<p>Local tax (special land-owning tax) Target: Companies that choose applicable projects in accordance with the Law Regarding to Promote Provision of Public Facilities and Other Related Services by Use of Private Capital and Other Resources (deliberations are under way at the 145th Diet session) Applicable assets: Lands to be used by these companies Special treatment: No tax on the assets</p>
Expansion of tax systems for promoting development of new-generation communications networks	<p>Local tax (tax on fixed assets) Target: Type I telecommunications carriers Applicable equipment: Cable modem Special treatment: Basis of tax assessment is three-fourth the level of fiscal 1993 Period: From April 1, 1999 to March 31, 2000</p>
Expansion and extension of tax systems for promoting construction of advanced cable TV broadcasting facilities	<p>Local tax (tax on fixed assets) Target: Cable TV broadcasters Applicable facilities: [New] Digital transmission equipment [Continued] subscriber fiber-optic cable, optical transmitter for communications Special treatment: Basis of tax assessment is five-sixth the level of fiscal 1993 Period: From April 1, 1999 to March 31, 2001</p>
Modification/extension of the tax exemption system on additional research expenses	<p>National tax (income tax, corporate tax) Target: Self-employed persons or corporations Applicable expenses: Research expenses counted as a loss in calculating the total income Special treatment: In cases where the total research expense in a fiscal year is larger than the "research expense for comparison," which is the average of three largest yearly research expenses marked over the past five years, 15% of the exceeded amount (or up to 12% of the corporate tax) is exempted from taxation; this is, however, applicable only when the total research expense in the fiscal year exceeds that of previous year and the year before the previous year. Note: When the special research expense is recorded in the fiscal year, the 12% tax exemption limit can include a portion of 15% of the special research expense up to 14% of the corporate tax. Period: From April 1, 1999 to March 31, 2001</p>
Others	<ol style="list-style-type: none"> 1) Tax system for enhancing reliability of telecommunications systems National tax (corporate tax) Redemption rate 11% → 9%, extended 2 more years 2) Special treatment for the extension of loss carrying-over period regarding new telecommunications carriers and broadcasters National tax (corporate tax) Extended 2 more years 3) Tax system for promoting investment in telecommunications "venture" equipment National tax (income tax, corporate tax) Extended 1 more year 4) Tax system for fortifying financial base of small- and medium-sized enterprises (SMEs) National tax (income tax, corporate tax) Target of tax exemption: from corporation with capital of 100 million yen → to corporations with capital of 30 million yen, extended 2 more years 5) Tax system for strengthening technologies at SMEs National tax (income tax, corporate tax), local tax (corporate residential tax) Extended 2 more years 6) Tax system for revitalization of central city districts Local tax (corporate office tax), applicable conditions relaxed 7) Tax system concerning the Multipolarization Law National tax (corporate tax) Redemption rate 9% → 8%, extended 2 more years Local tax (special land-holdings tax, corporate office tax) Extended 2 more years 8) Tax system concerning the Law for the Development of Osaka Bay Area National tax (corporate tax) Redemption rate 12% → 11%, extended 2 more years 9) Special tax exemption system on incomes from overseas transactions such as those involving technologies National tax (income tax, corporate tax) Submission of patents exempted, extended 2 more years

Appendix 43 Access Points to Japan Gigabit Network

Block	Access Point
Hokkaido	NTT Odori 4-chome Building
	Hokkaido University Computing Center
	Sapporo Information Network
Tohoku	NTT Sendai Tsutsujigaoka Building
	University of Aizu Information Systems and Technology Center
	Iwate University Media Center
	Tohoku University Computing Center
	Sendai City Information and Industry Plaza Net U
Kanto	NTT Otemachi Main Building
	Tsukuba Gigabit Center
	Waseda University Global Information and Telecommunication Institute
	University of Tokyo Intelligent Modeling Laboratory
	National Center for Science Information Systems
	University of Electro-Communications Information Processing Center
	Yokosuka Telecom Research Park (YRP)
	Yamanashi Open Research Center
Shin-etsu	NTT Ishido Building
	Niigata University Integrated Information Processing Center
	Nagano City FULLNET CENTER
	The Juridical Foundation of Matsumoto Software Development Center
Hokuriku	NTT Kanazawa Sainen Building
	Toyama Total Information Center
	Ishikawa High-Tech Conference Center
Tokai	NTT Atsuta Building
	Softpia Japan Center
	Nagoya University Computing Center
	Mie Prefectural College of Nursing
	University of Shizuoka
Kinki	NTT Osaka Awaji Building
	Keihanna Gigabit Center
	Kyoto University
	Osaka University Computing Center
	Nara Institute of Science and Technology
Chugoku	NTT Okayama-shi Nakasange Building
	Shimane Prefectural Office
	Teleport Okayama Building
	Hiroshima University Information Processing Center
Shikoku	NTT Kagawa NWC Building (Ward E)
	Kagawa Creation of New Industries Support Center
	University of Tokushima Faculty of Engineering
Kyushu/Okinawa	NTT Tenjin Building (South Ward)
	Kitakyushu Gigabit Center
	Kyushu University Computing Center
	NetCom Saga Association
	Asia-Pacific Multimedia Hub Center

Appendix 44 Strength of radio radiation (concerning the Regulations for Enforcement of the Radio Law, Article 21-3)

Frequency	Electric field strength (V/m)	Magnetic field strength (A/m)	Power flux density (mW/cm ²)	Average time
1. More than 10 kHz to 30 kHz	275	72.8	/	6
2. More than 30 kHz to 3 MHz	275	2.18 f ⁻¹		
3. More than 3 MHz to 30 MHz	824 f ⁻¹	2.18 f ⁻¹		
4. More than 30 MHz to 300 MHz	27.5	0.0728	0.2	
5. More than 300 MHz to 1.5 GHz	1.585 f ^{1/2}	f ^{1/2} /237.8	f/1500	
6. More than 1.5 GHz to 300 GHz	61.4	0.163	1	

Notes: 1. "f" indicates frequencies in the unit MHz.

2. Figures for the electric field strength and magnetic field strength are effective value.

3. In the cases where the human body is exposed to radio waves whose strength is not regarded as uniform in the vicinity of the body and the Minister of Posts and Telecommunications considers the judgements made based on this table to be unreasonable, the Minister will make other tables of radio radiation strengths to the public.

4. In the cases where more than one radio stations in the same location or in adjoining areas emit radio waves, or where one radio station emits more than one radio waves of different frequencies, the sum of ratio of the squared electric and magnetic field strengths of each frequency component to the square of its corresponding value in this table, or ratio of power flux density of each frequency component to its corresponding value in this table shall not exceed 1, respectively.

Appendix 46 Sites for advanced info-communications system model city construction program

Prefecture	Promoter
Hokkaido	Betsukai Town
Saitama	Tokorozawa City
Tokyo	Setagaya Ward
	Itabashi Ward
	Shinjuku Medical Association
	Edogawa Medical Association
Yamanashi	Yamanashi Prefecture
Niigata	Joetsu Cable Vision, Ltd.
Fukui	Fukui Prefecture
Aichi	Himawari Network, Ltd.
Gifu	Kani City
	Mie Prefecture
Mie	CTY Co., Ltd.
	Hiroshima Medical Association
Hiroshima	Hiroshima Medical Association
Tokushima	Tokushima Prefecture
Kochi	Kochi Prefecture
Fukuoka	Kita Kyushu Information Plaza
	Omuta City

Appendix 47 Sites for project for enhancement of regional and life-related information infrastructure

1. Local government networks construction support project

Prefecture	Promoter
Hokkaido	Iwamizawa City
	Kitami City
	Fukagawa City
	Yubari City
	Tomamae Town
Akita	Akita Prefecture
Yamagata	Yonezawa City
	Nanyo City
Miyagi	Shiroishi City
	Iwanuma City
Fukushima	Katsurao Village
Tochigi	Moka City
	Kanuma City
Gunma	Ota City
	Azuma Village
Tokyo	Mitaka City
Kanagawa	Yokohama City
	Atsugi City
	Odawara City
	Sirane Town
Yamanashi	Shimobe Town
	Obuchizawa Town
	Nagano City
Nagano	Nagano City
Toyama	Namerikawa City
	Shinminato City
	Uozu City
	Nyuzen Town
Ishikawa	Kanazawa City
Fukui	Fukui City
	Sabae City
Shizuoka	Hamamatsu City
	Nishiizu Town
Aichi	Okazaki City
	Gamagori City
	Nagakute Town
	Asuke Town
Gifu	Gifu Prefecture
	Ogaki City
	Tanigumi Town

Prefecture	Promoter
Kyoto	Kyoto City
	Sonobe Town
	Kumiyama Town
Osaka	Osaka City
	Habikino City
Hyogo	Takino Town
	Akashi City
	Amagasaki City
Nara	Nosegawa Village
Wakayama	Hashimoto City
	Tanabe City
	Misato Town
	Oto Village
Okayama	Kuse Town
	Tsuyama City
Hiroshima	Mihara City
Yamaguchi	Hagi City
Kagawa	Mino Town
Tokushima	Nakagawa Town
Fukuoka	Kitakyusyu City
	Yamada City
	Iizuka City
Saga	Nakabaru Town
	Takeo City
Kumamoto	Kumamoto City
	Nagasu Town
Oita	Oita Prefecture
Kagoshima	Kagoshima City
Okinawa	Okinawa Prefecture

2. Telework center facilities construction project

Prefecture	Promoter
Hokkaido	Iwamizawa City
Yamagata	Yamanobe Town
	Asahi Town
	Shirataka Town
Kumamoto	Aso Town

