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RCR STD-28

PERSONAL HANDY PHONE SYSTEM

ARIB STANDARD

VERSION 2

RCR STD-28

Version 1	December	20th	1993
Version 1 Rev.-1	March	3rd	1995
Version 2	December	26th	1995

Association of Radio Industries and Businesses (ARIB)

IPR2023-01416
Petitioners' Ex. 1009
Ex.1009.00001

PERSONAL HANDY PHONE SYSTEM ARIB STANDARD

INTRODUCTION

The Association of Radio Industries and Businesses (ARIB) has been investigating and summarizing the basic technical requirements for establishing standards for developing a digital mobile telephone system. These will appear in the form of standards and specifications governing the use of radio facilities and equipment for systems that transmit over radiowaves. The standards are being developed based on the participation of and discussions with the various radio equipment manufacturers, operators and users.

The standards and specifications contained herein will serve as guidelines for developing standards for private use based on the publicly established technical standards in Japan. Their purpose is to enable effective use of radio frequencies by avoiding interference among users, conflicts among the standards of individual operators, and so forth, so that all parties involved, including radio equipment manufacturers, users and others will be able to ensure the quality and compatibility of radio facilities and equipment.

These standards are being established principally for "Personal Handy Phone System Radio Interfacing". In order to ensure fairness, impartiality and openness among all parties involved, during the drafting stages, we invite radio equipment manufacturers, telecommunications operators and users both domestically and overseas to participate openly in the activities of the Standards Committee so as to develop standards with the total agreement of all parties involved.

The scope of application of these standards covers the minimum requirements for communications. They are designed to serve as practical guidelines for telecommunications equipment operators in developing original specifications and systems that fall within the scope of the standards.

We hope that the standards will aid all parties involved, including radio equipment manufacturers, telecommunications operators, users and others in the development of an excellent radio telecommunication system.

Note : Although this ARIB Standard contains no specific reference to any Essential Industrial Property Right relating thereto, the holder of such Essential Industrial Property Right states that "YYY" is the holder of the Industrial Property Right "XXX" covering this ARIB Standard and agrees not to assert such right "XXX" and to grant a license unconditionally to the use of such right "XXX" to anyone using this ARIB Standard. However this does not apply to anyone who uses this ARIB Standard and also owns and lays claim to any other Essential Industrial Property Right whose scope is included in any or all parts of the contents of the provisions of this ARIB Standard.

General notes for the ARIB standard in English version:

The rights of copying and distribution for these materials are ascribed to the Association of Radio Industries and Businesses (ARIB).

The original "Personal Handy Phone System ARIB standard Version 2 (RCR STD-28)" is written in Japanese and approved by the 3rd Standard Assembly Meeting December 26, 1995. This document is the translation of the standard into English.

The note about IPR (Industrial Property Rights) in the INTRODUCTION of this document applies to the use of Essential IPR for the ARIB standard in Japan. If the ARIB standard is adopted outside Japan, Essential IPR will be treated in accordance with policies stated by each IPR owner. The IPR owners are, however, expected to apply the rules of the preface of the "Guidelines for Treatment of Industrial Property Rights in connection with the ARIB Standard" (September 5, 1995, approved by the 1st Standard Assembly Meeting). The preface of these guidelines states that it is "desirable that the Essential IPR which relates to any or all parts of the contents of the ARIB standard should be used free of charge by anyone and that it would not block the use of such Essential IPR in any other country where such an ARIB Standard is adopted".

Attached Table

Patent Applicant	Title of invention		Application No. and Publication No.	Remarks
	(1)	(2)		
Sony Corporation Telefonaktiebolaget L M Ericsson	(1) Digital cordless telephone equipment		Publication No. 92-213933	Application in U.S., Germany, Great Britain, France, Sweden, Australia, Aus., Neth., Swiss, Den., Nor., Fin. and Braz.
	(1) Equipment for transmission of telephone calls to a portable, wireless telephone set		Application No. 94-14361 (utility model)	
	(2) Installation with portable, wireless telephone sets		Publication No. 87-502841 PCT/SE86/00210	Application in U.S., Germany, Great Britain, France, Italy, Sweden, Australia, Neth., Swiss, Den., Nor., and Fin.
Toshiba Corporation NEC Corporation	(1) Private communication method		Publication No. 86-54750	Application in U.S., Canada, Germany, Great Britain, Sweden and Australia
	(1) Radio communication equipment		Public notice (note 1) No. 90-052464	
Nippon Telegraph and Telephone Corporation (NTT)	(1) Radio channel assignment method		Publication No. 92-111544	Application in U.S., Germany, Great Britain and Sweden
	(2) Communication channel designation method		Publication No. 92-373327	
	(3) Control channel standby method		Publication No. 92-373323	
	(4) Mobile communication radio control channel structure method		Publication No. 91-104428	
	(5) Mobile communication method		Publication No. 90-7633	
Fujitsu Limited	(1) Radio communication method		Publication No. 88-294150	Application in U.S., Germany, Great Britain, France and Italy
Mitsubishi Electric Corporation	(1) Frame synchronization control equipment		Publication No. 93-48513	

(Note1) Publication after examination.

About description methods in this document

- In Chapters 1 through 7, regulations/standards and their corresponding measurement methods are described.
- In Chapter 8, basic terminology is explained to aid understanding of this document.
- In the appendices, descriptions of the regulations/standards of Chapters 1-7 are described to aid understanding. The described items of the appendices have the same effect as the regulations/standards.
- The attachments describe regulations/standards that can be disclosed according to disclosure procedure regulations.
- To clarify the classifications of private/public in the standard, the following markings are attached to the right side of each chapter and section.

Also, the marking of "Private mandatory" and/or "Public mandatory" are attached occasionally to the right of subheading in each section.

Private mandatory Private system mandatory standardization object item (forced standard)

Private standard Private system standardization object item

Private reference Private system object reference item

Public mandatory Public system mandatory standardization object item (forced standard)

Public standard Public system standardization object item

Public reference Public system object reference item

Reference Private/public reference item

Standard Standardized items for overseas private/WLL systems

- ARIB was formerly called as RCR

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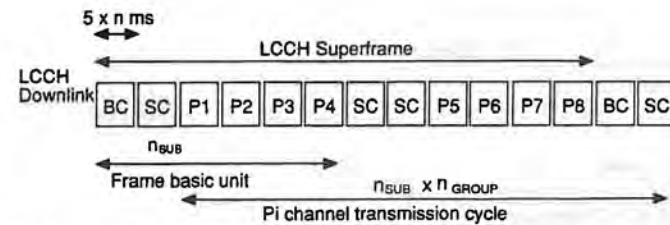
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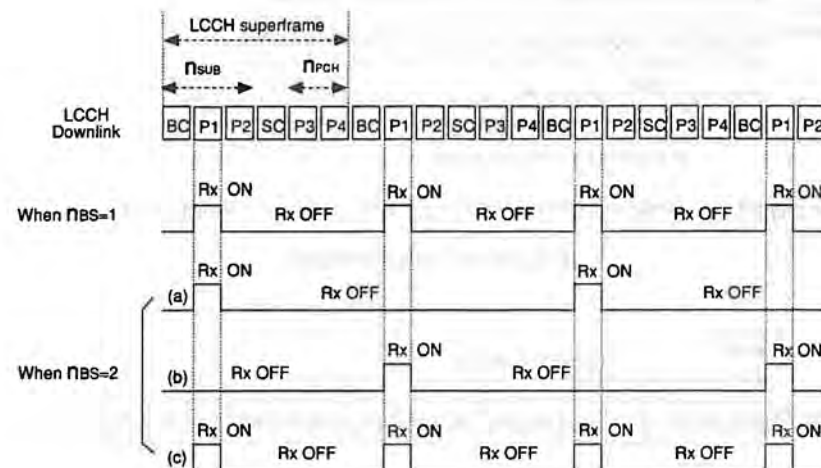
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• In the above diagram, the example is shown with $n_{SG} = 1$, $n_{SUB} = 6$, $n_{PCH} = 4$, $n_{GROUP} = 2$.

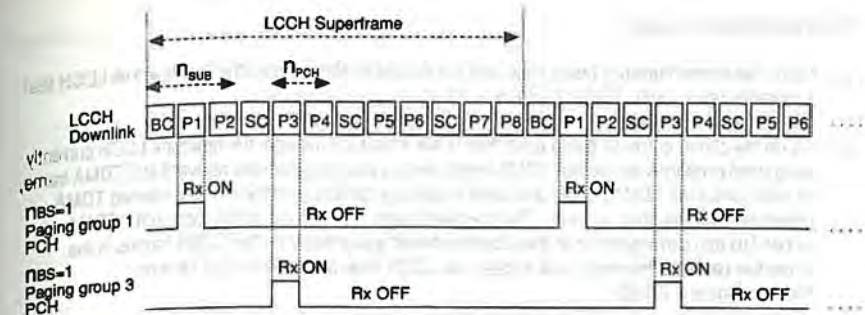
(d) Superframe structure example 4

Figure 4.2.5 Superframe structure example



• In the diagram above, the example is shown with $n_{SG} = 1$, $n_{SUB} = 3$, $n_{PCH} = 2$, $n_{GROUP} = 2$.

Figure 4.2.6 Paging group P1 battery saving method



• In the diagram above, the example is shown with $n_{SG} = 1$, $n_{SUB} = 3$, $n_{PCH} = 2$, $n_{GROUP} = 4$.

Figure 4.2.7 Paging group P1/P3 battery saving method

4.2.7.3 Uplink logical control channel structure

(Private standard/Public standard)

Figure 4.2.8 shows an example of standard structure for the uplink logical control channel (LCCH). The LCCH uplink performs random access with slotted ALOHA, and it is sent from each PS only when needed. As a standard, 5 classes can be designated for the control physical slot positions that can be transmitted from PS, and these are informed from CS to PS according to the radio channel information broadcasting message on BCCH. (Refer to section 4.3.4.2.1.)

Specifically, the uplink LCCH position (slot position) is specified as follows according to the number of LCCHs used by one CS. However, if two LCCHs are used, in a private system, this indicates the case where 2 control carriers are used; in a public system, this indicates the case where two LCCHs are constructed on one control carrier. (Refer to section 4.2.7.5.)

[For 1 control carrier wave]

- (1) It is on the carrier currently being used and it is the uplink slot 2.5 ms after the downlink LCCH that is currently being used. (Refer to Figure 4.2.8 (a))
- (2) It is on the carrier currently being used and it is the uplink slot every 5 ms corresponding to the TDMA slot 2.5 ms after the downlink LCCH that is currently being used. (Refer to Figure 4.2.8 (b))

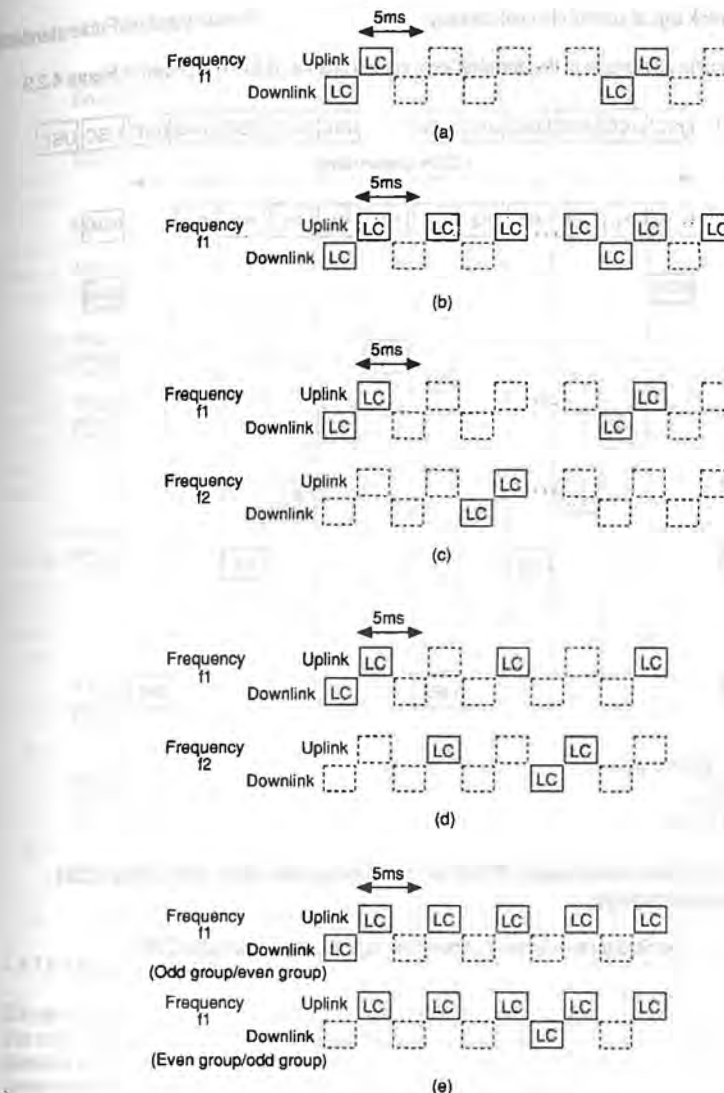
[For 2 control carrier waves]

- (1) It is on the carrier currently being used and it is the uplink slot 2.5 ms after the downlink LCCH that is currently being used. (Refer to Figure 4.2.8 (c))
- (2) It is on the carrier currently being used; the TDMA frame 2.5 ms after the downlink LCCH currently being used is defined as the first TDMA frame, and by counting from the relevant first TDMA frame, the odd-numbered TDMA frames allocate the relevant carriers, and the even-numbered TDMA frames allocate the other carriers. The specified uplink LCCH is the uplink slot each 2 TDMA frames (10 ms) corresponding to the aforementioned assignment on the TDMA frames in the respective carriers. However, in this case, the LCCH interval value (n) must be even. (Refer to Figure 4.2.8 (d))
- (3) It is on the carrier currently being used; and is the uplink slot every 5 ms corresponding to the TDMA slot 2.5 ms after the downlink LCCH presently being used. (Refer to Figure 4.2.8 (e))

However, the uplink LCCH position (slot position) is as follows.

Handover: Uplink timing of LCCH superframe which transmitted first link channel establishment request message.

Otherwise: Uplink timing of LCCH superframe that agrees with own paging group.
LCCH signals must not be transmitted at different timing of LCCH superframe when retry sequence is activated in the above both cases. This mode is used only in a public system.



- In (a) – (d), SCCH or USCCH (option) can be transmitted as the uplink LCCH.
- In (e), only SCCH can be transmitted as uplink LCCH.

Figure 4.2.8 Structure example of uplink logical control channel (LCCH)

4.3 Link channel establishment phase (Private standard/Public standard)

4.3.1 Overview (Private standard/Public standard)

In this section, the signal formats and the regulations on protocol needed for the link channel establishment phase are specified. Further, the standard formats using BCCH, PCH as well as SCCH specified in the former section are mandatory, and anything else is not especially specified and is an option.

4.3.2 General regulations (Private standard/Public standard)

4.3.2.1 Protocol regulations (Private standard/Public standard)

These are as follows.

- (1) The message is completed for each single physical slot.
- (2) Because this phase does not use layer structure, layer 2 with transmission acknowledgment and error recovery function does not exist. Accordingly, the header element that corresponds to layer 2 functions is not included.
- (3) The total number of link channel establishment request retries, link channel establishment re-request and link channel establishment re-request retries is a maximum of 3 in the same outgoing call (including recalling-type handover), incoming call or location registration operation.

4.3.2.2 Format rules (Private standard/Public standard)

(1) Octet transmission order

The transmission order of the octet within the message format is in order from octet 1, octet 2, octet 3...

(2) Bit transmission order

The transmission order for bits within the octet is in order from bit 1, bit 2, bit 3...

4.3.2.2.1 Rules about unused elements (Private standard/Public standard)

The rules pertaining to unused elements of the message contents and information element explanations in the messages are as follows.

- Reserved : This is the area saved for extension. Usage against this standard is not permitted.
 Unless otherwise specified, the transmission side transmits "0".
 When an old-version equipment receives a bit other than "0" in a reserved area of the old version, it must ignore the bit and act as if the bit is "0".
- Option : This is the area where the method of use is optional.
- : This means that the same bit value shown below in the table is inserted.
- X : Don't care

4.3.4 Message format (Private standard/Public standard)

4.3.4.1 Channel setup messages (Private standard/Public standard)

4.3.4.1.1 Idle (Private standard/Public standard)

In downlink SCCH timing, only when there is no significant signal to be transmitted, this message can be transmitted. In the relevant message, the called station identification code and information elements are all "0". The message format is shown in Table 4.3.8.

Table 4.3.8 Idle message

Message type : Idle
Direction : CS → PS (downlink)
Function channel : SCCH

Octet \ Bit	8	7	6	5	4	3	2	1
1	Re-served	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5							0	0

4.3.4.1.2 Link channel establishment request (Private standard/Public standard)

The PS carries out link set up request to CS using this message. The link set up request is only possible from PS to CS. PS designates the link channel (LCH) type needed for communication and the call connection protocol type and transmits the link channel establishment request to CS. The message format is shown in Table 4.3.9 and the explanation of each information element is shown in Table 4.3.10.

Table 4.3.9 Link channel establishment request message

Message type : Link channel establishment request
Direction : PS → CS (uplink)
Function channel : SCCH

Octet \ Bit	8	7	6	5	4	3	2	1
1	Re-served	0	0	0	0	0	0	1
	Message type							
2	LCH type			LCH protocol type		Extension LCH protocol type		
3	CC protocol type		System type			RT-MM protocol version		
4	Reserved					Area information notification status number		
5							Option	

Table 4.3.10 Information elements in link channel establishment request message

LCH type (octet 2)

Bit	7	6	
8	0	0	Standard (32 kbit/s)
0	0	1	Reserved (16 kbit/s)
0	0	0	Reserved (8 kbit/s)
0	1	0	Reserved (32 kbit/s + 16 kbit/s)
0	1	1	Reserved
1	0	0	Reserved
1	0	1	Option (private)/reserved (public)
1	1	0	Option (private)/reserved (public)
1	1	1	Option (private)/reserved (public)

LCH protocol type (octet 2)

Bit	5	4	
0	0	0	Standard (service channel used) (note 1)
0	1	0	Standard (service channel not used) (note 2)
1	0	0	Reserved
1	1	1	Option (private)/reserved (public)

(Note 1) Used when a procedure with the communication phase is requested, such as in the case of activation of the call origination and reception sequence.

(Note 2) Used when a procedure without the communication phase is requested, such as in the case of activation of the location registration sequence.

Extension LCH protocol type (octet 2)

If reserved (1 0) or (1 1) was set in the LCH protocol type (octet 2), all areas of this element become reserved. If optional (1 1), all areas are optional.

If the LCH protocol type is standard (0 0) or standard (0 1), it becomes as follows.

Bit	2	
0	0	RT function request absent
1	1	RT function request present

Bit	1	
0	0	MM function request absent
1	1	MM function request present

All other areas are reserved.

RT/MM function request absent: Notifies that RT/MM function request is not transmitted in service channel establishment phase.

RT/MM function request present: Notifies that RT/MM function request is transmitted in service channel establishment phase.

CC protocol type (octet 3)

When standard (0 1), reserved (1 0) or reserved (1 1) is set in the LCH protocol type (octet 2), this element is all reserved. If option (1 1) is set, all areas are optional.

If the LCH protocol type is standard (0 0), it is as follows.

Bit		
8		
0	Dial signal en-bloc transmission	
1	Dial signal overlap transmission (reserved in public system)	

All other areas are reserved.

Dial signal en-bloc transmission : Requests that the dial signal is en-bloc transmitted by SETUP.
Dial signal overlap transmission : Requests that the dial signal is overlap transmitted by INFORMATION.

System type (octet 3)

Shows the system type required by a PS.

Bit				
6	5	4		
0	0	0	Public system (including private system based on RCR STD-28 (version 1) or RCR STD-28 (version 1 Rev.-1))	
0	0	1	Private system based on RCR STD-28 (version 2)	
0	1	0	System type 3 (reserved)	
1	1	1	System type 8 (reserved)	

RT-MM protocol version (octet 3)

Shows the RT-MM protocol version held by PS.

Bit				
3	2	1		
0	0	0	Version 1 (RCR STD-28 (version 1) or RCR STD-28 (version 1 Rev.-1))	
0	0	1	Version 2 (RCR STD-28 (version 2))	
0	1	0	Version 3 (reserved)	
1	1	1	Version 8 (reserved)	

Area information notification status number (octet 4)

This element indicates that PS does not hold the area information, or it indicates the notification-status number of the area information which the PS holds.

Bit				
3	2	1		
0	0	0	Does not hold area information	
0	0	1	Status number 1	
1	1	1	Status number 7	

4.3.4.1.3 Link channel assignment (Private standard/Public standard)

After there is a link channel establishment request from PS, CS uses this message to perform channel assignment in response to PS. Further, before this message is transmitted, CS needs to confirm that it is possible to provide the LCH protocol type and LCH type that are requested by PS. The message format is shown in Table 4.3.11 and the explanation of each information element is shown in Table 4.3.12.

Table 4.3.11 Link channel assignment message

Message type : Link channel assignment
Direction : CS → PS (downlink)
Function channel : SCCH

Octet \ Bit	8	7	6	5	4	3	2	1
1	Re-served	0	0	0	0	0	0	1
2	LCH type			Reserved		Extension LCH protocol type		
3	CC protocol type		Re-served	Relative slot number				
4	Carrier number n_i							
5								Absolute slot number

Table 4.3.12 Information elements in link channel assignment message

LCH type (octet 2)

Bit	8	7	6	
0	0	0	0	Standard (32 kbit/s)
0	0	0	1	Reserved (16 kbit/s)
0	1	0	0	Reserved (8 kbit/s)
0	1	1	1	Reserved
1	0	0	0	Reserved
1	0	1	1	Reserved
1	1	1	0	Option (private)/Reserved (public)
1	1	1	1	Option (private)/Reserved (public)

Extension LCH protocol type (octet 2)

If reserved (1 0) or reserved (1 1) is set in the LCH protocol type (octet 2) of the link channel establishment (re) request message, all areas are reserved. If set to option (1 1), all areas are optional.

If the LCH protocol type is standard (0 0) or standard (0 1), it is as follows.

Bit	3	
0		Notification information reception indication absent
1		Notification information reception indication present

Bit	2	
0		RT function request absent
1		RT function request present

Bit	1	
0		MM function request absent
1		MM function request present

Notification information reception indication absent: PS cannot request notification information from CS by definition information request message in service channel establishment phase.

Notification information reception indication present: PS must request notification information from CS by definition information request message in service channel establishment phase.

RT/MM function request absent: RT/MM function request may not be transmitted in service channel establishment phase.

RT/MM function request present: RT/MM function request must be transmitted in service channel establishment phase.

CC protocol type (octet 3)

This element is all reserved when standard (0 1) or reserved (1 0) or reserved (1 1) is set in the LCH protocol type (octet 2) of the link channel establishment (re) request message. If option (1 1) is set, all areas are optional.

When the LCH protocol type is standard (0 0), it is as follows.

Bit	8	
0		Dial signal en-bloc transmission
1		Dial signal overlap transmission (reserved in public system)

Otherwise, all regions are reserved.

Dial signal en-bloc transmission: Dial signal must be en-bloc transmitted by SETUP.

Dial signal overlap transmission: Dial signal can be overlap transmitted by INFORMATION.

Relative slot number (octet 3)

Bit	5	4	3	2	1	
0	0	0	0	0	0	Relative slot number = 1
0	0	0	0	0	0	Relative slot number = 2
1	1	1	1	1	1	Relative slot number = 32

(Note) For the relative slot number designation method, refer to section 4.2.8.

Carrier number n_i (octet 4)

Bit	8	7	6	5	4	3	2	1	(carrier number)
0	0	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	0	1	First carrier (1,895.15 MHz)
0	0	0	0	0	0	0	1	0	Second carrier (1,895.45 MHz)
0	1	0	0	1	1	0	1		Seventy-seventh carrier (1,917.95 MHz)
				Other					Reserved

Absolute slot number (octet 5)

Bit

2 1

0	0	Shows that the relevant link channel assignment message was transmitted on the 1st TDMA slot.
0	1	Shows that the relevant link channel assignment message was transmitted on the 2nd TDMA slot.
1	0	Shows that the relevant link channel assignment message was transmitted on the 3rd TDMA slot.
1	1	Shows that the relevant link channel assignment message was transmitted on the 4th TDMA slot.

(Note) If LCH type (octet 2) of the link channel establishment (re-) request message is standard (0 0), the TDMA slot number of the communications carrier is obtained by the following equation.

$$\text{TDMA slot number of communications carrier} = \{(\text{absolute slot number} + \text{relative slot number} - 2) \text{ MOD } 4\} + 1$$

4.3.4.1.4 Link channel assignment reject

(Private standard/Public standard)

CS uses this message to inform that channel setup is not possible in response to a link channel (re-)request from PS. CS can indicate the reject reason in this message, such as that there is no free radio channel, LCH protocol type or LCH type request cannot be satisfied, etc. The message format is shown in table 4.3.13, and the explanation of information elements is shown in table 4.3.14.

Table 4.3.13 Link channel assignment reject message

Message type : Link channel assignment reject
 Direction : CS → PS (downlink)
 Function channel : SCCH

Octet	Bit	8	7	6	5	4	3	2	1
1	Re-served	0	0	0	0	0	0	1	0
2	Message type								
3	Reject reason								
4	Reserved								
5	Option								
5									Option

Table 4.3.14 information elements of link channel assignment reject message

Reject reason (octet 2)

Bit	7	6	5	4	3	2	1	
8	0	0	0	0	0	0	0	Reserved
0	0	0	0	0	0	0	1	All CS slots in use
0	0	0	0	0	0	1	0	No CS free channel
0	0	0	0	0	0	1	1	No free outgoing line on wired side
0	0	0	0	0	1	0	0	LCH type disagreement
0	0	0	0	0	1	0	1	LCH protocol disagreement
0	0	0	0	0	1	1	0	Extension LCH protocol disagreement
0	0	0	0	0	1	1	1	CC protocol disagreement
0	0	0	0	1	0	0	1	Traffic restriction
0	0	0	0	1	0	1	0	Relevant CS use impossible (zone selection impossible)
0	0	0	0	1	0	1	1	RT-MM protocol version disagreement
0	0	0	0	1	1	0	0	Reserved
0	1	1	1	1	1	1	1	Reserved Option
	Other							

All CS slots in use:

Shows that in response to link channel establishment (re-)request transmitted by PS, CS has no resources (slots) that should be assigned.

No CS free channel:

Shows that in response to link channel establishment (re-)request transmitted by PS, CS does not have radio channel resources (traffic channels) that should be assigned.

No free outgoing line on wired side:

Shows that in response to link channel establishment (re-)request transmitted by PS, CS does not have resources on wired side(outgoing lines) that should be assigned.

LCH type disagreement:

Shows that CS does not have LCH type that can be used in common with the PS that transmitted the link channel establishment (re-)request.

LCH protocol disagreement:

Shows that CS does not have the LCH protocol (including system type) that can be used in common with the PS that transmitted the link establishment (re-)request.

Extension LCH protocol disagreement:

Shows that CS does not have the extension LCH protocol that can be used in common with the PS that transmitted the link establishment (re-)request.

CC protocol disagreement:

Shows that CS does not have the CC protocol that can be used in common with the PS that transmitted the link establishment (re-)request.

- Traffic restriction: Shows that because CS is under traffic restriction, the link channel cannot be assigned.
- Relevant CS use impossible (zone selection impossible): Shows that relevant CS cannot be used.
- RT-MM protocol version disagreement: Shows that CS does not have the RT-MM protocol version that can be used in common with the PS that transmitted the link channel establishment (re-)request.

4.3.4.1.5 Link channel establishment re-request (Private standard/Public standard)

After a link channel assignment message is received from CS, PS can use this message to halt the link channel establishment sequence and re-request CS for link channel establishment. The message format is shown in Table 4.3.15 and the explanation of information elements in Table 4.3.16.

Table 4.3.15 Link channel establishment re-request message

Message type : Link channel establishment re-request
 Direction : PS → CS (uplink)
 Function channel : SCCH

Octet \ Bit	8	7	6	5	4	3	2	1
1	Re-served	0	0	0	0	0	1	0
2	LCH type			LCH protocol type		Extension LCH protocol type		
3	CC protocol type		System type			RT-MM protocol version		
4	Cause					Area information notification status number		
5							Option	

Table 4.3.16 Information elements in link channel establishment re-request message

LCH type (octet 2)

Bit	8	7	6	
0	0	0	0	Standard (32 kbit/s)
0	0	0	1	Reserved (16 kbit/s)
0	1	0	0	Reserved (8 kbit/s)
0	1	1	1	Reserved (32 kbit/s + 16 kbit/s)
1	0	0	0	Reserved
1	0	1	1	Reserved
1	1	1	0	Option (private)/reserved (public)
1	1	1	1	Option (private)/reserved (public)

LCH protocol type (octet 2)

Bit	4	
5	0	Standard (service channel used)
0	1	Standard (service channel not used)
0	0	Reserved
1	1	Option (private)/reserved (public)

Extension LCH protocol (octet 2)

If reserved (1 0) or reserved (1 1) is set in the LCH protocol type (octet 2), all areas of this element become reserved. If option (1 1) is set, all areas are optional.

If the LCH protocol type is standard (0 0) or standard (0 1), it is as follows.

Bit	2
0	RT function request absent
1	RT function request present

Bit	1
0	MM function request absent
1	MM function request present

All other areas are reserved.

RT/MM function request absent: Notifies that RT/MM function request is not transmitted in service channel establishment phase.

RT/MM function request present: Notifies that RT/MM function request is transmitted in service channel establishment phase.

CC protocol type (octet 3)

This element is all reserved when standard (0 1) or reserved (1 0) or reserved (1 1) is set in the LCH protocol type (octet 2). When option (1 1) is set, all areas are optional.

When the LCH protocol type is standard (0 0), it is as follows.

Bit	8
0	Dial signal en-bloc transmission
1	Dial signal overlap transmission (reserved in public system)

Otherwise, all regions are reserved.

Dial signal en-bloc transmission: Requests that dial signal be en-bloc transmitted by SETUP.

Dial signal overlap transmission: Requests that dial signal be overlap transmitted by INFORMATION.

System type (octet 3)

Shows system type required by PS.

Bit	6	5	4	
0	0	0	0	Public system (including private system based on RCR STD-28 (version 1) or on RCR STD-28 (version 1 Rev.-1))
0	0	1	0	Private system based on RCR STD-28 (version 2)
0	1	0	0	System type 3 (Reserved)
1	1	1	1	System type 8 (Reserved)

RT-MM protocol version (octet 3)

Shows RT-MM protocol version held by PS.

Bit	3	2	1	
0	0	0	0	Version 1 (RCR STD-28 (version 1) or RCR STD-28 (version 1 Rev.-1))
0	0	1	0	Version 2 (RCR STD-28 (version 2))
0	1	0	0	Version 3 (reserved)
1	1	1	1	Version 8 (reserved)

Cause (octet 4)

Bit	8	7	6	5	4	
0	0	0	0	0	0	Reserved
0	0	0	0	0	1	Reserved
0	0	0	0	1	0	Reserved
0	0	0	0	1	1	Reserved
0	0	1	0	0	0	Reserved
0	0	1	0	0	1	Reserved
0	0	1	1	1	0	Assigned channel use not possible (shows that assigned channel cannot be used due to interference etc.)
0	0	1	1	1	1	Assigned channel non-corresponding PS (shows that it is not the radio station that corresponds to the assigned channel.)
0	1	0	0	0	0	Reserved
1	1	1	1	1	1	Reserved Option
			Other			

Area information notification status number (octet 4)

This element indicates that PS does not hold the area information, or it indicates the notification status number of the area information which the PS holds.

Bit	3	2	1	
0	0	0	0	Does not have area information
0	0	0	1	Status number 1
0	1	1	1	Status number 7

4.3.4.2 Broadcasting messages

(Private standard/Public standard)

4.3.4.2.1 Radio channel information broadcasting message

(Private standard/Public standard)

CS must broadcast the radio channel structure to PS using this message. The message format is shown in Table 4.3.17, and the information element explanations are shown in Table 4.3.18.

Furthermore, refer to section 4.2.7 for the relationship between the information elements of this message and the superframe structure.

Table 4.3.17 Radio channel information broadcasting message

Message type : Radio channel information broadcasting
 Direction : CS → PS (downlink)
 Function channel : BCCH

Octet \ Bit	8	7	6	5	4	3	2	1
1	Re-served	0	0	0	1	0	0	1
2	Message type							
3	LCCH interval value n^*							
4	Paging grouping factor n_{GROUP}^*					Paging area number length n_p^*		
5	Re-served	2nd system information broadcasting usage method* (reserved (note 3))	Number of same paging groups n_{SG}^*			Battery saving cycle maximum value n_{BS}^*		
6	offset		Number of PCHs n_{PCH}^*			Frame basic unit length n_{SUB}^*		
7	Absolute slot number		Broadcasting status indication			Uplink LCCH timing*		Control carrier structure
8			Option /Odd-even ID bit (note 2)	Option /Odd-even ID designation bit (note 2)	Global definition information pattern *			

(Note 1) Among the information elements of this message, those marked with a * are global definition information elements, and others are local definition information elements.

Annex1

Standard pertaining to authentication of personal handy phone system (public)

Caution:

Disclosure of the standard is according to the "Disclosure procedure rules of standard pertaining to authentication and subscriber data write-in of personal handy phone system (public)" specified by the standard committee.

Annex 2

Standard pertaining to subscriber data write-in of personal handy phone system (public)

Caution:

Disclosure of the standard is according to the "Disclosure procedure rules of standard pertaining to authentication and subscriber data write-in of personal handy phone system (public)" specified by the standard committee.

AMENDMENT HISTORY

* * Added ; Deleted

Number	Page	Amendments																		
1	2	1.3 Also, options are classified as follows, ~~but in the standard, only functional options are specified at present.~~ Furthermore, functional options will be divided into CS options and PS options in the future.																		
	8	Table 2.1 Service attributes <table><tr><th>Service attribute</th><th>Service item</th></tr><tr><td>Information transfer capability</td><td>Voice, 3.1kHz audio; <u>unrestricted digital</u></td></tr><tr><td>Transfer mode</td><td><u>Circuit mode</u></td></tr><tr><td>Information transfer rate</td><td>32kb/s</td></tr><tr><td>Communications format</td><td>Point-to-point</td></tr></table>	Service attribute	Service item	Information transfer capability	Voice, 3.1kHz audio; <u>unrestricted digital</u>	Transfer mode	<u>Circuit mode</u>	Information transfer rate	32kb/s	Communications format	Point-to-point								
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2-1	8	Table 2.2 Service types <table><tr><th>Type</th><th>Item</th><th>Overview</th></tr><tr><td rowspan="3">Bearer service</td><td>32kb/s speech</td><td>Provides bearer capability suited for voice communication with terminal. 32kb/s ADPCM CODEC is inserted.</td></tr><tr><td>32kb/s 3.1kHz audio</td><td>Provides bearer capability suited for 3.1kHz bandwidth communication with terminal. 32kb/s ADPCM CODEC is inserted.</td></tr><tr><td><u>32kb/s unrestricted digital</u></td><td><u>Provides bearer capability suited for digital data communication with terminal. Information is transmitted transparently.</u></td></tr><tr><td rowspan="2">Supplementary services</td><td>DTMF signal transmission</td><td>Service which generates DTMF signals on CS side from message from PS.</td></tr><tr><td><u>Hooking signal transmission</u></td><td><u>Service which generates hooking signals on CS side from message from PS.</u></td></tr><tr><td></td><td>(None)</td><td></td></tr></table>	Type	Item	Overview	Bearer service	32kb/s speech	Provides bearer capability suited for voice communication with terminal. 32kb/s ADPCM CODEC is inserted.	32kb/s 3.1kHz audio	Provides bearer capability suited for 3.1kHz bandwidth communication with terminal. 32kb/s ADPCM CODEC is inserted.	<u>32kb/s unrestricted digital</u>	<u>Provides bearer capability suited for digital data communication with terminal. Information is transmitted transparently.</u>	Supplementary services	DTMF signal transmission	Service which generates DTMF signals on CS side from message from PS.	<u>Hooking signal transmission</u>	<u>Service which generates hooking signals on CS side from message from PS.</u>		(None)	
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2-2	16	2.6 Encryption method ~~Private reference~~ → <u>Private standard</u> (2) The standard ~~encryption~~ <u>user scrambling</u> method is standardized ~~for public use~~ .																		
2-3	16	2.8 PS numbers ~~Private reference~~ → <u>Private standard</u> (1) Subscriber numbers: Number for identifying personal stations in connections with telecommunications network. <u>In public system, PS numbers always express subscriber numbers.</u> (2) ~~Extension line~~ The other numbers: Numbers for identifying personal stations within a certain system <u>(contains extension numbers).</u> <u>In private system, numbering plan is allowed to be independent in each system.</u>																		
3-1	24	3.2.16.1 Interference avoidance ~~Private reference~~ → <u>Private standard</u>																		
3-2	41	3.4.3.9 Receive signal strength indicator accuracy ~~Private reference~~ → <u>Private standard</u> In the 2nd line, ~~Applied to public radio station~~																		

AMENDMENT HISTORY

Number	Page	Amendments
3-3	43	3.4.3.10 Bit error rate floor performance ~~Private reference~~
4-	47 ~ 105	~~Private reference~~ → <u>Private standard</u> Except following paragraphs 4.2.13 VOX control, 4.2.13.1 VOX function setting, 4.2.13.2 VOX implementation example
4-	48	(7) Encryption ~~Specified as standard in a public system, and as an optional function in a private system.~~
4-	53	4.2.5.2 (1) (b) 2) Constraint (<u>Private standard/Public standard</u>) <u>Even though the system identification code or the operator identification code matches the given identification code, the PS must not transmit the control carrier to that CS. If the country code included in the 2nd system information broadcasting message from the CS does not match the given country code,</u> <u>However, in case of recalling-type handover, PS can transmit the control carrier to that CS regardless of information of the 2nd system information broadcasting message.</u>
4-	64	4.2.7.5 (2) <u>However, in a private system, the frequency of smaller carrier number shall be f1 and the frequency of large carrier number shall be f2.</u>
4-	65	4.2.7.6 (1) Global definition information reception operation <u>Furthermore, the 2nd system information broadcasting message must be sent from CS, and this message must contain a country code and a system type. In case of private systems, this message also contains a paging area type.</u> <u>As a rule, before LCCH steady reception, PS must receive a radio channel information broadcasting message and a 2nd system information broadcasting message. However, if PS stores a valid global definition information pattern, the radio channel information broadcasting message contains the contents of a global definition information and is not have to be necessarily received because the LCCH uplink access timing and LCCH, downlink superframe profile data, a country identification code, and system type for public and private system, and paging area type for private system required when which are necessary for starting LCCH reception from a new CS are already known.</u> <u>[1] By receiving the radio channel information broadcasting message and the 2nd system information broadcasting message, ...</u>

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Number	Page	Amendments
4-	66	(2) Local information broadcasting message reception operation However, the reception process of the broadcasting contents of the ~~2nd system information broadcasting message and option.....~~
4-	74	4.2.9 (3) Unique word pattern (a) Control physical slot; synchronization burst, <u>USPCH (2) [Option]</u> (b) Communication physical slot (except synchronization burst, <u>USPCH (2) [Option]</u>)
4-	75	4.2.10.2.1 (1) <u>When an additional ID (13bits) of private system is used for paging area number, additional ID consists of paging area number (n-bit) and additional ID (13-n-bit).</u>
4-	96	4.2.12 User scrambling ~~As a standard in public systems and as an option in private systems~~
4-	96	4.2.12.2 (~~Standard in public system, optional in private system~~)
4-	107 ~ 169	4.3 Link channel establishment phase In all pages of this chapter, Public reference is changed to Public standard. (<u>Private standard/Public standard</u>)
4-	107	4.3.2.2.1 Rules about unused elements Reserved : transmits "0", when an old-version equipment receives a bit other than "0" in a reserved area of the old version, it must ignore the bit and act as if the bit is "0".
4-	108	4.3.2.2.2 Standard protocol regulations (1) BCCH (B) is <u>functional</u> option. Other types are ignored by the reception side (2) Bit 7=1 (but public is SCCH only) is <u>functional</u> option. Other types are ignored by the reception side In the 4th line, Method of processing unrecognized options handling methods are shown in Table 4.3.1-3

AMENDMENT HISTORY

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4-		Table 4.3.1-1 Option classifications of link channel establishment phase (private systems) <table border="1"> <thead> <tr> <th>CI</th><th>Message type</th><th>LCH protocol type</th><th>Information element</th></tr> </thead> <tbody> <tr> <td>BCCH</td><td>Radio channel information broadcasting (bit 7 = 0)</td><td>—</td><td>With options in control carrier. When optional, offset area optional.</td></tr> <tr> <td>BCCH</td><td>System information broadcasting (bit 7 = 0)</td><td>Standard/ Optional</td><td>With options in paging area. 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AMENDMENT HISTORY

Number	Page	Amendments																		
4-	110	"Table 4.3.1-3 Method of Processing Unrecognized Option (Private Use)" is newly added.																		
4-	112	4.3.2.2.3 System information default regulations Defaults for the contents of system information broadcasting are specified, and in systems operating by default values (especially public systems), system information broadcasting can be omitted. Table 4.3.2-1 and Table 4.3.2-2 show defaults ~~pertaining to CS individual system information~~ to be used in system information broadcasting. ~~However, for private systems, examples are shown, and defaults may vary in each system.~~ Table 4.3.2-1 <table border="1"> <thead> <tr> <th>Function</th><th>Default</th><th>Notes</th></tr> </thead> <tbody> <tr> <td>CC protocol type</td><td>~~Discontinuous reception~~ ~~Intermission mode~~ ~~Overlap sending is possible.~~</td><td></td></tr> <tr> <td>Extension LCH protocol type</td><td>~~MM~~ function request omissible RT</td><td></td></tr> <tr> <td>Extension LCH protocol type</td><td>~~RT~~ function request omissible MM</td><td></td></tr> </tbody> </table> Table 4.3.2-2 <table border="1"> <thead> <tr> <th>Function</th><th>Default</th><th>Notes</th></tr> </thead> <tbody> <tr> <td>RT-MM protocol version</td><td>Version 1 (RCR STD-28 (version 1) or RCR STD-28 (version 1 Rev.-1))</td><td></td></tr> </tbody> </table>	Function	Default	Notes	CC protocol type	~~Discontinuous reception~~ ~~Intermission mode~~ ~~Overlap sending is possible.~~		Extension LCH protocol type	~~MM~~ function request omissible RT		Extension LCH protocol type	~~RT~~ function request omissible MM		Function	Default	Notes	RT-MM protocol version	Version 1 (RCR STD-28 (version 1) or RCR STD-28 (version 1 Rev.-1))	
Function	Default	Notes																		
CC protocol type	~~Discontinuous reception~~ ~~Intermission mode~~ ~~Overlap sending is possible.~~																			
Extension LCH protocol type	~~MM~~ function request omissible RT																			
Extension LCH protocol type	~~RT~~ function request omissible MM																			
Function	Default	Notes																		
RT-MM protocol version	Version 1 (RCR STD-28 (version 1) or RCR STD-28 (version 1 Rev.-1))																			
4-	115	4.3.2.4.1 Types of definition information (1) Global definition information — ~~(Note) If the paging area is undefined in the private system (if paging area number length n = option), it is treated as local definition information.~~																		
4-	116	Table 4.3.3 Definition information and transmission methods Column No 5 is newly added. Column No 6 is newly added.																		

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Number	Page	Amendments														
		<table><tr><th>No</th><th>Definition information</th></tr><tr><td>~~67~~</td><td>2nd system <u>operating</u> information</td></tr><tr><td>~~68~~</td><td>3rd system <u>operating</u> information</td></tr><tr><td>~~69~~</td><td></td></tr><tr><td>~~610~~</td><td></td></tr></table> <table><tr><th>Private system</th><th>Public system</th></tr><tr><td>~~Establishment~~ <u>Mandatory</u></td><td>~~Reserved~~ <u>Mandatory</u></td></tr></table>	No	Definition information	~~67~~	2nd system <u>operating</u> information	~~68~~	3rd system <u>operating</u> information	~~69~~		~~610~~		Private system	Public system	~~Establishment~~ <u>Mandatory</u>	~~Reserved~~ <u>Mandatory</u>
No	Definition information															
~~67~~	2nd system <u>operating</u> information															
~~68~~	3rd system <u>operating</u> information															
~~69~~																
~~610~~																
Private system	Public system															
~~Establishment~~ <u>Mandatory</u>	~~Reserved~~ <u>Mandatory</u>															
4-	116	(Note) BCCH (SYS2): 2nd system <u>operating</u> information broadcasting message; <u>Country code</u> - <u>System type</u> <u>paging area type</u> ; <u>2nd system operation information</u> . BCCH (SYS3): <u>3rd system operating information</u> .														
4-	117	(3) Local definition information: Shows <u>information included in local</u> <u>information broadcasting message information</u> ~~and~~ local definition information element <u>information of radio channel information</u> ~~broadcasting message, which is shown in~~ <u>Table 4.3.3</u>														
4-	117	4.3.2.4.3 Relationship between global definition information and local definition information ~~in a public system~~ . # global definition information is changed, ... ~~In a private system, the relationship between global broadcasting information~~ ~~and local broadcasting information can be mutually independent~~														
4-	117	4.3.2.5.1 Classification of definition information (1) Broadcasting information (information that should be received by PSs before LCH establishment) <u>- Country code, System type (G);</u> <u>- Paging area type (G);</u>														
4-	118	4.3.2.5.2.1 Broadcasting information transmission method Furthermore, if it is determined that there is a zone information indication function by the RT function request/response sequence <u>for a public system</u> .														
4-	119	4.3.2.5.2.3 Handing of notification status number of notification information (1) Private system <u>(CS option)</u>														

AMENDMENT HISTORY

Number	Page	Amendments
4-		<u>Regulation is the same as the one for public system</u> (1) is deleted. (2) is deleted. <u>Regulation is the same as the one for a public system</u>
4-	120	4.3.2.6.1 Version management rules (3) This standard specifies the protocols of version #. (4) is newly added 2
4-	120	4.3.2.6.2 Version determination method (3) is deleted. (4) is newly numbered as (3). (4) is newly added.
4-	121	<u>4.3.2.7 Function request method</u> This item is newly added.
4-	122	Table 4.3.# 5
4-	123	Table 4.3.# 6
4-		Option message (note #) 1
4-	123	Table 4.3.# 7
4-		2nd system information broadcasting ~~(note #)~~
4-		<u>Option message</u> (note #) 1
4-		When there is a reception indication of ~~2nd~~, 3rd
4-		(Note1) Private system and public system (~~reserved~~) <u>functional option</u>
4-		<u>Only for SCCH in public system</u>
4-		(Note 4) Private system and public system (functional option) <u>Only for SCCH in public system</u>

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Number	Page	Amendments															
4-	124	Table 4.3. ~~8~~ <u>8</u>															
4-		Table 4.3. ~~8~~ <u>9</u>															
4-		Table 4.3. ~~9~~ <u>10</u>															
4-		Table 4.3.9															
		<table><tr><td>3</td><td>CC protocol type</td><td>~~Reserved~~ System type</td><td>RT-MM protocol version</td></tr></table>	3	CC protocol type	~~Reserved~~ System type	RT-MM protocol version											
3	CC protocol type	~~Reserved~~ System type	RT-MM protocol version														
4-	125	Table 4.3. ~~9~~ <u>10</u>															
4-	126	System type (octet 3) This item is newly added.															
4-	126	Bit															
		<table><tr><td><u>3</u></td><td><u>2</u></td><td><u>1</u></td></tr><tr><td>0</td><td>0</td><td>0</td><td>Version 1 (RCR STD-28 (version 1) or <u>RCR STD-28 (version 1 Rev-1)</u>)</td></tr><tr><td>0</td><td>0</td><td>1</td><td>Version 2 (~~reserved~~) <u>RCR STD-28 (version2)</u></td></tr><tr><td><u>0</u></td><td><u>1</u></td><td><u>0</u></td><td><u>Version 3 (reserved)</u></td></tr></table>	<u>3</u>	<u>2</u>	<u>1</u>	0	0	0	Version 1 (RCR STD-28 (version 1) or <u>RCR STD-28 (version 1 Rev-1)</u>)	0	0	1	Version 2 (~~reserved~~) <u>RCR STD-28 (version2)</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>Version 3 (reserved)</u>
<u>3</u>	<u>2</u>	<u>1</u>															
0	0	0	Version 1 (RCR STD-28 (version 1) or <u>RCR STD-28 (version 1 Rev-1)</u>)														
0	0	1	Version 2 (~~reserved~~) <u>RCR STD-28 (version2)</u>														
<u>0</u>	<u>1</u>	<u>0</u>	<u>Version 3 (reserved)</u>														
4-	127	Table 4.3. ~~10~~ <u>11</u>															
4-		Table 4.3. ~~11~~ <u>12</u>															
4-	128	Table 4.3. ~~12~~ <u>12</u>															
4-	130	Table 4.3. ~~13~~ <u>13</u>															
4-		Table 4.3. ~~14~~ <u>14</u>															
4-	131	Table 4.3. ~~14~~ <u>14</u>															
4-		On line 9 from bottom. LCH protocol disagreement: shows that CS does not have the LCH protocol (including system type)															

AMENDMENT HISTORY

Number	Page	Amendments																
4-	132	Table 4.3. ~~15~~ <u>15</u> Table 4.3. ~~16~~ <u>16</u>																
4-		Table 4.3.15 <table><tr><td>3</td><td>CC protocol type</td><td>~~Reserved~~ System type</td><td>RT-MM protocol version</td></tr></table>	3	CC protocol type	~~Reserved~~ System type	RT-MM protocol version												
3	CC protocol type	~~Reserved~~ System type	RT-MM protocol version															
4-	134	System type (octet 3) This item is newly added.																
4-		RT-MM protocol version (octet 3) Bit <table><tr><td>3</td><td>2</td><td>1</td></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>0</td></tr></table> Version 1 (RCR STD-28 (version 1) or RCR STD-28 (version 1 Rev-1)) Version 2 (~~reserved~~) RCR STD-28 (version 2) Version 3 (reserved)	3	2	1	0	0	0	0	0	1	0	1	0				
3	2	1																
0	0	0																
0	0	1																
0	1	0																
4-	135	4.3.4.2.1 Radio channel information broadcasting Table 4.3. ~~17~~ <u>17</u> Inside table, <table><tr><td>Octet</td><td>Bit</td><td>8</td><td>7</td></tr><tr><td>4</td><td></td><td colspan="2">~~Reserved~~</td></tr></table> → <table><tr><td>Octet</td><td>Bit</td><td>8</td><td>7</td></tr><tr><td>4</td><td></td><td>Re-served</td><td>2nd system information broadcasting usage method (reserved note 3)</td></tr></table>	Octet	Bit	8	7	4		~~Reserved~~		Octet	Bit	8	7	4		Re-served	2nd system information broadcasting usage method (reserved note 3)
Octet	Bit	8	7															
4		~~Reserved~~																
Octet	Bit	8	7															
4		Re-served	2nd system information broadcasting usage method (reserved note 3)															
		(Note 1) However, in a private system, if option is selected in the paging area number length n _{PA} , the global definition information elements are treated as local definition information elements.																
4-	136	(Note 3) is newly added. Table 4.3. ~~17~~ <u>18</u>																
	136	Paging grouping factor n _{GROUP} (octet 3)																

AMENDMENT HISTORY

Number	Page	Amendments
4-	136	(Note 1) Table 4.3.19 19 <u>Paging area number length n_p (octet 3)</u> In a private system, it shows..... in the system information broadcasting message <u>or the bit length of paging area number within the additional ID when the fixed paging area method with the additional ID is used</u> . In a public system, it shows the length of paging area number <u>included in the CS-ID</u> .
137		Bit 4 3 2 1 (Private) 1 0 0 0 ~~Reserved~~ $n_p = 0$ (Note 1) 1 0 0 1 ~~Reserved~~ $n_p = 1$ 1 0 1 0 ~~Reserved~~ $n_p = 5$ 1 0 1 1 ~~Reserved~~ $n_p = 9$ 1 1 0 0 ~~Reserved~~ $n_p = 13$ (Note 2) (Note 1) is newly added. (Note 2) is newly added.
4-		~~Note 1~~ → (Note 3) (Note 4) is newly added.
4-	137	<u>2nd system information broadcasting usage method (octet 4)</u> This item is newly added.
4-	139	<u>Number of PCHs n_{PCH} (octet 5)</u> (Note 1) Table 4.3.19 19
4-		<u>Frame basic unit length n_{SUB} (octet 5)</u> (Note) Table 4.3.19 19
4-	141	(b) Public system - 0 1 <u>Shows that 2 LCCHs are used, and each LCCH independent.</u> This item is newly added. - ~~0 1~~ <u>Shows that 2 LCCH are used, and the PCH paging groups are inter-related.</u> 1 0 <u>LCCHs</u>

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Number	Page	Amendments
4-	142	<u>Control carrier structure (octet 7)</u>
4-	142	Bit 2 1 0 1 Shows that 2 frequencies are used, and each individual LCCH is independent. LCCHs ~~(However, reserved in public system)~~ (In private system, 2 frequencies are used; reserved in public system)
4-	143	<u>(The LCCH structure parameters in public system)</u> Table 4.3.19 19
	143	<u>(The LCCH structure parameters in private system)</u> This item is newly added.
	144	4.3.4.2.2 System information broadcasting message On line 4 from beginning. Table 4.3.20, Table 4.3.21 20 21 Table 4.3.20 20 (Note 1) ~~If CS does not broadcast a system information by CS is the default value.~~
4-	145	Table 4.3.21 21
	146	<u>CS information (octet 3)</u> Bit 2 0 Non-originating-exclusive CS (~~and~~ reception standby zone selection possible) 1 Originating-exclusive CS (~~and~~ reception standby zone selection impossible) (reserved in public system)
4-	147	<u>Paging area number (octet 4-6)</u> <u>Method of use of octet 4 and octet 5</u>

AMENDMENT HISTORY

Number	Page	Amendments																																				
4-		~~showe~~ paging area number in a private performing location registration ~~again~~																																				
4-		~~Usage examples are as follows:~~																																				
4-	147	(2) When $n_p = 0$ This item is newly added.																																				
4-		(3) When $8 > n_p > 0$ This item is newly added.																																				
4-	148	~~When~~ When $n_p = 8$ (4)																																				
4-		~~When~~ When $16 > n_p > 8$ (5)																																				
4-		~~When~~ When $n_p = 16$ (6)																																				
4-		~~When~~ When $n_p = \text{reserved}$ (7)																																				
4-	149	When $n_p = 5$, "Octet 4, 5 usage designation (octet 7)" is (01) This item is newly added. When $n_p = 5$, "Octet 4, 5 usage designation (octet 7)" is (10) This item is newly added.																																				
4-		RT-MM protocol version (octet 4) However in public system whether CS supports Version 1 or not. Bit <table><tr><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td></td></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>1/0</td></tr></table> Version 1 (RCR STD-28 (version 1) or RCR STD-28 (version 1 REV.-1)) present/absent <table><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>1/0</td><td>x</td></tr></table> Version 2 (RCR STD-28 (version 2)) present/absent (~~reserved for public~~) <table><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>1/0</td><td>x</td><td>x</td></tr></table> Version 3 present/absent (reserved)	8	7	6	5	4	3	2	1		x	x	x	x	x	x	x	x	1/0	x	x	x	x	x	x	x	1/0	x	x	x	x	x	x	x	1/0	x	x
8	7	6	5	4	3	2	1																															
x	x	x	x	x	x	x	x	1/0																														
x	x	x	x	x	x	x	1/0	x																														
x	x	x	x	x	x	1/0	x	x																														
4-	151	<u>Octet 4, 5 usage designation (octet 7)</u>																																				
4-	152	(Note 4) If (1 0) is used, all groups become the object of restriction groups, and the paging area number ~~n_p = 8~~ is used. $Q < n_p \leq 8$																																				
4-	150	<u>Broadcasting reception indication (octet 8)</u>																																				

