

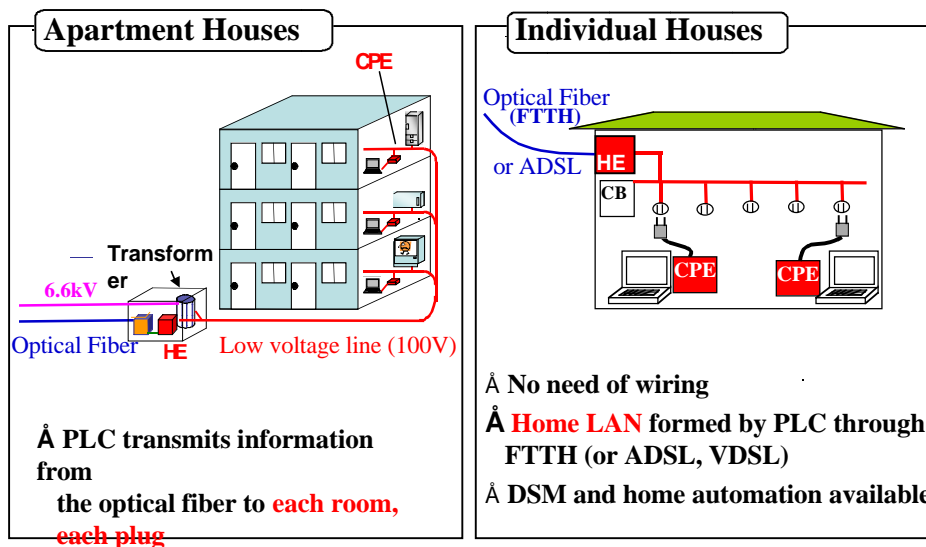
Regulation for PLC in Japan

June 10, 2003

PLC-J

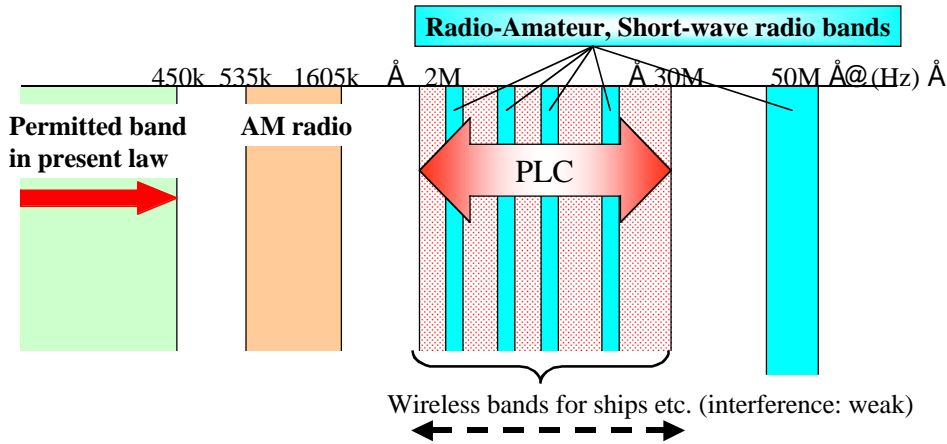
-High Speed Power Line Communication Promoters' Alliance-

Expected PLC Business in Japan



Use of HF Band in Japan ①

Permitted frequency band in present law under 450kHz



Use of HF Band in Japan ②

Wireless systems which might be influenced by PLC

Wireless System	Frequency	Bandwidth
Aircraft	1,700 - 1,705	5
Aircraft	1,705 - 1,800	95
Radio Amateur	1,810 - 1,825	15
Aircraft	1,825 - 2,000	175
Radio Amateur	1,908 - 1,913	5
SOS	2,174 - 2,181	7
Space Research	2,501 - 2,502	1
Aircraft	2,850 - 3,025	175
Aircraft	3,025 - 3,155	130
Aircraft	3,400 - 3,500	100
Radio Amateur	3,500 - 3,575	75
Radio Amateur	3,747 - 3,754	7
Radio Amateur	3,791 - 3,805	14
Aircraft	3,900 - 3,950	50
Emergency	4,650 - 4,670	20
Aircraft	4,650 - 4,700	50
Aircraft	4,700 - 4,750	50
Space Research	5,003 - 5,005	2
Aircraft	5,450 - 5,480	30
Aircraft	5,480 - 5,680	200
Aircraft	5,680 - 5,730	50
Aircraft	5,730 - 5,900	170
Broadcast / Aircraft	5,900 - 5,950	50
SW Radio	5,950 - 6,200	250
Aircraft	6,525 - 6,685	160
Aircraft	6,685 - 6,785	100
Radio Amateur	7,000 - 7,100	100
SW Radio	7,100 - 7,350	250
Aircraft	8,815 - 8,905	150
Aircraft	8,905 - 9,040	75
SW Radio	9,400 - 9,900	500
Space Research	10,005 - 10,005	2
Aircraft	10,005 - 10,100	95
Radio Amateur	10,100 - 10,150	50
Aircraft	10,150 - 11,175	1,025
Aircraft	11,175 - 11,275	100
Aircraft	11,275 - 11,400	125
SW Radio	11,600 - 12,100	500
Aircraft	13,200 - 13,260	60
Aircraft	13,260 - 13,360	100
Radio Telescope	13,360 - 13,600	240
Aircraft	13,610 - 13,570	160
RITD	13,553 - 13,567	14
Broadcast / Aircraft	13,570 - 13,600	30
SW Radio	13,600 - 13,800	200
Broadcast / Aircraft	13,800 - 13,870	70
Aircraft	13,870 - 14,000	130
Radio Amateur	14,000 - 14,350	350
Aircraft	14,350 - 14,990	640
Space Research	15,005 - 15,010	5
Aircraft	15,010 - 15,100	90
SW Radio	15,100 - 15,800	700
SW Radio	17,480 - 17,900	420
Aircraft	17,900 - 17,970	70
Aircraft	17,970 - 18,030	60
Space Research	18,052 - 18,068	16
Radio Amateur	18,068 - 18,168	100
SW Radio	18,900 - 19,020	120
Space Research	19,996 - 19,995	5
Aircraft	20,610 - 21,000	390
Radio Amateur	21,000 - 21,450	450
SW Radio	21,450 - 21,850	400
Aircraft/Space	21,870 - 21,924	54
Aircraft	21,924 - 21,900	24
Aircraft/Space	23,200 - 23,330	130
Radio Amateur	24,890 - 24,900	100
Space Research	25,005 - 25,010	5
Radio Telescope	25,570 - 25,670	100
SW Radio	25,670 - 26,100	430
Radio Amateur	28,000 - 29,700	1,700
Sum		12,713

Regulation for PLC in Japan

Radio Law : Clause 100

(Equipment using high frequency)

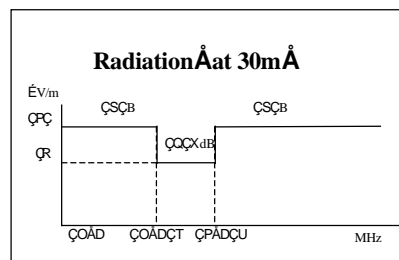
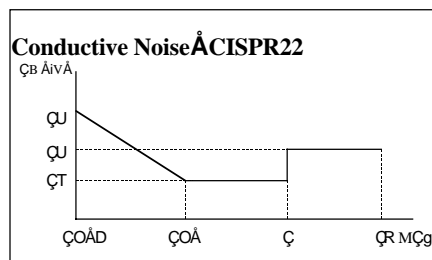
- Permit by Minister required for communication equipment applying frequency above 10kHz to power line

Radio Law Regulation: Clause 44

- No permit but notification required for PLC equipment in 10kHz – 450kHz defined in Clause 46

Radio Law Regulation: Clause 46

- **PLC Type Products designated by Ministry**
 - Max. transmission period and interval, transmission power, and EMC specified



Regulation for Wireless Equipment: Clause 60

- Radiation from a power line should be less than **500µV/m (54dBµV/m)** at the point of $\lambda/2\pi$

Activities for Deregulation

- Apr. 2001 **“Study Group for PLC”** founded in **ARIB***. Discussion for deregulation started in the committee.
Strong opposition came mainly from a broadcasting company and radio amateurs.
- Jan. 2002 PLC communication and radiation tests were conducted in Akagi.
- Mar. 2002 **No agreement reached** among PLC modem manufacturers, power utilities and a broadcasting company.

Å* **ARIB(Association of Radio Industries and Businesses)**

: Organization of companies related with radio equipment (utilities, manufacturers) for investigation, research & development and consultation of utilization of radio waves, and realization and popularization of new radio systems

- Apr. 2002 New organization **“PLC Study Group”**** founded in Japanese government.
- Jun/Jul. 2002 PLC communication and radiation tests were conducted in several places.
- Jul. 2002 **“PLC Study Group”** concluded;
“Commercialization is too early”
- Mar. 2003 **“PLC-J”** was founded to accelerate the deregulation for PLC.

** **“PLC Study Group”**

Å@Å@Å consists of professors, researchers in institutes and NHK (no power utilities

Å@Å@Å and PLC manufacturers participated)

Oppositions

1. Broadcasting Company

- Possible interference with SW radio

2. Radio Amateur People

(More than 1 million people have license)

- Possible interference with their equipment

3. Radio Telescope (Observatory)

- Possible degradation of sensitivity

4. Air Traffic Control

- Possible interference with the signal at emergency

Main Concerns

- **Accumulation effect** of radiation from distributed modems
- **Attenuation of the radiation** by distance and by obstacles

Discussions for Deregulation

- **Limit of radiation**

**“Weak Wireless Level” = 54dB μ V/m at 3m
(Radiation for equipment without license)**

- Necessity of power mask for specific frequency band discussed

- **Limit of conductive noise**

- Measurement of LCL in Japan

⇒ Follow discussions in CISPR


Conclusion of Japanese Government (Jul. 2002)

- Current PLC technology could affect other equipment^Å
(Some technologies showed **larger radiation** than
“Weak Wireless Level” = 54dB μ V/m at 3m)
- **Allocation of HF band for PLC is too early**
- **Experimental application of PLC is needed** to improve the technology for less radiation under special permit
- Active participation in discussions on the world standards such as **CISPR** is expected for reflecting the situation in Japan

Current Activities in PLC-J

- **Proposal of conditions for Experiment to the government**
- **Development of technology for lower radiation**
 - Development at each company
 - Determination of evaluation method
- **Measurement of LCL in Japan**
 - Contribution to CISPR

Future Scope

- **Development of technology for lower radiation**
 - 
- **Verification of no interference at the field trial**
- **Contribution to the world standards like CISPR**
- **Proposal of regulation and standard for PLC suited to Japanese environment**
 - ⇒ **Commercial deployment in Japan**