3. New-generation local cable TV stations construction project

Prefecture	Municipality	Promoter
Hokkaido	Sirataki Village	Sirataki Village
	Ikeda Town	Ikeda Town
	Obihiro City	Obihiro City Cable
Aomori	Misawa City	Misawa City
	Aomori City	Aomori Cable Television
	Hachinohe City	Hachinohe Cable Television
Iwate	Mizusawa City	Mizusawa TV
	Morioka City	Iwate Cable Television
	Kitakami City	Kitakami Cable Television
	Ichinoseki City	Ichinoseki Yuusen TV
Yamagata	Yonezawa City	New Media Yonezawa
	Nanyo City	
	Takahata Town	
	Kawanishi Town	
	Yamagata City	
	Tendo City	Cable Television Yamagata
Tochigi	Ashikaga City	Ashikaga Cable Television
Chiba	Narashino City	Town Television Narashino
Kanagawa	Chigasaki City	Television Chigasaki
Niigata	Aikawa Town	Sado Cable Television
	Hamochi Town	Hamochi Town
Nagano	Suzaka City	Sudaka Cable Television
Ishikawa	Kanazawa City	Kanazawa Cable Television
	Kaga City	Kaga Cable Television
Toyama	Himi City	Cable Net Himi
	Shinminato City	Shinminato Cable Network
	Takaoka City	
	Toyama City	Cable TV Toyama
	Fuchu Town	Kaminei Cable Television
Fukui	Fukui City	Fukui City
Aichi	Toyohashi City	Toyohashi Cable Network
Mie	Iinan Town	Iinan Town
	Ueno City	Ueno City
	Misugi Town	Misugi Village
	Matuzaka City	Matsuzawa Cable TV Station
	Ise City	Ise Cable Network
	Suzuka City	Cablenet Suzuka
	Hisai City	Tsu Cable Television Co., Ltd.
	Geino Town	
	Misato Village	
	Ureshino Town	
Shiga	Omi-hachiman City	Omi-hachiman Cable Network
	Kasagi Town	Kasagi Town
Hyogo	Kakogawa City	Kakogawa Shokoh Kaihatsu Co., Ltd.
Tottori	Yonago City	Chukai Cable Television
Hiroshima	Hiroshima City	Fureai Channel
Yamaguchi	Yamaguchi City	Yamaguchi Cablevision
Kagawa	Oonohara Town	Mitoyo Cable Television
	Nio Town	
Ehime	Yuge Town	Yuge Town
Tokushima	Tokushima City	Cable Television Tokushima
Fukuoka	Fukuoka City	Fukuoka Cable Television
	Kurume City	Cable Television Kurume
Saga	Imari City	Imari Cable Television
	Takeo City	Takeo TV
Nagasaki	Fukue City	Fukue Cable Television
	Shimabara City	Cable Television Shimabara
	Fukae Town	
Kumamoto	Kumamoto City	Kumamoto Cable Network

4. Information barrier-free telework center facilities construction project

Prefecture	Promoter
Ishikawa	Kanazawa City
Gifu	Tanigumi Village

5. Regional Intranet infrastructure construction support project

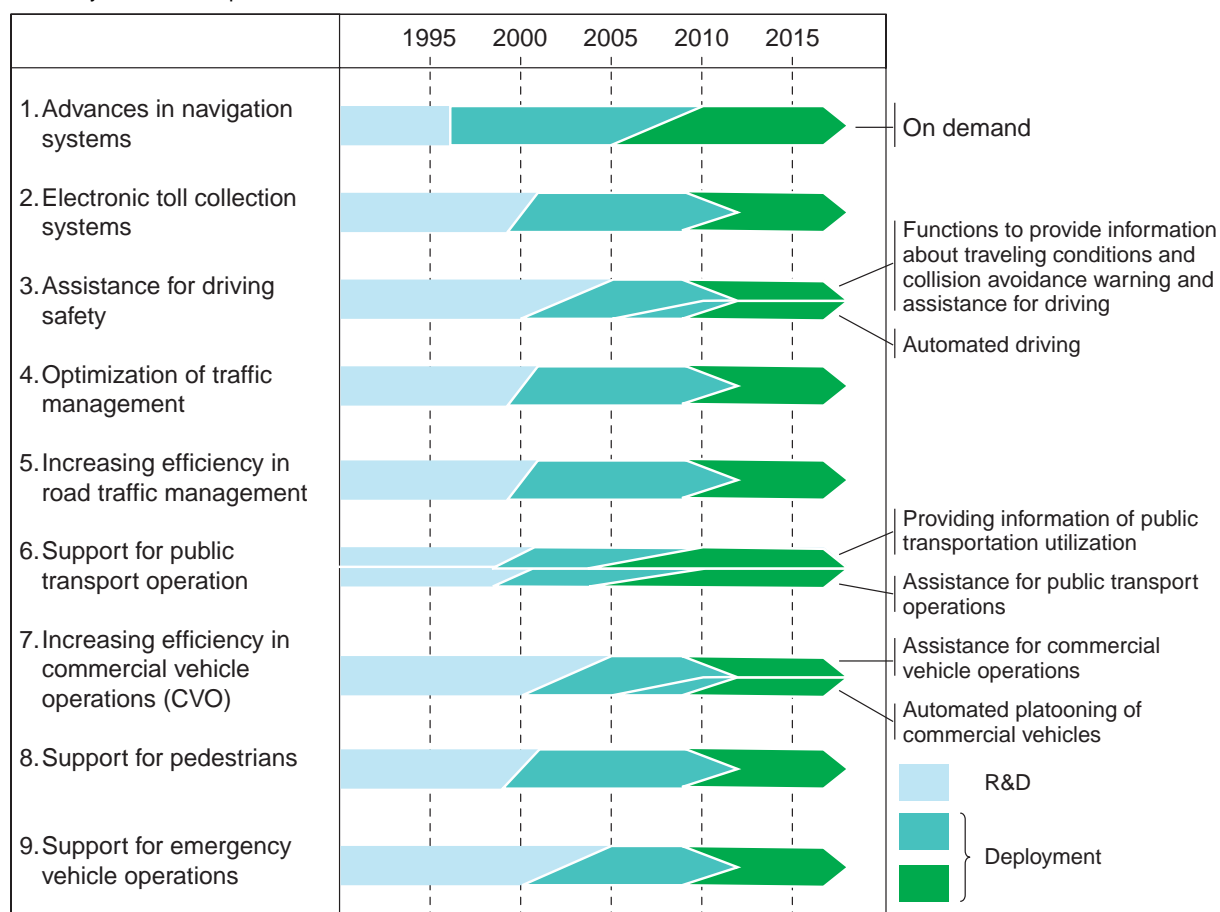
Prefecture	Promoter
Hokkaido	Asahikawa City
	Fukagawa City
Miyagi	Sendai City
Nagano	Ina City
Shizuoka	Shizuoka Prefecture
Osaka	Ikeda City
Okayama	Okayama Prefecture

