JT-Q931-b
PHS Public Cell Station - Digital Network Interface
- Layer 3 Specification -

1. Relations with International Standards

Based on TTC Standard JT-Q931(Version 9: established on April 22nd, 1999), this Standard specifies the signalling system along with a policy to keep consistency with interface conditions defined in Association of Radio Industries and Businesses (ARIB) STD-28 "Second Generation Cordless Telephone System" Standard (Version 3.2: established on Feb. 2nd, 1999) (hereinafter referred to as the ARIB Standard RCR STD-28 (Version 3.2)), and PHS MoU Specification B-IF2.02 (Version 2: established in July, 1998). In addition, in order to improve PHS public CS maintainability and manageability of PHS public CS, based on TTC Standard JT-Q931 this standard specifies packet communication procedures using B/D-channel which can be setup call by call basis.

The differences from TTC Standard JT-Q931 are shown in the table.

Because this standard has its basis on TTC Standard JT-Q931, chapters and sections are arranged in a way to keep consistency with TTC Standard JT-Q931. Due to this reason, chapters and sections that are included in TTC Standard JT-Q931, but are categorized as out-of-scope for standardization in this Standard, are herein described with a mark "#", and added items are herein described with a mark "*".

2. An item for further study

- Advice of charge

Concerning advice of charge, information element for advice of charge is not specified in this Standard because advice of charge format and so on are dependent on each carrier. However, Advice of charge information element (Refer to the ARIB Standard Section 4.4.3.7.3.5.16) is standardized in the ARIB RCR STD-28 (Version3.2). Therefore, it is an item for further study whether or not to standardize information element to be used for advice of charge in this Standard, as well.

3. The revision history of this Standard

Version	Date	Outline
1	Nov. 26, 1993	Established
2	Nov. 24, 1994	Revision with the establishment of RCR STD-28 (Version1) and terminological change to PHS.
3	Nov. 28, 1995	Revision with providing '3.1kHz Audio'
4	Apr. 24, 1996	Revision with adding information to realize unrestricted digital communication

5	Apr. 22, 1999	Revision with addition of PHS-UUS supplementary service (Service 1 implicit request) and JT-Q931 revision
6	Apr.20, 2000	Revision with addition of packet communication procedures using B/D-channel which can be setup call by call basis

4. