ENGLISH TRANSLATION

920MHz-BAND RFID EQUIPMENT FOR PREMISES RADIO STATION

ARIB STANDARD

ARIB STD-T106 Version 1.0

Version 1.0 February 14th 2012

Association of Radio Industries and Businesses

General Notes to the English Translation of ARIB Standards and Technical Reports

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Foreword

The Association of Radio Industries and Businesses (ARIB) investigates and summarizes the basic technical requirements for various radio systems in the form of “ARIB Standards”. These standards are developed with the participation of and through discussions amongst radio equipment manufacturers, telecommunication operators, broadcasting equipment manufacturers, broadcasters and users.

ARIB Standards include “government technical regulations” (mandatory standard) that are set for the purpose of encouraging effective use of frequency and preventing interference with other spectrum users, and “private technical standards” (voluntary standards) that are defined in order to ensure compatibility and adequate quality of radio equipment and broadcasting equipment as well as to offer greater convenience to radio equipment manufacturers, telecommunication operators, broadcasting equipment manufacturers, broadcasters and users.

This ARIB Standard is developed for 920MHz-BAND RFID EQUIPMENT FOR PREMISES RADIO STATION. In order to ensure fairness and transparency in the defining stage, the standard was set by consensus at the ARIB Standard Assembly with the participation of both domestic and foreign interested parties from radio equipment manufacturers, telecommunication operators, broadcasting equipment manufacturers, broadcasters and users.

Radio equipment defined in this standard utilizes 916.7 to 920.9MHz. In order to avoid harmful radio interferences to other radio systems, "Operational guidelines" is also documented and attached hereto as an annexx material.

ARIB sincerely hopes that this ARIB Standard will be widely used by radio equipment manufacturers, telecommunication operators, broadcasting equipment manufacturers, broadcasters and users.

The radio channel assignment of radio stations (channel 1 to 5) with antenna power no greater than 1mW, and the boundary frequency (922.3MHz in this standard) between channel sharing techniques defined on radio stations with antenna power no greater than 250mW, may be revised in future, reflecting changes of international regulations or prevalence of each category of radio stations.

Contents

Chapter 1 General Descriptions

1.1 Outline

Among the premises radio station defined in the Article 14 of the Regulations for Enforcement of the Radio Law and the Notification 378 of the Ministry of Posts and Telecommunications, 1986 (Revision by Notification 518 of Ministry of Internal Affairs and Communications, 2011), this standard specifies on Radio Frequency Identification (RFID) equipment that uses the frequency 916.7 MHz and more and 920.9 MHz or less specified in Article 49-9, Clause 1 of the Ordinance Regulating Radio Equipment Regulations. (This FRID refers to the identification of mobile objects that radio equipment performs the identification by receiving the radio wave emitted from an apparatus for responding which is activated and operated by the received RF power from interrogator and returns all or some portion of the received power to the interrogator as the same frequency radio wave, referred to as "responder" hereinafter.)

1.2 Scope of the standard

The radio station of RFID consists of radio equipment and data processing equipment and power supply equipment as shown in Figure 1-1. This standard specifies the technical requirements of radio equipment consisting of an interrogator, an antenna, and a responder, while the standard does not specify communication protocols between an interrogator and a responder (a standard for interoperability).

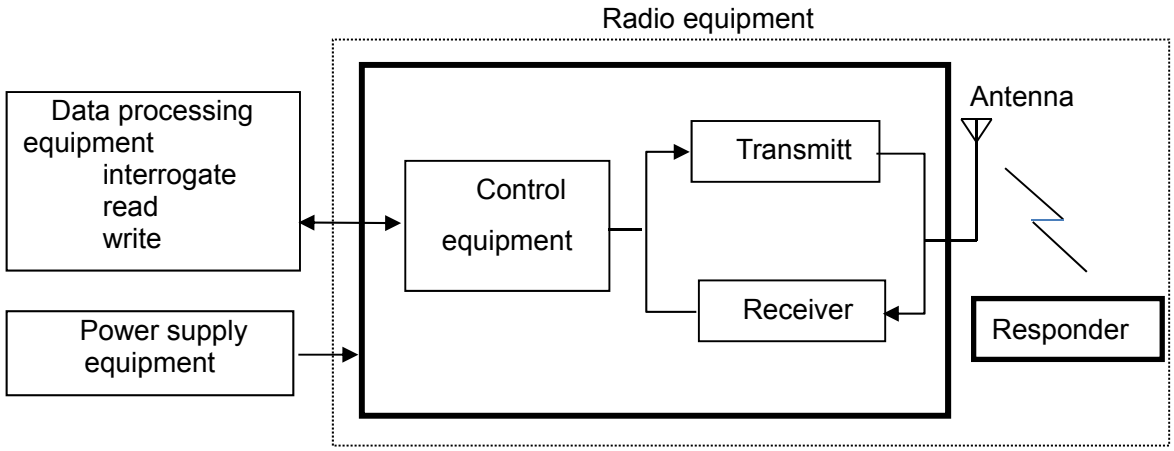


Figure 1-1 Structure of Radio Station of RFID

1.3 Reference regulations

In this standard, "RL" refers to the Radio Law, "RERL" refers to the Regulations for Enforcement of the Radio Law, "ORE" refers to the Ordinance Regulating Radio Equipment, "OTRCC" refers to the Ordinance Concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment and "NT" refers to a Notification of the Ministry of Posts and Telecommunications before 2000 or a Notification of the Ministry of Internal Affairs and Communications after 2001.

Chapter 2 Overview of the standard system

2.1 Standard system

2.1.1 Configuration of the standard system

The standard system consists of one interrogator and a plurality of responders as shown in Figure 2-1.

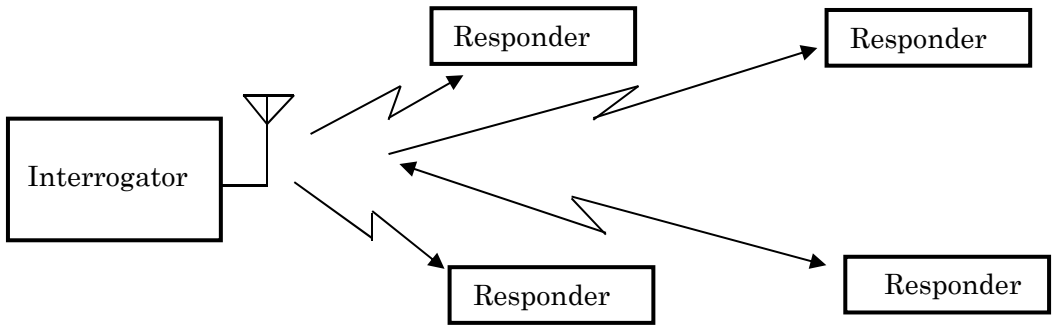


Figure 2-1 Configuration of Standard system

This system is expected to be used in various fields such as physical distributions, apparel industries, publications, management of entry/exit and the like, and the interrogator can generally be fixedly installed and operated continuously.

A responder consist of an Integrated Circuit (IC) chip and an antenna. It can be utilized as an automatic identification and recognition system by storing discrete identified information in the IC chip by read/write operation using radio waves. By radio waves, it is possible to read/write in a noncontact manner and to simultaneously read information on a plurality of responders.

2.1.2 Operation of the standard system

The mode of operation of the standard system is mentioned below.

- Passive tag system

  The passive tag system is a system in which a responder cannot emit radio wave autonomously but can transmit a response signal by using only the power of carrier wave received from an interrogator. Some of the passive tag systems, however, may have a battery for power supply, for example, to the internal circuit (such as a logic, a clock etc.) and an attached sensors etc. of the responder. Thus, for transmission to the interrogator, a back-scattering scheme that uses only a passive circuit (a scheme of modulation by changing a reflection coefficient of antenna bit by bit) is adopted.

The RFID system using a passive tag as a responder is called a passive tag system.

Having no frequency filter, a passive tag can communicate at any frequency provided that antenna can receive a signal and that an air-interface and protocols are the same. For 800/900MHz passive tag system, 860MHz-960MHz-band system is standardized by International Organization for Standardization (ISO). Actual radio frequency band for a passive tag system is different among Japan, U.S.A and EU. An 800/900MHz passive tag generally can be applicable to any frequency between 860 and 960 MHz, ensuring international operability of the passive tag system.

There are several 800/900MHz passive tag systems listed below.

① Specified Low Power Radio Station (ARIB STD-T90)
② Convenience Radio Station (ARIB STD-T100)
③ Premises Radio Station (ARIB STD-T89)
④ Premises Radio Station (ARIB STD-T106: this standard), and
⑤ Specified Low Power Radio Station (ARIB STD-T107).

In addition, there are a couple of active tag system in which the responder contains power source such as a battery and utilizes its energy for transmitting radio wave as follows:

① Specified Low Power Radio Station(ARIB STD-T96)
② 920MHz-Band Telemeter, Telecontrol and Data Transmission Radio Station (ARIB STD-T108).

These two systems are not included in this ARIB Standard (ARIB STD-T106).

2.2 Key parameters and functionality of the standard system

Key parameters and functionality of the standard system are shown in Table 2-1.

Table 2-1 Key parameters and functionality of the standard system

Item		Parameters and functionality
Frequency band		916.8, 918.0, 919.2, 920.4 920.6, 920.8 MHz
Transmission power		1 W or less
Service area (reference) for passive tag system		Up to about 5 m
Transmission method	Contents	Data signal
	Emission class	N0N A1D AXN H1D R1D J1D F1D F2D G1D
Antenna gain		6 dBi or less (absolute gain) However, in case EIRP（Equivalent Isotropically Radiated Power） is less than the value of 6 dBi plus 1 W of antenna power, it is allowed to fill in the gap by the antenna gain.

(Intentionally left blank)

Chapter 3 Technical requirements for radio equipment

The standard includes both “national technical criteria (mandatory)” and “private optional criteria”. A regulation and an article providing a legal basis are quoted for the former.

3.1 General conditions

3.1.1 Contents of communications

Signals for data transmission

3.1.2 Emission class (RERL: article 14, NT : No.378, 1986)

N0N, A1D, AXN, H1D, R1D, J1D, F1D, F2D or G1

3.1.3 Operating frequency band (RERL: article 14, NT : No.378, 1986)

(Revised NT No.518, 2011)

916.8, 918.0, 919.2, 920.4, 920.6, 920.8 MHz

3.1.4 Usage environment condition

Not specified.

3.2 Interrogator

3.2.1 Transmitter

(1) Antenna power (RERL: article 14, NT: No.378, 1986)

It shall be 1 W or less.

(2) Tolerance for antenna power (ORE: article 14)

+20%, -80%

(3) Radio channel (ORE: article 49-9)

(Revised Ministerial ordinance of MIC No.162, 2011)

A radio channel shall consist of up to three consecutive unit radio channels which are defined that their center frequencies are located from 916.8 MHz to 920.8 MHz, and 916.8 MHz, 918.0 MHz, 919.2 MHz, 920.4 MHz or 920.4 MHz with (n x 200) kHz separation where n is an integer and their bandwidth are 200 kHz.

The center frequencies of radio channels are shown through Table 3-1 to Table 3-4.

(a) The case of using one unit radio channel

Table 3-1 Center frequency of radio channel using one unit radio channel
(Interrogator using transmission time control and carrier sense)

Unit radio channel number	Center frequency (MHz)	Unit radio channel number	Center frequency (MHz)
5	916.8	23	920.4
11	918.0	24	920.6
17	919.2	25	920.8

Table 3-2 Center frequency of radio channel using one unit radio channel
(Interrogator without transmission time control and carrier sense)

Unit radio channel number	Center frequency (MHz)	Unit radio channel number	Center frequency (MHz)
5	916.8	17	919.2
11	918.0	23	920.4

(b) The case of using two unit radio channels

Table 3-3 Center frequency of radio channel using two unit radio channels
(Interrogator using transmission time control and carrier sense)

Unit radio channel number	Center frequency (MHz)	Unit radio channel number	Center frequency (MHz)
23, 24	920.5	24, 25	920.7

(c) The case of using three unit radio channels

Table 3-4 Center frequency of radio channel using three unit radio channels
(Interrogator using transmission time control and carrier sense)

Unit radio channel number	Center frequency (MHz)	Unit radio channel number	Center frequency (MHz)
23, 24, 25	920.6		

(4) Frequency tolerance (ORE: article 5, attached table No.1)
(Revised Ministerial ordinance of MIC No.162, 2011)

It shall be within 20×10^{-6}.

(5) Transmission method and Modulation method (RERL: article 14, NT: No.378, 1986)

One or a combination of the following transmission modes shall be adopted:

Amplitude modulation with double sidebands (A1D, AXN)or Amplitude modulation with single sideband (H1D, R1D, J1D), Angular modulation (F1D, F2D, G1D) and carrier wave (N0N).

(6) Permissible value for occupied bandwidth (ORE: article 6, attached table No.2 -8)

It shall be (200 x n) kHz or less. (Note: n is the number of unit radio channels constituting one radio channel and is an integer from 1 to 3.)

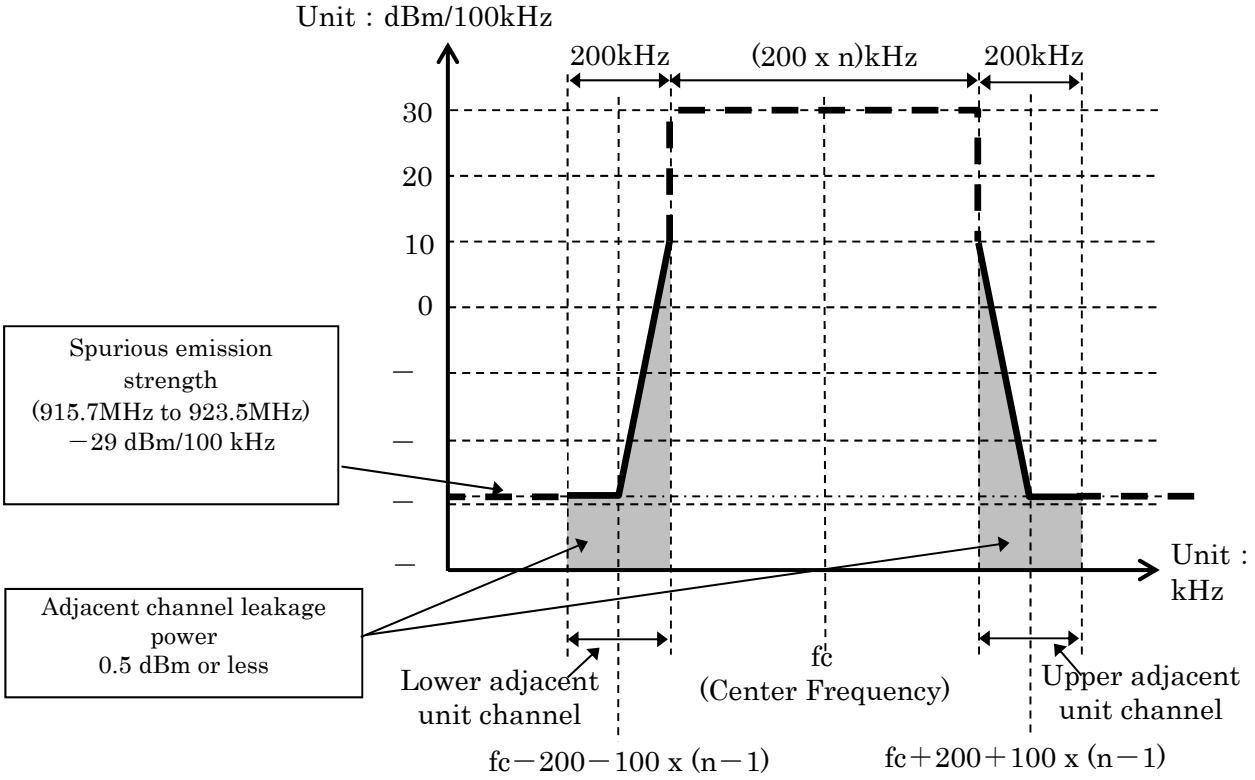
(7) Adjacent channel leakage power (ORE: article 49-9)

A. Spectral power at the both edges of a radio channel

It shall be 10 dBm or less, respectively.

B. Leakage power in a unit radio channel adjacent to a radio channel (200 kHz)

It shall be 0.5 dBm or less, respectively.



(Note: Center frequency is one of frequencies shown in Table 3-1 to Table 3-4 of this section, where n is the number of unit radio channels constructing one radio channel for simultaneous use. n = 1, 2, 3)

Figure 3-1 Image of channel mask of a radio channel.

(8) Permissible values for Spurious Emission/Unwanted Emission Intensity

(ORE: article 7, Attached table No.3-24)

(Ministerial ordinance of MIC No.162, 2011)

Spurious emission/Unwanted emission intensity at the antenna input shall be less than the value in Table 3-5.

Table 3-5 Permissible Values for Unwanted Emission Intensity (Antenna input)

Frequency band	Permissible Value for Spurious Emission / Unwanted Emission Intensity (average power)	Reference bandwidth
f ≤ 710 MHz	−36 dBm	100 kHz
710 MHz < f ≤ 900 MHz	−58 dBm	1 MHz
900 MHz < f ≤ 915 MHz	−58 dBm	100 kHz
915 MHz < f ≤ 915.7 MHz 923.5 MHz < f ≤930 MHz	−39 dBm	100 kHz
915.7 MHz < f ≤ 923.5 MHz (except for |f-fc| ≤ 100x(n+1)kHz)	−29 dBm	100 kHz
930 MHz < f ≤ 1000 MHz	−58 dBm	100 kHz
1000 MHz < f ≤ 1215 MHz	−48 dBm	1 MHz
1.215 GHz < f	−30 dBm	1 MHz

(Note: n is the number of unit channels used simultaneously in a radio channel.)

(9) Modulation signal

No modulation or data etc.

3.2.2 Receiver

(1) Limit on Secondary Radiated Emissions, etc. (ORE: article 24-15)

(Revised Ministerial ordinance of MIC No.162, 2011)

Limit on Secondary Radiated Emissions, etc. shall be value in Table 3-6 or less.

Table 3-6 Limit on Secondary Radiated Emissions, etc.

Frequency band	Limit on Secondary Radiated Emissions, etc. (Antenna input)	Reference bandwidth
f ≤ 710 MHz	−54 dBm	100 kHz
710 MHz < f ≤ 900 MHz	−58 dBm	1 MHz
900 MHz < f ≤ 915 MHz	−58 dBm	100 kHz
915 MHz < f ≤ 930 MHz	−54 dBm	100 kHz
930 MHz < f ≤ 1000 MHz	−58 dBm	100 kHz
1000 MHz < f ≤ 1215 MHz	−48 dBm	1 MHz
1215 MHz < f	−47 dBm	1 MHz

(2) Reception from a responder (ORE: article 49-9)

Receiver shall be capable of receiving a radio wave from a responder.

3.2.3 Controller

Controller shall have equipment and functions that comply with the conditions specified in the section described below, except for the case of using the unit radio channel specified in 3.2.1 (3) Table 3-2.

(1) Transmission time control equipment (ORE: article 49, NT: No.407, 2008)

The controller shall cease emission of radio waves within 4 seconds after starting of emission. It shall pause emission for 50 ms or more until the next emission.

(2) Carrier sense (ORE: article 49, NT: No.407, 2008)

Controller shall have functions that comply with the conditions A, B and C specified below.

A. Carrier sense level

When the amount of the received power at the antenna input is -74 dBm or more, the controller shall prohibit transmission of radio wave in the same channel of the received power.

B. Bandwidth of carrier sense

The receiving bandwidth for carrier sense shall be the same bandwidth of its transmitting radio channel. In this regulation, emission shall be prohibited when the carrier sense level on the intended radio channel is more than -74dBm(200 kHz x n) at the antenna input. (Note: n is the number of the unit radio channels used

simultaneously in a radio channel. n=1, 2, 3.)

C. Carrier sense time

Time duration shall be more than 5 ms to detect whether the intended radio channel is open or not.

In this regulation, time duration is calculated as follows:

Time ≥ 5 + (R x 0.5) ms, where R is a random integer from 0 to 10.

3.2.4 Cabinet (ORE: article 49-9)

The high frequency circuit and modulation modules except for antenna shall be structured not to be opened easily.

3.3 Interface between Data processing unit and Radio equipment

Not specified.

3.4 Antenna (ORE: article 49-9)

Antenna gain 6 dBi or less (absolute gain)

Provided that measured EIRP (Equivalent Isotropically Radiated Power) is less than the value of 6dBi plus 1W of antenna power, it is allowed to fill in the gap by the antenna gain.

3.5 Responder (ORE: article 24-14)

Responder shall be activated and operated by receiving RF power from an interrogator and return all or some portion of its received power to the interrogator as the same frequency radio wave.

Chapter 4 Compliance of radiation protection

(RERL article 21-3)

Signal intensity means electric field strength, power flux density and magnetic field strength (hereinafter the same)..It is set forth as that the place at which the signal intensity coming from radio equipment exceeds the value shown in table 4-1, protection facilities are required to guard person who are there except for operator.

(RERL attached table 2-3-2)

Table 4-1 Reference value of electromagnetic field strength (RERL article 21-3-5)

Frequency	Electric field strength (V/m)	Magnetic field strength (A/m)	Power flux density (mW/cm^2)	Average Time (minute)
More than 300 MHz and less than 1.5 GHz	$1.585\ f^{1/2}$	$f^{1/2}／237.8$	$f／1500$	6

Note1: Unit of f is in MHz.

Note2: Electric field strength and Magnetic field strength should be filled in effective values.

On the other hand, power flux density S (mW/cm^2) at a distance of R (m) from an antenna is calculated using the following formula. (NT: No.300,1999)

$$S = (PG)/(40\pi R^2)\cdot K$$

where P(W): Antenna power

G : Antenna gain (absolute gain)

K : Coefficient of reflection

a) No reflection K = 1

b) Taking account of the refection from the ground K = 2.56

(Transmission Frequency ≥ 76 MHz)

c) In case of strong reflection is considered due to obstacles such as buildings, steel towers, metallic objects, 6dB shall be added to the calculated value.

$$K = 2.56\times10^{6/10} = 10.2$$

The threshold value of compliance of radiation protection at 918.8MHz is calculated by the following formula as power flux density S.

$$S = f/1500 = 918.8/1500 = 0.613\ (mW/cm^2)$$

Therefore a limited distance R for above power flux density S is given by the following formula.

$$R = (PGK/40\pi S)^{1/2}$$

The example of calculation results of limited distance R in case of antenna power P= 1W, antenna gain G=6dBi (absolute gain) are shown in Table 4-2.