6. Central districts revitalization multimedia project

Prefecture	Promoter
Nagano	Shiojiri City
Hyogo	Sumoto City

Appendix 48 ITS development/deployment plan

The "Comprehensive Plan for ITS in Japan" sets the development and deployment goals for the nine development areas shown in the figure below, giving due consideration to the development status of related systems, to progress in R&D work as well as to similar systems developed overseas for each of the nine areas.



Appendix 49 Expected applications of ITS info-communications systems

The “Comprehensive Plan for ITS in Japan” (formulated in July 1996 by five ministries and agencies in charge of ITS) sets “20 user services.” Based on these, the five ministries and agencies have newly set 39 applications expected for ITS info-communications systems in five fields that are closely related to the Japanese people’s lives. Target years for realizing these applications are also indicated in the figure below.

Example of applications and target year

Target year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Category															
Road, traffic information				<ul style="list-style-type: none"> On-demand type car navigation system Destination point weather forecast information system Pedestrian route guidance, leading system <ul style="list-style-type: none"> Automatically updated road and geographic information <ul style="list-style-type: none"> Optimal route-guidance system Parking-lot vacancy information, reservation system Traffic congestion, estimated driving time information system 										<ul style="list-style-type: none"> Exchange of route information between vehicles 	
ETC, DSRC (Dedicated short range communications)				<ul style="list-style-type: none"> ETC system <ul style="list-style-type: none"> Unmanned parking-lot control system Gas station charging settlement system Automated gateway, vehicle control system Automated check-in system for a car ferry Drive-through convenience store shopping system <ul style="list-style-type: none"> Cargo-tag physical distribution (PD) management system for a distribution center Multi-purpose wireless IC card settlement system 											
Car multimedia system				<ul style="list-style-type: none"> Provision of destination-related information system (travel, sightseeing, recreation) A variety of booking system (public transportation, hotel, amusement facilities) <ul style="list-style-type: none"> Car-mounted on-line shopping system Car-mounted Internet access system <ul style="list-style-type: none"> Car-mounted electronic secretary system (information search, electronic settlement system) Entertainment information provision system Tandem communications system between vehicles 											
PD, public transportation systems				<ul style="list-style-type: none"> Commercial vehicles location system Container location, tracing/tracking system <ul style="list-style-type: none"> Public transportation utilization information system <ul style="list-style-type: none"> Optimal realtime car allocation system Public transport operations management system <ul style="list-style-type: none"> Total delivery system Integrated PD operation system Shared-use short-distance individual transport system 											
Support for pedestrians, driving safety				<ul style="list-style-type: none"> Stolen vehicles tracking system Automated emergency accident notification system <ul style="list-style-type: none"> Danger warning system at an intersection and a turning point Provision of road conditions information system <ul style="list-style-type: none"> Collision avoidance/driving control radar system Driver/vehicle condition information notification system <ul style="list-style-type: none"> Optimal route guidance and control system Automated driving system for commercial vehicles 											

Appendix 50 Selected ITS model districts and experimental themes

Local autonomous body	Experimental theme
Toyota City (Aichi Prefecture)	ITS model district experiments — IN Toyota
Kochi Prefecture	ITS proposals from KoCoRo (Kochi Communication Road) area
Tokyo Metropolis (Tokyo Metropolitan Police Board)	Efficiency verifications experiments on the public transport priority system (PTPS) in urban districts within the metropolitan area
Gifu Prefecture	<ul style="list-style-type: none"> • Creation of the “recycling society” through use of mobile communications • Feasibility study on Gifu Prefecture’s ITS-related information provision system through use of private-sector initiatives
Okayama Prefecture	ITS model district experiment in Okayama Prefecture

Appendix 51 Activities of the Asia-Pacific Economic Cooperation (APEC) forum in 1998