AMENDMENT HISTORY

Number	Page	Amendments																																																																																																																																										
4-	152	<table><tr><td>Bit</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>0</td><td>0</td><td>1</td></tr><tr><td>-</td><td>-</td><td>-</td><td>0</td><td>1</td><td>1</td><td>-</td></tr><tr><td>-</td><td>-</td><td>-</td><td>1</td><td>0</td><td>1</td><td>-</td></tr></table> System information broadcasting reception indication 2nd system information broadcasting reception indication ~~reserved~~ Option information broadcasting reception	Bit	6	5	4	3	2	1	-	-	-	-	0	0	1	-	-	-	0	1	1	-	-	-	-	1	0	1	-																																																																																																														
Bit	6	5	4	3	2	1																																																																																																																																						
-	-	-	-	0	0	1																																																																																																																																						
-	-	-	0	1	1	-																																																																																																																																						
-	-	-	1	0	1	-																																																																																																																																						
4-	154	Table 4.3.22 2nd system information broadcasting message 22 <table><tr><th>Octet</th><th>Bit</th><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th></tr><tr><td>1</td><td>Re-served</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td><td></td></tr><tr><td>2</td><td colspan="8" rowspan="5">~~Country identification code*~~</td><td></td></tr><tr><td>3</td><td></td></tr><tr><td>4</td><td></td></tr><tr><td>5</td><td></td></tr><tr><td>6</td><td></td></tr><tr><td>7</td><td>Absolute slot number</td><td colspan="3">Broadcasting message status number^{m2}</td><td colspan="4">Option/Reserved (note)</td></tr><tr><td>8</td><td></td><td colspan="8">Broadcasting reception indication</td></tr></table> ↓ <table><tr><th>Octet</th><th>Bit</th><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th></tr><tr><td>1</td><td>Re-served</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td><td></td></tr><tr><td>2</td><td colspan="8" rowspan="2">~~Country identification code*~~</td><td></td></tr><tr><td>3</td><td></td></tr><tr><td>4</td><td colspan="8"><u>System type*</u></td><td></td></tr><tr><td>5</td><td colspan="8"><u>RT-MM protocol version</u></td><td></td></tr><tr><td>6</td><td colspan="8"><u>Reserved</u></td><td></td></tr><tr><td>7</td><td>Absolute slot number</td><td colspan="3">Broadcasting message status number₂</td><td colspan="4"><u>Paging area Type</u>*/Reserved (note 2)</td></tr><tr><td>8</td><td></td><td colspan="8">Broadcasting reception indication</td></tr></table>	Octet	Bit	8	7	6	5	4	3	2	1	1	Re-served	0	0	0	1	0	1	1		2	~~Country identification code*~~									3		4		5		6		7	Absolute slot number	Broadcasting message status number ^{m2}			Option/Reserved (note)				8		Broadcasting reception indication								Octet	Bit	8	7	6	5	4	3	2	1	1	Re-served	0	0	0	1	0	1	1		2	~~Country identification code*~~									3		4	<u>System type*</u>									5	<u>RT-MM protocol version</u>									6	<u>Reserved</u>									7	Absolute slot number	Broadcasting message status number ₂			<u>Paging area Type</u> */Reserved (note 2)				8		Broadcasting reception indication							
Octet	Bit	8	7	6	5	4	3	2	1																																																																																																																																			
1	Re-served	0	0	0	1	0	1	1																																																																																																																																				
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Octet	Bit	8	7	6	5	4	3	2	1																																																																																																																																			
1	Re-served	0	0	0	1	0	1	1																																																																																																																																				
2	~~Country identification code*~~																																																																																																																																											
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7	Absolute slot number	Broadcasting message status number ₂			<u>Paging area Type</u> */Reserved (note 2)																																																																																																																																							
8		Broadcasting reception indication																																																																																																																																										

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Number	Page	Amendments																								
4-		(Note 1) is newly added. (Note)→(Note 2)																								
4-		Table 4.3.23 Information elements in 2nd system information broadcasting message																								
4-		<u>Country code (octets 2-3)</u> This item is newly added.																								
		<u>System type (octet 4)</u> This item is newly added.																								
4-	155	<u>RT-MM protocol version (octet 5)</u> This item is newly added.																								
4-		<u>Paging area type (octet 7)</u> This item is newly added.																								
4-	156	<u>Broadcasting reception indication (octet 8)</u> Bit <table><tr><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>-</td><td>-</td><td>-</td><td>0</td><td>0</td><td>1</td></tr><tr><td>-</td><td>-</td><td>-</td><td>0</td><td>1</td><td>1</td></tr><tr><td>-</td><td>-</td><td>-</td><td>1</td><td>0</td><td>1</td></tr></table> System information broadcasting reception indication 2nd system information reception indication (~~system~~) Option information broadcasting reception 	6	5	4	3	2	1	-	-	-	0	0	1	-	-	-	0	1	1	-	-	-	1	0	1
6	5	4	3	2	1																					
-	-	-	0	0	1																					
-	-	-	0	1	1																					
-	-	-	1	0	1																					
4-	157	4.3.4.2.4 3rd system information broadcasting message On line 2 from beginning of this paragraph. Table 4.3.24, Table 4.3.25 24 25																								
4-		Table 4.3.24 24																								
4-	158	Table 4.3.25 25																								
4-	160	4.3.4.2.5 Option information broadcasting message																								
4-		Table 4.3.26 26																								

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Number	Page	Amendments												
4-		Table 4.3.26 27												
4-	162	Table 4.3.27 28												
4-		Table 4.3.28 29												
4-		Table 4.3.28 <table border="1"><tr><td>7</td><td>PS number (12th digit)</td><td>PS number (13th digit) /Extension paging service type</td></tr></table>	7	PS number (12th digit)	PS number (13th digit) /Extension paging service type									
7	PS number (12th digit)	PS number (13th digit) /Extension paging service type												
		<u>Paging service type (octet 1)</u> Bit <table border="1"><tr><td>7</td><td>6</td><td>5</td></tr><tr><td>1</td><td>0</td><td>1</td></tr></table> ~~Reserved~~ Shows the paging service by the extension paging service (reserved in public system).	7	6	5	1	0	1						
7	6	5												
1	0	1												
4-	163	<u>Extension paging service type (octet 7)</u> This item is newly added.												
4-	165	Bit <table border="1"><tr><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>-</td><td>-</td><td>-</td><td>0</td><td>1</td><td>1</td></tr></table> 2nd system information reception indication (note)	6	5	4	3	2	1	-	-	-	0	1	1
6	5	4	3	2	1									
-	-	-	0	1	1									
4-	169	(Example 5) is newly added.												
4-	171 ~ 214	Chapter from 4.4 to 4.4.3.4 were changed [private standard] from [private reference].												
4-	211	4.4.3.1.1 Range of standard (1) However, examples for a private system are shown, and defaults can be varied in each system.												
4-	212	Table 4.4.3.1.1 Defaults of RT function request contents (private) (note) Function request in table: ~~Condition report function~~ ~~Encryption~~ User Scrambling PS-ID Notification control information Transmitted Power Control												

AMENDMENT HISTORY

Number	Page	Amendments
		~~VOX Function Information~~ ~~Zone information indication function~~ Defaults in table: ~~No condition report~~ No active encryption control: standard ~~encryption~~ ~ <u>user scrambling</u>
4-	212	~~No PS-ID Notification~~ ~~CS-Recalling-type connection function to other CS~~ ~~between paging areas absent~~ <del>PS-Recalling-type connection ~</del> ~~No Transmission Power control~~ ~~No VOX Function~~ ~~Zone information indication function absent~~
4-	212	(Note) is newly added.
4-	213	4.4.3.1.1 Range of standard (2) ~~However, examples for a private system are shown, and defaults can be varied in each system.~~
4-	213	table 4.4.3.1.3 Defaults of MM function request contents (private) ~~not~~ defaults in table: ~~Standard authentication function present (note)~~ <u>Standard authentication sequence for private systems</u> <u>present (note)</u> Fixed paging area <u>by Additional ID</u> (note) The authentication ~~method~~ in private systems - <u>algorithm</u>
4-	215 ~ 278	~~Private reference~~ → <u>Private standard</u> except following paragraph. ・ 4.4.3.5.2.3 Condition inquiry ・ 4.4.3.5.2.4 Condition report ・ 4.4.3.5.2.5 Encryption control ・ 4.4.3.5.2.6 Encryption control acknowledge ・ 4.4.3.5.2.11 PS Release ・ 4.4.3.5.2.18 Transmission Power Control ・ 4.4.3.5.2.19 VOX control ・ 4.4.3.5.2.20 PS-ID notification ・ 4.4.3.5.2.21 Zone information indication ・ 4.4.3.5.3.4.2 Broadcasting information ・ 4.4.3.5.3.4.6 Condition report function ・ 4.4.3.5.3.4.9 Encryption control information ・ 4.4.3.5.3.4.13 PS-ID Notification control information ・ 4.4.3.5.3.4.14 Reception level ・ 4.4.3.5.3.4.15 Report Condition ・ 4.4.3.5.3.4.19 Transmission Power Control ・ 4.4.3.5.3.4.20 Transmission Power Control Request

AMENDMENT HISTORY

Number	Page	Amendments
4-		• 4.4.3.5.3.4.21 VOX Control • 4.4.3.5.3.4.22 VOX Function information • 4.4.3.5.3.4.23 Zone condition report • 4.4.3.5.3.4.24 Zone information indication function • 4.4.3.5.4 RT supplementary (1) [1] Condition inquiry • 4.4.3.5.4 RT supplementary (1) [2] Process when condition report message is received • 4.4.3.5.4 RT supplementary (2) [1] Process when condition report message is received
4-	222	Table 4.4.3.5.8 Encryption key set message contents (Note) . . . that ~~standard encryption~~ is specified. <u>default encryption</u>
4-	225	Table 4.4.3.5.11 Paging response message contents In the lower part of the Table, <u>Paging response type</u> and <u>Note</u> are added
4-	238	Table 4.4.3.5.23-1 Information element coding (private) In the lower part of the table, <u>0011010 Paging Response Type</u> This column is added.
4-	245	Figure 4.4.3.5.7 Broadcasting information • Octet 5 - Bit 7: <u>Reserved</u> → <u>2nd system information broadcasting usage method*/reserved (note7)</u> • Octet 9 - Bit 5: (Note 6) → (Note 5) • Octet 13: (Note 4) → (Note 6) • Octet 16 ~ 20: Option / Reserved (Note 3) → Octet 16, 17: <u>Country identification Code*</u> → Octet 18: <u>System type*</u> → Octet 19: <u>RT-MM protocol version</u> → Octet 20: <u>Reserved</u> • Octet 21 - Bit 1 ~ 3: ~~Reserved~~ → <u>Paging area type* / Reserved (Note 7)</u> • Octet 22 ~ 26: (Note 4) → (Note 3)
4-	246	• ~~(Note 3)~~ → Note 3 is deleted • (Note 4) → (Note 3) • (Note 6) → (Note 4) • (Note 8) → (Note 5) • (Note 7) → (Note 6) • (Note 7) <u>This information element is used in private system, reserved in public systems.</u> (Note 7) is newly added