Table 4-2 Example of calculation results of the limited distance by radiation protection guideline

Reflection circumstances	Coefficient of reflection **K**	The limited distance of radiation protection guideline **R**
No-reflection	1	0.228 m
From the ground	2.56	0.365 m
From buildings towers, something of metal that has possibility to make strong reflection.	10.2	0.728 m

It is noted, that in the actual case for calculating a limited distance according to the radiation protection guideline, uncertain factors which may cause especially strong reflections such as layout and structure in the vicinity of the actual point (operation site) for calculation must be considered, and necessary measures corresponding to the actual point must be taken. However, movable radio equipment, and temporary installed radio equipment for emergency such as a typhoon and an earthquake, are excluded from the radiation protection guideline under RERL article 21-3.

Depending on the operation of RFID equipment for Premises radio station, each system parameter should meet the radiation protection guideline requirements. Also, if there is any area in the vicinity of the antenna where the radiation protection guideline is not satisfied, it is required, for example, to provide a safety fence.

Chapter 5 Measurement methods

Method of measurement of this system shall be based on OTRCC attached table 1-1-(3) (Note) or an equivalent or exceeding method of measurement. For other test item which is not specified as test item in the above document, general method of measurement shall be applied.

(Telecom Engineering Center (TELEC) Foundation has established "TELEC-T240: Method of measurement for Radio equipment for Premise Radio Station using the frequency of 916.7MHz and more to 920.9MHz or less", based on NT No.88-2, January 16th, 2004 of MIC according to OTRCC attached table 1-1-(3).)

Note: NT No. 88 dated 2004/1/16 was applied in this ARIB Standard Ver.1, when it was settled in February 14th 2012 unless otherwise stated. If any revision is added, it shall be effective in accordance with its procedures.

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Annex　Operational rule

1　Overview

1.1　Purpose

These guidelines aim to avoid undesired interference to other neighboring wireless systems, to effectively utilize frequency resource and to guarantee user's convenience when a user operates 920MHz-band premises radio station of RFID (referred to as "Premises Radio Station" in the following hereinafter).

1.2　Scope of application

These guidelines apply to users of Premises Radio Station and vendors who manufacture, sell, install, oparate and maintain　premises radio stations .

1.3　Target systems

These guidelines target following systems.

- 920 MHz-band RFID equipment for Premises Radio Station: ARIB STD-T106.

There are interrogators defined by ARIB STD-T106, which correspond to two types of radio stations as follows:

- Registered Radio Station

  Interrogator operable only with transmission time control and carrier sense.
- Licensed Radio Station

  Interrogator operable without transmission time control or carrier sense. In the case of operation with transmission time control and carrier sense by the interrogator which can be operable without transmission time control or carrier sense, this interrogator is considered as Licensed Station.

2　Interference avoidance method

2.1　Channel assignment

In addition to the radio station specified by this standard (STD-T106), in 920MHz band,

radio stations targeted in this standard share same frequencies specified by STD-T107 and STD-T108. These radio stations have different output powers and carrier sense conditions, so that they have the following relationships of causing/subjecting to interference.

STD-T106 Premises Radio Station, Interrogator corresponding to Licensed station
> STD-T106 Premises Radio Station, Interrogator corresponding to Registered station
> STD-T107 Radio equipment for Specified Low Power Radio Station and
STD-T108 Radio equipment for convenience/Specified Low Power Radio Station
> STD-T106 Premises Radio Station, Responder corresponding to Licensed station.

Considering the above situation, a channel plan for each radio station specified by STD-T106 and STD-T107 is shown in Table S-1. In particular, with respect to UHF band RFID equipment using 920 MHz band, applications using high-speed data communications are expected to increase from now on, so that ARIB STD has established countermeasures as shown in Table S-1 for avoiding interference with other radio stations by ensuring wide signal region for a responder using subcarrier scheme corresponding to a licensed radio station, and by assigning available channel with priority to all the radio stations.

A licensed Premises Radio Station preferentially uses channel 5, 11 and 17. Use of Channel 23 is abstained in consideration for interference with registered Premises Radio Station and Specified Low Power Radio Station.