Names of conferences	Period	Place	Highlights
The 3rd Ministerial Meeting on Telecommunications and Information Industry (TELMIN 3)	June 3 - 5	Singapore	Adoption of Singapore Declaration, Joint Communique of Ministers Adoption of MRA on Conformity Assessment for Telecommunications Equipment Adoption of Reference Framework of Action for Electronic Commerce
The 17th Meeting of Telecommunications Working Group (APEC TEL 17)	March 11 - 13	Bandar Seri Begawan (Brunei)	Holding of seminar on electronic commerce Preparation for TELMIN 3 Promotion of APEC Joint International Projects
The 18th Meeting of Telecommunications Working Group (APEC TEL 18)	September 7 - 11	Port Moresby (Papua New Guinea)	Discussion on setting interconnection guidelines Promotion of MRA on telecommunications equipment Promotion of APEC Joint International Projects
The 6th Economic Leaders' Meeting (Informal Summit Meeting)	November 17 - 18	Kuala Lumpur (Malaysia)	Adoption of Economic Leaders' Meeting Declaration
The 10th Ministerial Meeting	November 14 - 15	Kuala Lumpur (Malaysia)	Adoption of Joint Statement of Ministers Adoption of APEC Blueprint for Action on Electronic Commerce
The Senior Officials' Meetings The 1st	February 14 - 17	Penang (Malaysia)	Examination of working plan for 1998 Establishment of Taskforce for Electronic Commerce Organization of Subcommittee for Cooperation of Economy and Technology Start-up of setting of implementation program for early liberalization of 9 categories
The 2nd	June 18 - 20	Kuching (Malaysia)	Holding of discussion on setting working plan for promotion of electronic commerce Examination of implementation program for early liberalization of 9 categories
The 3rd	September 13 - 15	Kuantan (Malaysia)	Review of working plan for promotion of electronic commerce Decision of implementation program for early liberalization of 9 categories as well as individual action plans
The Informal Senior Officials' Meeting	November 12 - 13	Kuala Lumpur (Malaysia)	Preparations for Ministerial Meeting and Economic Leaders' Meeting
Preparatory Session for the Senior Officials' Meeting	December 10 - 11	Singapore	Examination of working plan for 1999 Follow-up for Kuala Lumpur Declaration of Economic Leaders' Meeting
The 5th Ministerial Meeting on Trade	June 22 - 23	Kuching (Malaysia)	Approval of working plan for promotion of electronic commerce Discussion on implementation program for early liberalization of 9 categories Confirmation of agreement reached at TELMIN 3 on MRA on Telecommunications Equipment
The Meetings of Task Forces on Electronic Commerce			Formulation of Blueprint for Action on Electronic Commerce
The 1st	February 18	Penang (Malaysia)	
The 2nd	June 11 - 12	Kuching (Malaysia)	
The 3rd	September 4	Singapore	
The 4th	October 20 - 21	Kuala Lumpur (Malaysia)	

Appendix 52 Major ITU conferences during 1998

Name of conference	Period	Place	Highlights
World Telecommunications Policy Forum (WTPF-98)	March 16 - 18	Geneva, Switzerland	<ul style="list-style-type: none"> • Examination of WTO Agreement on Trade in Basic Telecommunication Services • Investigation of Telecommunications Development • Promotions for reform of the international accounting rate and settlement systems
World Telecommunications Development Conference (WTDC-98)	March 23 - April 1	Valetta, Malta	<ul style="list-style-type: none"> • Deliberation on and adoption of the Valetta Action Plan (four-year activity plan of the development unit)
Annual Council 1998	May 20 - 29	Geneva, Switzerland	<ul style="list-style-type: none"> • Discussions on the ITU's annual activity plan, budget and account settlements, staff and strategic plans
Plenipotentiary Conference (PP-98)	October 12 - November 6	Minneapolis, U.S.A.	<ul style="list-style-type: none"> • Election of Yoshio Utsumi (then Deputy Minister of Posts and Telecommunications of Japan) as new Secretary-General of the ITU • Deliberations on revision of the ITU Constitution and Convention, strategic plans, budgets for the next four years, account settlement and issue of employees

Appendix 53 Activities of INTELSAT (fiscal 1998)