AMENDMENT HISTORY

Number	Page	Amendments
4-	246	~~ECCH interval value in octet 3~~ ~~Broadcasting message class numbers~~ ~~mtm2m3 (octets 13-21/27)~~ These items are deleted <u>Coding regulations about each information element in octet 3 ~ 27 are the same specification as coding regulations about information elements in the each broadcasting message specified in "4.3.4.2 Broadcasting messages".</u> However, "Octets 4, 5 usage designation" in 4.3.4.2 broadcasting messages is applied to "Octets 12, 13 usage designation".
4-	246 ~ 270	Figure 4.4.3.5.8 ~ Figure 4.4.3.5.29
4-	251	4.4.3.5.3.4.8 Encryption Encryption (octet 2) x x x 1/0 ~~Standard encryption~~ present/absent User scrambling
4-	253	4.4.3.5.3.4.10 Encryption key set Encryption (octet 3 ~ *) ~~Standard encryption~~ method is shown in Appendix Y. User scrambling
4-	254	4.4.3.5.3.4.11 PS number Octet 8 · Bit 1 ~ 4 : PS number (thirteenth number) PS number (thirteenth number) / <u>Extended paging service type</u> Paging service type (octet 2) 1 0 1 ~~Reserved~~ <u>Shows paging service by extension paging service type (however, reserved in public system).</u>
4-	255	<u>Extension paging service type (octet 8)</u> This item is added
4-	257	4.4.3.5.3.4.13 PS-ID Notification control information In the 2nd line, This information element is ~~added~~. <u>a single octet information element (type 1)</u>
4-	267	4.4.3.5.3.4.21 VOX Control In the 2nd line, This information element is ~~added~~. <u>a single octet information element (type 1)</u>
4-	270	<u>4.4.3.5.3.4.25 Paging response type</u> This item is added

AMENDMENT HISTORY

Number	Page	Amendments
4-	271	4.4.3.5.4 RT supplementary regulations (1) Cell station operation ~~(Private reference)~~ [1] Condition inquiry ~~(Private reference)~~
4-	274	(Note 3) CS-ID designation switching to another CS is a function option. (for public system)
4-	276	(Note 2) CS-ID designation switching to another CS is a function option. (for public system)
4-	279 ~ 305	~~Private reference~~ → <u>private standard</u>
4-	284	Table 4.4.3.6.7 Location Registration Area ~~Broadcasting Report~~ message contents
4-	288	(note) If PS sends this message, MM function request must be required. in Fig 4.4.3.6.3-1 Location Registration Report <u>(Note)</u> <u>(Note) Functional option</u>
4-	291	in Table 4.4.3.6.10-1 Active Authentication <u>(Note 1)</u> Location Registration Area Report <u>(Note 1)</u> Paging area <u>(Note 1)</u> Reception level <u>(Note 1)</u>
4-	293	4.4.3.6.3.4.3 Authentication Ciphering Pattern The Authentication ciphering pattern is <u>the element which be found from the Authentication Random Pattern at PS to inform the calculation result to CS,</u> and it is shown in Figure 4.4.3.6.6. This information element is of variable length.
4-	293	in Fig 4.4.3.6.6 Shows <del> ciphered</del> <u>calculation result</u> bit string <u>which be found from the Authentication Random Pattern.</u>
4-	294	Figure 4.4.3.6.7 Authentication Type
		<u>Authentication Type (octet 2)</u>

AMENDMENT HISTORY

Number	Page	Amendments
4-	298	Bit 8 7 6 5 4 3 2 1 x x x x x x x 1/0 Standard authentication function present/absent (<u>however, reserved in private system</u>). x x x x x x 1/0 x Reserved (authentication function present/absent) x x x 1/0 x x x x Standard authentication sequence for private systems present/absent x x 1/0 x x x x x Reserved (authentication sequence present/absent) Other Option x: Don't care (Note 1) Bits 1 ~ 3 indicate whether or not there is an independent authentication ~~sequence~~ function available. (Note 2) Bits 5 and 6 indicate whether or not there is an independent authentication sequence available.
		Paging area (octet 2) Bit 8 7 6 5 4 3 2 1 0 x x x x x x 1/0 Fixed paging area by System Information Broadcasting (BCCH (SYSI)) present/absent PS specified paging area present/absent 0 x x x x x 1/0 x PS specified paging area present/absent 0 x x x x 1/0 x x Fixed paging area by Additional ID present/absent 1 x x x x x x x Option Other Reserved x: Don't care
		302 [Example 5] is added.
		303 Paging service type (octet 2) Bit 7 6 5 1 0 0 Reserved 1 0 1 ~~Reserved~~ Shows paging service by Extension Paging Type (<u>however, reserved in public system</u>). 1 1 x Option (private)/Reserved (public) x: Don't care

AMENDMENT HISTORY

Number	Page	Amendments
4-	301	*Extend service type (octet 8)* is added
4-	307 ~ 390	~~Private reference~~ → private standard
4-	310	[2] Recalling (P1)*setup (facility: ~~Handover~~)*..... Handover or private handover
4-	310	[2] Recalling (C1)*setup (facility: ~~Handover~~)*..... Handover or private handover
4-	312	Table 4.4.3.7.1 CC message overview (Note 1) Private only. <u>Functional option in private system</u> . (Note 2) Functional option in ~~public~~ system. both public and private
4-	316	Table 4.4.3.7.8 Information message contents (Note 2) Indicate when in overlap sending (P2) state and thereafter. In addition, included when PS sends hooking signal to CS.
4-	320	Table 4.4.3.7.12 SETUP message contents *Repeat indicator* ~ *Manual call origination indicator* are added.
4-	321	(Note 10) ~ (Note 15) are added.
4-	326	and Version 2 is added in Note 2 of Fig 4.4.3.7.3
4-	327	Figure 4.4.3.7.4 Message type (Note 1) Private only. <u>Functional option in private system</u> . (Note 2) Functional option in ~~public~~ system. both public and private
4-	330	Table 4.4.8.7.17 Information element coding [Codeset 0] Single octet information element 1 0 1 : : : : Repeat indicator Multiple octet information element 1 1 1 1 1 0 0 Low layer compatibility 1 1 1 1 1 0 1 High layer compatibility [Codeset 5] 0 1 0 0 0 0 1 PS identity (note 4) 0 1 0 0 0 0 1 Manual call origination indicator (note 4) 0 1 0 0 0 1 1 Communication type (note 4)

AMENDMENT HISTORY

Number	Page	Amendments
	333	<u>Coding standard (octet 3)</u> 0 0 ~~Reserved~~ → RCR standard 1 0 ~~RCR standard~~ → Reserved
	334	<u>Information transfer rate (octet 3)</u> 1 1 0 0 0 ~~Circuit Mode 32kbit/s~~ Reserved 1 1 0 0 1 ~~Reserved (Circuit Mode 16kbit/s)~~ Reserved 1 1 0 1 0 ~~Reserved (Circuit Mode 8kbit/s)~~ Reserved 0 0 1 1 1 Reserved Reserved (Circuit Mode 8kbit/s) 0 1 0 1 0 Reserved Reserved (Circuit Mode 16kbit/s) 0 1 1 0 0 Reserved Circuit Mode 32kbit/s 1 0 0 0 0 Reserved Reserved (Circuit Mode 64kbit/s) (Note) is added <u>User information layer 1 protocol (octet 5)</u> 0 0 0 0 1 ~~Standardized rate adaption JT-V110/X30~~ → 0 0 1 1 1 ~~Non-ITU-T standardized rate adaption~~ → are added 335 ~ 338 Bit coding of octet 5a, 6 and 7 are defined and octet 5b ~ 5d are added.
4-	350	[1] Recalling-type channel switching Octet 15.3.3 Length ~~note 4~~ (note 10) Octet 15.3.3 Calling party number content length ~~note 4~~ (note 10)
4-	350	(Note 10) is added.
4-	351	[2] Recalling type channel switching for private system. Protocol date unit is added.
4-	354	~~図~~ [3] PB signal Octet 15.3.1 Length (note 8) (Note 8) is added.
4-	358	4.4.3.7.3.5.12 Keypad facility The keypad facility is by the terminal keypad. In addition, the keypad facility is used to carry the hooking signal information from PS to CS. The keypad facility information in Figure 4.4.3.7.15. (add) (Note) is added
	359	<u>Coding standard (octet 3)</u> 0 0 ~~Reserved~~ → RCR standard 1 0 ~~RCR standard~~ → Reserved
4-	363	<u>4.4.3.7.3.5.18 PS identity</u> This item is added.
	366	<u>4.4.3.7.5.19 High layer compatibility</u> This item is added

AMENDMENT HISTORY

Number	Page	Amendments
	369	<u>4.4.8.7.5.20 Low layer compatibility</u> This item is added
	382	<u>4.4.3.7.5.21 Repeat indicator</u> This item is added
	388	<u>4.4.3.7.5.22 Manual call origination indicator</u> This item is added
	388	<u>4.4.3.7.5.23 Communication type</u> This item is added
4-	385	Table 4.4.3.7.18 Supplementary service types <u>Hooking signal transmission (note)</u> is added. (Note) is added.
4-	385	Figure number is changed. Table 4.4.3.7.22
4-	385	<u>4.4.3.7.4.1.2 Hooking signal transmission</u> This item is added
4-	386	Figure number is changed. Table 4.4.3.7.24
4-	389	4.4.3.7.5.2 Functional operation state (2) Recalling-type channel switching for private system is added. Table 4.4.3.7.19 Recalling-type channel switching state (PS side) / Recalling-type channel switching for private system state (PS side)
4-	390	Table 4.4.3.7.20 Recalling-type channel switching state (CS side of new channel) (note 1) / Recalling-type channel switching for private system state (CS side of new channel) (note 1)
4-	391 ~ 427	4.4.3.8 Control sequences ~~Private reference~~ → Private standard But "Private reference in following items does not change. 4.4.3.8.5.5 Channel switching during communication (switching to other CS: TCH switching-type with PS request) 4.4.3.8.5.6 Channel switching during communication (switching to other CS: TCH switching-type with CS indication) 4.4.3.8.6 Zone information indication
4-	394	Figure 4.4.3.8.2 Control sequence (overlap sending) (Note 5) Overlap sending is a functional option
4-	400	4.4.3.8.4 Location registration [6] Location registration area report (MM) This item is added