A registered Premises Radio Station preferentially uses channels 23, 24 and 25. These channels can be used as a single channel or bonding of two or three channels. Channels 5, 11 and 17 may be used on the precondition that there would be interference with licenced Premises Radio Station.

For reference, Specified Low Power Radio Station specified by ARIB STD-T107 preferentially uses channels 26, 27, 28, 29, 30, 31 and 32. These channels can be used as a single channel or bonding of two to five channels. Channels 23, 24 and 25 may be used on the precondition that there would be interference with registered Premises Radio Station. These channels can be used as a single channel or bonding of two to five channels combined with channels 26 to 29 on the precondition that there would be interference with registered Premises Radio Station.

Channel 33, 34, 35, 36, 37, and 38 can be used according to transmission time control equipment and carrier sense of the channels which are specified in "920 MHz Telemeter, Telecontrol and Data Transmission Radio Equipment" (ARIB STD-T108 part II, 3.4.1 excluding (3), and 3.4.2 excluding (4)).

When operating an interrogator for a licensed radio station which has no interference avoiding technology (transmission time control equipment and carrier sense), from the view point of sharing with an interrogator corresponding to a registered radio station which has interference avoiding technology, it is desired to affirm beforehand the presence of radio waves in channel 5, 11, 17 and 23 by an spectral analyzer before installation, and to operate the interrogator with an electromagnetic shield having shielding material if necessary in order to avoid interference with the existing registered radio station.

Also, depending on the conditions, such a case may be assumed that an interrogator (channel 5,11,17 and 23) corresponding to licensed radio station without interference avoiding technology, cannot be operated, so that it can be considered to have two types of operations in the equipment: one is provided with interference avoiding technology and the other is not provided with interference avoiding technology and to operate by switching between them depending on the conditions.

Table S-1 Channel plan for "920 MHz-band RFID equipment for Premises Radio Station" and "920 MHz-band RFID equipment for Specified Low Power Radio Station" (Note 1)

Center frequency (MHz)	Channel number	Premises Radio Station		Specified Low Power Radio Station (Note 2)
		Licensed	Registered	
		1W	1W	250 mW
916.0	1			
916.2	2			
916.4	3			
916.6	4			
916.8	5	◎	○	○
917.0	6			
917.2	7			
917.4	8			
917.6	9			
917.8	10			
918.0	11	◎	○	○
918.2	12			
918.4	13			
918.6	14			
918.8	15			
919.0	16			
919.2	17	◎	○	○
919.4	18			
919.6	19			
919.8	20			
920.0	21			
920.2	22			
920.4	23	△	◎	○
920.6	24		◎	○
920.8	25		◎	○
921.0	26			◎
921.2	27			◎
921.4	28			◎
921.6	29			◎
921.8	30			◎
922.0	31			◎
922.2	32			◎
922.4	33			△A
922.6	34			△A
922.8	35			△A
923.0	36			△A
923.2	37			△A
923.4	38			△A

(Note1):

Blank:		Channel prohibited for use
△	:	Abstain from using these channels for consideration of effecting to other systems
△A	:	Available channel according to transmit time control equipment and carrier sense in ARIB STD-T108 Part II 3.4.1 except (3) and ARIB STD-T108 Part II 3.4.2 except (4)
	:	Available channel for preferential use
○	:	Available channel on the precondition that there would be interference with Premises Radio Stations

(Note2): The threshold level of carrier sense shall be -64dBm for a radio station which has antenna power output less than 10mW.

2.2 Interference to aeronautical radio systems

Electronic equipment that is prohibited from being activated on an aircraft to maintain the safety of the aircraft pursuant to the provisions of Civil Aeronautics Act and falls under the radio stations specified in this standard shall have either of the following structures if it is to be carried on an aircraft:

- The equipment shall be deactivated by removing its batteries or being switched off
- The equipment shall have a structure such that it cannot be activated without being switched on.

However, it is not necessary for radio equipment which is assessed using the test procedures described in DO-294 published by the RTCA and confirmed to be free from the risk of interference to have the above-mentioned structures.

Related laws and regulations:

- Civil Aeronautics Act, Article 73-4
- Ordinance for Enforcement of the Civil Aeronautics Act, Article 164-15: Safety impending acts etc.
- Notification No. 1346 of Ministry of Land, Infrastructure, Transport and Tourism (2003): Electronic Devices prohibited for use at all times

3 Influence to medical equipment

To avoid the influence to medical equipment, it is desirable to act properly according to the guideline of action described in “Study Report on the Effect of Radio Waves on Medical Devices” (Note 3).