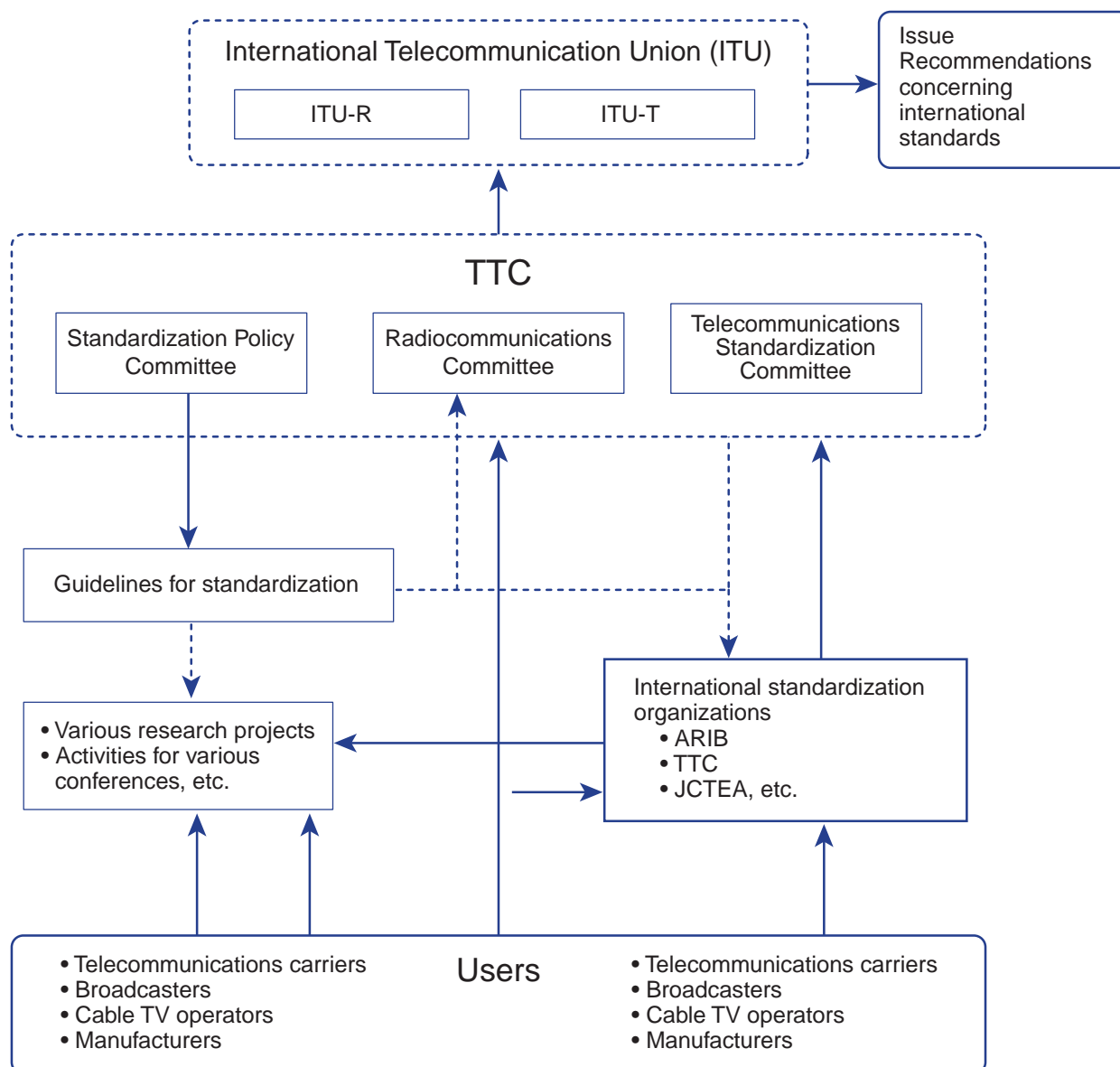
Outline of services	<ul style="list-style-type: none"> • By deploying its 19 geostationary satellites as of December 1998 — 5 above the Indian Ocean, 4 above the Pacific, and 10 above the Atlantic, respectively, INTELSAT provides telecommunications services via satellites to numerous countries in addition to its 143 member countries. The main services are as follows: <ol style="list-style-type: none"> 1) International connection service for public switched telecommunication networks 2) International TV broadcasting transmission service 3) Individual networks 4) Transponder service 5) Cable repairing service 6) VISTA service
Account (Income and Expenditure)	<ul style="list-style-type: none"> • There was an income of US\$1,020 million and an expenditure of US\$631 million upon fiscal 1998 account settlement. Japan's contribution accounted for 1.8% of the total capital, ranking 12th.
Recent moves	<ul style="list-style-type: none"> • At the 22nd Assembly of Parties in March 1998, INTELSAT decided to create a spin-off company that provides highly-competitive services including video transmission. INTELSAT itself continues providing such basic services as voice and data transmission. This wholly-owned subsidiary, New Skies Satellites, N.V., was established in The Hague, the Netherlands, in November 1998.

Appendix 54 Activities of Inmarsat (fiscal 1998)

Outline of services	<ul style="list-style-type: none"> • Inmarsat service covers the entire globe with its 9 geostationary satellites — 2 above the Indian Ocean, 2 above the Pacific and 5 above the Atlantic, respectively, as of December 1998. Its 86 member countries and many other countries use Inmarsat services for communications services. The main services are as follows: <ol style="list-style-type: none"> 1) Inmarsat A (telephone, telex, facsimile and data) 2) Inmarsat B (telephone, telex, facsimile and data) 3) Inmarsat C (data) 4) Inmarsat M (telephone, data and facsimile) 5) Inmarsat Aero (telephone, data and facsimile) • The Safety of Life at Sea (SOLAS) Convention obliges oceangoing vessels to install Inmarsat vessel earth stations (A, B or C) as communications equipment in distress.
Account (Income and Expenditure)	<ul style="list-style-type: none"> • There was an income of US\$406 million and an expenditure of US\$281 million upon fiscal 1998 account settlement. Japan's contribution accounted for 7.6% of the total capital, ranking 3rd after the U.S. (22.2%) and the U.K. (8.5%).
Recent moves	<ul style="list-style-type: none"> • Inmarsat had promoted restructuring from the standpoint of "converting the body into a private firm as an international public corporation (IPC) while retaining the supervisory function of the Assembly of Member Governments." • At the 12th Assembly of Member Governments in April 1998, member governments agreed to amend the Convention and Operating Agreement to transfer its mobile satellite communications service unit to a private firm. • The official name of Inmarsat was changed from International Maritime Satellite Organization to International Mobile Satellite Organization that will oversee its new subsidiary.