AMENDMENT HISTORY

Number	Page	Amendments
		~~樹~~ Authentication (MM) [7]
4-	401	~~樹~~ Location registration acknowledge (MM) [8]
4-	401	Figure 4.4.3.8.6 Control sequence (location registration) <u>! MM Location registration area report (note 4)</u>
4-	401	(note 4) is newly added.
4-	403	4.4.3.8.5.2 Channel switching during communication (switching to other CS: PS recalling-type) (1) Recalling-type handover request (CC) In the 2nd line, facility: ~~However~~ <u>Recalling-type channel switching or Private recalling-type channel switching</u> (2) Recalling-type handover proceeding (CC) In the 2nd line, facility: ~~However~~ <u>Recalling-type channel switching or Private recalling-type channel switching</u> In the 13th line, <u>Only in a private system, the network can do the authentication with the authentication request message (MM) and the authentication response message (MM) by the judgment of the network, without the reference of the authentication ciphering pattern in the setup message (facility: Private recalling-type channel switching) (CC).</u> <u>[6] Authentication (MM)</u> This item is added
4-	404	~~樹~~ Call connected (CC) [7] In the 3rd line, ...connect message (facility: ~~However~~) (CC) to the user. <u>Recalling-type channel switching or Private recalling-type channel switching</u> ...connect message (facility: ~~However~~) (CC) terminates. <u>Recalling-type channel switching or Private recalling-type channel switching</u>
4-	405	Figure 4.4.3.8.8 Control sequence (channel switching during communication (switching to other CS: PS recalling-type)) <u>! MM Authentication request (note 10) SACCH/FACCH</u> <u>! MM Authentication response (note 10) SACCH/FACCH</u>
4-	406	<u>(Note 10) This control signal can be transmitted only in a private system.</u>
4-	407	Figure 4.4.3.8.9 Control sequence (channel switching during communication (switching to other CS: Recalling-type with PS request)) <u>! MM Authentication request (note 10) SACCH/FACCH</u> <u>! MM Authentication response (note 10) SACCH/FACCH</u>

AMENDMENT HISTORY

Number	Page	Amendments
4-	408	<u>(Note 10) This control signal can be transmitted only in a private system.</u>
4-	409	Figure 4.4.3.8.10 Control sequence (channel switching during communication (switching to other CS: Recalling-type with CS indication)) <u>! MM Authentication request (note 10) SACCH/FACCH</u> <u>! MM Authentication response (note 10) SACCH/FACCH</u>
4-	410	<u>(Note 10) This control signal can be transmitted only in a private system.</u>
4-	413	<u>4.4.3.8.7 Zone paging</u> This item is added
4-	416	<u>Figure 4.4.3.8.14 Control sequence (zone paging)</u> This item is added
5-1	417	This chapter specifies the voice coding method for ~~the second generation cordless telephone system~~ <u>the personal handy phone system.</u> ... 32 kbit/s ADPCM as per ITU-T recommendation ~~G.721~~ <u>G.726</u> ~~However, this excludes the T-law coding method.~~
6	422	6.2.5.6 ~~Standard encryption~~ <u>User scrambling</u> In communication between PSs, since unique standard scrambling (section ~~6.2.5.6~~) <u>6.2.5.5</u>) ~~standard encryption~~ also uses this, ... <u>User scrambling</u>
7-1	457	7.2.8 Received signal strength indicator accuracy ~~Private reference~~ → <u>Private standard</u>
7-2		7.2.8.1 Method by area information and standby zone holding function ~~Private reference~~ → <u>Private standard</u>
7-3	458	7.2.8.2 Method by condition report function ~~or location registration area report function~~ (2) Measurement equipment conditions, etc. a. ~~About it delete the received signal strength of the location registration area report signal from the equipment under test and can display its contents.~~ (4) Measurement procedures b. ~~On the received signal strength from the location registration area report signal from the equipment under test~~
7-4	459	7.2.8.3 Method by which reception level value is displayed on display or provided display equipment ~~Private reference~~ → <u>Private standard</u>

AMENDMENT HISTORY

Number	Page	Amendments
7-5		7.2.9 Bit error rate floor characteristics ~~Private reference~~
7-6	468	7.3.2.9 received signal strength indicator accuracy ~~Private reference~~ → <u>Private standard</u>
7-7		7.3.2.10 Bit error rate floor characteristics (test item measurement). ~~Private reference~~
7-8		7.3.2.11 Bit error rate floor characteristics (RFCD measurement) ~~Private reference~~
8	473	Chapter 8 Terminology The description of Encryption is deleted.
	477	Scramble (Maximum ~~cycle period~~ sequence: Largest ~~cycle period~~ series)
	478	The description of "User Scramble" is newly added.
A~Z		Appendix A to Z ~~Private reference~~ → <u>Private standard</u>
		Appendix A: Broadcasting signal transmission method on logical control channel and PS reception operation
A-1	481	1 (1) Broadcasting signal that reports global definition information: Radio channel information broadcasting, <u>2nd system information broadcasting</u> 1 (2) Broadcasting signal that informs only local definition information: System information broadcasting, ~~2nd system information broadcasting~~ , 3rd system information broadcasting...
A-2	481	3 (1) ...in the radio channel information broadcasting and the 2nd system information broadcasting informed by BCCH (A). (6) PS ~~does not~~ can transmit recalling-type handover request to the relevant CS regardless of CS information and information of the 2nd system information broadcasting message.
F-1	513	Appendix F: RT State transition diagram (PS side) In the upper middle <u>In coming call (ringing cessation)</u> (Private)
G-1	515	Appendix G: RT SDL diagram (PS side) 1/15 In the center, (private), message of <u>"In coming call (note 2)"</u> .

AMENDMENT HISTORY

Number	Page	Amendments
		primitive of <u>"ringing cessation indication"</u> , and state of <u>"stand by"</u> is added.
		(note 2) is added
K-2	543	<u>(Note 5) Do not use when all paging is performed in private system.</u>
M-1	547	Appendix M: MM state transition diagram (PS side) (Location registration area report) (private only) <u>(Note)</u> (Note) is added.
N-1	550	Appendix N: MM SDL diagram (PS side) 2/3 In the left, Location registration area report request <u>(Note)</u> (Note) is added
P-1	553	Appendix P: MM state transition diagram (CS side) In the middle of diagram, <u>T.O. (TM303C)</u> (Note) is added
Q-1	555	Appendix Q: MM SDL diagram (CS side) 1/3 Location registration area report <u>(Note)</u> . (Note) This message is used when PS specified paging area is registered. (Note) is added
Q-2	556	Appendix Q: MM SDL diagram (CS side) 2/3 Under the 3rd step of the leftmost row, Zone paging area method with PS indication is added. In the 3rd row from left, "Timer TM303C time out" is added.
Q-3	558	Appendix R: MM CS side timers In the 4th column, <u>TM303C (4S)</u> This item is added In the 3rd column of the 6th row, <u>Optional (note 1)</u> (Note 1) Mandatory when data link re-establish performed. (Note 2) <u>Mandatory in case of paging area method with PS indication.</u> This item is added
T-1	571	Appendix T: CC SDL diagram (PS side) 10/17 In the left <u>(Functional option)</u> 17/17 In the middle "N", "Y" is added.
V-1	587	Appendix V: CC SDL diagram (cs side) 6/19 In the left <u>(Functional option)</u> .

AMENDMENT HISTORY

Number	Page	Amendments
W-1	601	Appendix W: CC CS side timers In the column "TC302C", of the row "Mandatory/Optional timer", Mandatory if overlap sending is implemented. (note 3)
Y-1	621	Appendix Y: ~~Encryption~~ User Scrambling control methods 1.2 Setting of presence or absence of ~~encryption~~ user scrambling PS applies . . . ~~encryption~~ user scrambling key is set. Temporary encryption (However, with certain ~~encryption keys~~ user scrambling, . . . before and after ~~encryption~~ user scramble) 621 1.3 Phase in which ~~encryption key~~ user scrambling is set ~~Encryption key~~ user scrambling set is . . . phase. 622 (Note 1) Underline . . . for private system, and default value for public system. (Note 2) Standard encryption is the ~~standard encryption~~ user scrambling mechanism method.
Z-1	624	Appendix Z: Operation of PS that has automatic location registration function.
Z-2	624 ~ 628	location registration reception data, location registration reception information → <u>location registration data</u>
Z-3	625	...if valid location registration ~~reception~~ data (the ~~operator identification code~~ ~~and paging area number~~) (Note 1) is stored by the PS, the... The conditions for valid location registration ~~reception~~ data of PS are as follows. Z-4 ...if the relevant ~~paging area number~~ <u>location registration data</u> transmitted by... Z-5 ...registration differ from the ~~operator identification code or paging area~~ ~~number~~ <u>location registration data</u> of the CS... Z-6 (Note 1) <u>Location registration data</u> - In public, <u>location registration data</u> is country identification code, operator identification code or paging area number. - In private, when it is "fixed paging area method by system information broadcasting" or "paging area method by additional ID", <u>location registration</u> <u>data</u> is country identification code or system identification code, when it is "paging area method with PS indication", <u>location registration data</u> is country code or CS-ID.*

AMENDMENT HISTORY

Added (ADD) ; Deleted (DEL) ; Changed (CHG)

Number	Page	Amendments
Z-7	626	- location registration retry impossible: ...Also, for a location registration prohibited area, the ~~operator identification~~ ~~code and paging area number~~ <u>location registration data</u> of the relevant CS must be stored.
Z-8	627	Figure 2 PS operation in location registration (1/2) Location registration reject (retry impossible) For location registration prohibited area, ~~operator ID code and paging area~~ ~~number~~ <u>location registration data</u> of relevant CS are stored.
AA-1	629	In the shaded part of Figure 1, Signal (1) Handover (2) <u>Private Handover (3)</u>
AA-2	630	In the 9th line of Figure 2, pBSending Service, handover, <u>privatehandover</u>
AA-3	630 ~ 631	In the 35th line of Figure 2, <u>privateHandoverType ::= OPERATION</u> <u>ARGUMENT SET (handoverCategory:.....</u> <u>.....(65) operation (1)</u> <u>privatehandover (3))</u> This description is added
AB-1	632	<u>Appendix AB WLL standard</u> This item is added
AC-1	696	<u>Appendix AC Control / communication carriers of private system used in the</u> <u>countries outside of Japan.</u> This item is added
	699	<u>Appendix AD Compatibility checking</u> This item is added
	700	<u>Appendix AE Low layer information coding principles</u> This item is added
	702	<u>Appendix AF Low layer compatibility negotiation</u> This item is added
	704	<u>Appendix AG Interface between PS and external terminal</u> This item is added

AMENDMENT HISTORY

Added [ADD] ; Deleted [DEL] ; Changed [CHG]

Number	Page	Amendments
		<u>Appendix AH Rate adaption procedure for unrestricted service on CS for interworking with ISDN-based Network</u> This item is added <u>Appendix AI Rate adaption rule at the Um reference when communicating with V-110 terminals</u> This item is added

PERSONAL HANDY PHONE SYSTEM

ARIB STANDARD
VERSION 2
RCR STD-28

ISSUED	December	1993
Rev.-1	March	1995
Ver.-2	February	1996

Published by

Association of Radio Industries and Businesses

1-4-1 Kasumigaseki, Chiyoda-ku, Tokyo 100, Japan

TEL 81-3-5510-8590
FAX 81-3-3592-1103

Printed in Japan
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Distribution Price ¥ 60,900 (Base price ¥ 58,000 ; Tax ¥ 2,900)