(Note 3): When issuing version 1.0 of this standard (14th February, 2012), it indicates the report issued by MIC on March, 2007. However, when it is revised, it indicates the latest version.

4 Protection of privacy

For protection of privacy, it is desirable to act properly according to "Guidelines for Privacy Protection with Regard to RFID Tags" (Note 4).

(Note4): When issuing version 1.0 of this standard (14th February, 2012), it indicates the guideline issued by MIC and METI on 8th June, 2004. However, when it is revised, it indicates the latest version.

5 Channel plan for 920MHz-band radio equipment

Figure S-1 shows Channel allocation for 920 MHz-band Telemeter, Telecontrol and Data Transmission Radio Equipment for convenience radio stations and Specified Low Power Radio Stations (Active tag system) and 920 MHz-band RFID equipment for Premises Radio Stations and Specified Low Power Radio Stations (Passive tag system).

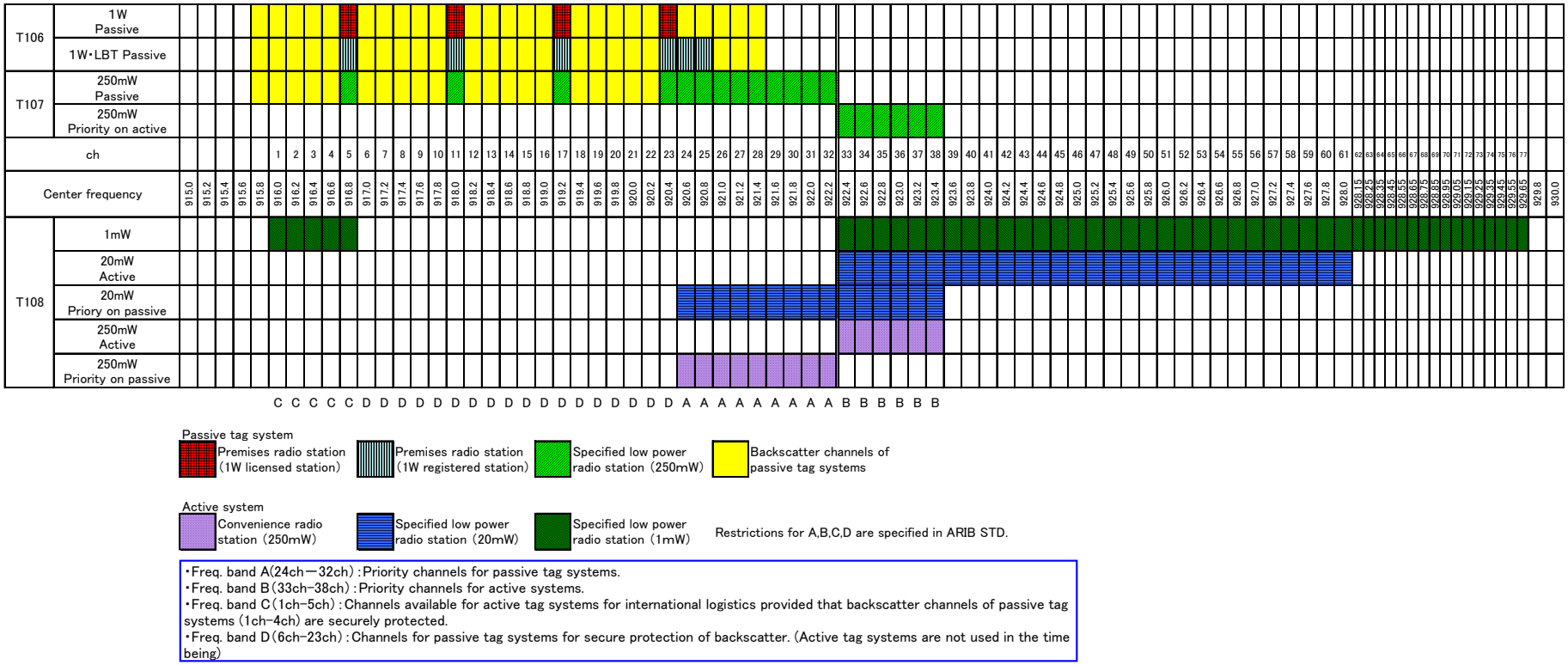

Figure S-1 Channel plan for 920MHz-band radio equipment

To: Secretariat of Standard Assembly Meeting of the Association of Radio Industries and Businesses
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ARIB Standard Name (No.)	**920MHz-BAND RFID EQUIPMENT FOR PREMISES RADIO STATION (ARIB STD-T106)**		
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