Appendix 55 International standardization activities

International telecommunications standards are being set mainly by the ITU-T and the ITU-R of the International Telecommunication Union. In Japan, the Telecommunications Technology Council (TTC) compiles ideas of concerned organizations through deliberations, contributing to such international standardization activities.



ITU-R: ITU-Radiocommunication Bureau. ITU-R conducts revision of radio communications regulations, research into radio communications technologies/operations and compilation of Recommendations thereof, in addition to frequency allocation and registration.

ITU-T: ITU-Telecommunication Standardization Bureau. ITU-T conducts studies on telecommunications technologies, their operations and tariffs, as well as compilation of Recommendations thereof.

ARIB: Association of Radio Industries and Businesses

TTC: Telecommunications Technology Council

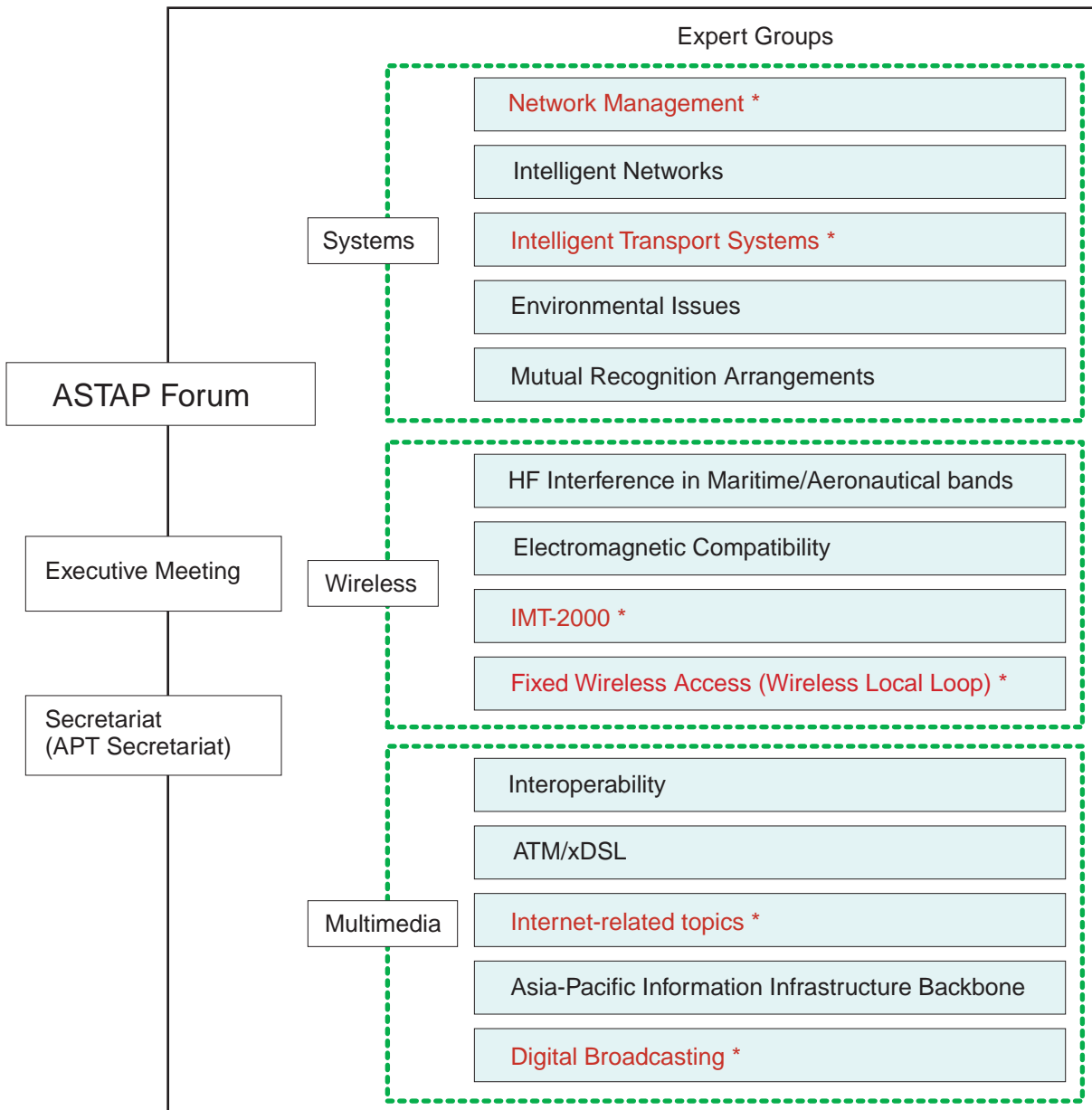
JCTEA: Japan Cable Television Engineering Association

Appendix 56 Standardization activities in the Asia-Pacific region

Along with the advancement of info-communications technology in recent years, regional cooperation in standardization activities has become much more important upon contributing to international standardization activities of the ITU and other standardization organizations. Against this backdrop, the Asia-Pacific Telecommunity (APT) in November 1997 set up the APT Standardization Program (ASTAP) in order to contribute from Asia to the establishment of global standards, through enhanced standardization activities in the telecommunications field.

At the first ASTAP Forum held in February 1998, 14 Expert Groups (EGs) were established to work on standardization activities in the three Sections: "Systems," "Wireless" and "Multimedia." Of the 14 EGs, four EGs dealing with Intelligent Transport Systems (ITS), IMT-2000, Wireless Local Loop (WLL) and digital broadcasting were proposed by Japan.

Structure of ASTAP



* Japanese member appointed EG rapporteur

Appendix 57 Number of attested inspectors (as of end of fiscal 1998)

Region	Hokkaido Pref.	Tohoku	Kanto	Shinetsu	Hokuriku	Tokai	Kinki	Chugoku	Shikoku	Kyushu	Okinawa Pref.	Total (by type)
Type I	25	51	103	16	23	30	26	30	20	54	12	390
Type II	99	103	93	29	30	80	85	75	71	99	22	786
Type III	21	27	67	22	9	47	21	43	24	91	1	373
Total (by region)	145	181	263	67	62	157	132	148	115	244	35	1,549

Appendix

Appendix 58 Damages to info-communications systems caused by torrential rainfalls and measures taken for these damages (fiscal 1998)

Description	Places where National Disaster Relief Act applied	Info-communications-related issues		
		Stricken area	Damages	Emergency measures
Torrential rainfalls in Niigata City and adjoining areas (August 4, 1998)	3 areas	Niigata Pref.	Subscriber telephone line: About 470 line faults Cellular telephone: 11 base stations ceased radio wave transmission PHS: 275 cell stations ceased radio waves transmission Leased circuit: 4 line faults Other damages: Severe traffic congestions on subscriber telephone lines and cellular telephone networks in Niigata Prefecture	MCA radio equipment: 10 units rented out Temporary public phone: 17 units installed
Torrential rainfalls in northern Kanto region to southern Tohoku region (August 27, 1998)	10 areas	Fukushima, Tochigi, Miyagi and Shizuoka Prefs.	Subscriber telephone line: About 14,300 line faults Cellular telephone: 11 base stations ceased radio wave transmission PHS: 230 cell stations ceased radio waves transmission Broadcast relay station: 12 stations ceased radio wave transmission Other damages: Severe intermittent traffic congestions on subscriber telephone lines and cellular telephone networks in Fukushima and Tochigi Prefectures	Temporary public phone: 146 units installed at 32 locations; Satellite mobile phone: 9 units rented out Cellular phone: 60 units rented out; Simple radio equipment: 25 units rented out
Torrential rainfalls due to Typhoon No. 5 (September 16, 1998)	1 area	Chiba, Ibaraki, Miyagi, Fukushima and Hokkaido Prefs. and Tokyo Metropolis	Cellular telephone: 41 base stations ceased radio wave transmission PHS: 169 cell stations ceased radio waves transmission Broadcast relay station: 44 stations ceased radio wave transmission	No measures taken
Torrential rainfalls due to Typhoon No. 7 (September 22, 1998)	3 areas	Hyogo, Nara, Shiga, Wakayama, Aichi, Gifu, Mie, Shizuoka, Nagano, Kyoto and Osaka Prefs.	Subscriber telephone line: About 8,700 line faults Cellular telephone: About 300 base stations ceased radio wave transmission PHS: About 9,200 cell stations ceased radio wave transmission Broadcast relay station: 246 stations ceased radio wave transmission Cable TV station: 39 stations ceased broadcast signal transmission Transit line: 11 line faults Other damages: 5 disaster prevention and emergency communications systems for local governments in Gifu and Mie Prefectures and 1 coastal station for fisheries in Kochi Prefecture ceased radio wave transmission	Temporary public phone: 2 units installed
Torrential rainfalls in Kochi City and adjoining areas (September 25, 1998)	6 areas	Kochi, Ehime, Tokushima and Kagawa Prefs.	Subscriber telephone line: About 5,400 line faults Cellular telephone: 10 base stations ceased radio wave transmission PHS: 221 cell stations ceased radio waves transmission Broadcast relay station: 1 station ceased radio wave transmission Cable TV station: 2 stations ceased broadcast signal transmission Other damages: Severe traffic congestions on subscriber telephone lines and cellular telephone networks in Kochi Prefecture	Temporary public phone: 40 units installed at 15 locations; Radio equipment for communications services: 60 units rented out Cellular phone: 38 units rented out
Torrential rainfalls due to Typhoon No. 10 (October 17, 1998)	4 areas	4 Prefs. in Shikoku region, 5 Prefs. in Chugoku region, 4 Prefs. in Chubu region, plus Nara, Wakayama and Hyogo Prefs.	Subscriber telephone line: About 4,800 line faults Cellular telephone: 1 base station ceased radio wave transmission PHS: 40 cell stations ceased radio wave transmission Broadcast relay station: 12 stations in 5 locations ceased radio wave transmission Transit line: 1 line fault	Temporary public phone: 22 units installed Cellular phone: 1 unit rented out