IEEE P802.11
Wireless Access Method and Physical Specifications

Title: Radio LAN System Standardization Activities in Japan

Date: November 9, 1992

Source: "Report on Technical Requirements for Radio LAN System" (submitted by the Telecommunications Technology Council)

This paper reports on standardization activities for Radio LAN System in Japan.
In Japan, the technical requirements of Government, in order to promote efficient frequency use and interference protection of radio systems, are considered by the Telecommunications Technology Council of MPT (Ministry of Posts and Telecommunications). Radio LAN System is also discussed at this council.

On the other hand, concrete and detailed R&D of Radio LAN System is being conducted by Radio LAN System study group of the RCR (Research & Development Center for Radio Systems, since May 1991). The voluntary technical standards will be established by the Standard Committee of RCR.

Radio LAN System is being considered by dividing to following three types.

Type A : High-Speed, more than 10Mbps. Millimetre wave and/or quasi-microwave will be used. Common air interface will be discussed.
Type B : High-Speed, approx.10 - 15Mbps. 18 - 20 GHz.
Type C : Medium-Speed, approx.256 kbps - 2Mbps.
Spread spectrum on ISM band.

This July, a partial report on the " Technical Requirements for Radio LAN System " was submitted by the TTC.
The partial report deals with the technical requirements for Medium-Speed Radio LAN systems (Type C) and for High-Speed Radio LAN systems (Type B).
The main technical requirements for Midium- and High-Speed Radio LAN systems are shown in following paper.
Based on the findings in this partial report, MPT expects to revise the necessary ministerial ordinances.
Remained type A system is now being considered by TTC and RCR study group.

"Technical Requirements of Radio LAN Systems"

Technical Requirements of Medium-Speed Radio LAN Systems(Type C)

1. General Requirements
   (i) Communication system
   One-way, simplex, half-duplex or full-duplex.
   (ii) Spectrum scattering system
   The spectrum scattering system shall be the direct scattering (DS) system the frequency hopping (FH) system or the hybrid system between DS and FH systems (DS/FH system).
   (iii) Radio frequency band
   A frequency band shall be selected from the frequency band of 2400 to 2500MHz (ISM band) designated for industrial, scientific and medical (ISM) purposes as a new spectrum scattering system will be commercialized.
   (iv) Antenna power
   It will be appropriate to specify in density power as the ISM band will be used and it must be less than or equal to 10mW per MHz.
   (v) Control of illegal use
   The structure of the principal parts of the transmitting equipment must be such that they cannot be opened easily.

2. Technical requirements of radio equipment
   (i) Transmitting equipment
   (1) Allowable frequency deviation
   Must be less than or equal to +/-50 ppm.
   (2) Spurious emission intensity
   The spurious emission intensity at frequency "f" which excludes the designated frequency shall be as follows:
   a. Below 25μW at fL-fH =<f<fL and fU<f =<fU + fH
   b. Below 2.5μW at fL-fH>f and fU+fH < f
   where fL: Lower-limit frequency (MHz) of designated frequency band . (MHz)
   fU: Upper-limit frequency of designated frequency band (MHz)
   fH: Value obtained by multiplying the designated frequency bandwidth (MHz) by 0.5.
   (3) Allowable antenna power deviation
   20% above nominal and 80% below nominal.

(4) Tolerance of occupied frequency bandwidth
The tolerance of the occupied frequency bandwidth must be the required frequency bandwidth below the designated frequency bandwidth.
(5) Scattering bandwidth (90% frequency bandwidth of total power)
The scattering bandwidth shall be more than or equal to 500kHz.
(6) Scattering factor
The scattering factor (ratio of symbol rate of scattering bandwidth to clock frequency) should be more than or equal to 10.

(ii) Receiving equipment
(1) Undesired radiation
Undesired radiation must be less than or equal to 4nW at frequencies below 1GHz and less than or equal to 20nW at frequencies higher than 1GHz.

High-Speed Radio LAN System Technical Requirements (Type B)

1. General Conditions
(i) Communication system
oneway, simplex, half-duplex or full-duplex.
(ii) Transmission method
Time division duplex (TDD) system shall be used.
(iii)Modulation speed
Must be 10Mbps or higher.
(iv) Modulation system
Quadrature Amplitude Modulation (QAM), 4 level frequency shift keying (4-level-FSK), or Quadrature Phase Shift Keying (QPSK).
(v) Carrier frequency spacing
20MHz.In the case of interleave it is 10 MHz.
(vi) Radio frequency band
A frequency should appropriately be selected from the quasi-millimeter band (18 to 20GHz band).
(vii) Antenna Power
Antenna power shall be less than or equal to 300 mW.
(viii) Control of illegal use
The structure of the principal parts of the transmitting equipment must be such that they cannot be opened easily.

2. Technical Requirements of Wireless Equipment

(i) Transmitting equipment

(1) Allowable frequency deviation
Must be less than or equal to +/-10ppm.

(2) Spurious emission intensity
Must be less than or equal to 100 μW.

(3) Allowable antenna power deviation
20% above nominal and 80% below nominal.

(4) Allowable occupied band-width
Must be less than or equal to 17MHz.

(5) Adjacent channel leak power
Must be more than or equal to 40dB to the mean power within +/- 8.5 MHz band detuned 20 MHz frequency from the carrier.

(ii) Receiving equipment

(1) Receiving sensitivity
The receiver input power with a data packet error rate of 5 x 10**(-2) shall be less than or equal to -71dBm.

(2) Spurious response
Shall be higher than or equal to 10dB.

(3) Adjacent channel selectivity
Must be more than or equal to 25dB at a frequency detuned 20MHz from the carrier.

(4) Undesired radiation
Must be below or equal to 4 nW less than 1GHz. Must be below or equal to 20 nW above 1 GHz and 10 GHz. Must be below or equal to 20 μW above 10 GHz.

(iii) Antenna
Must be less than or equal to 20 dBi.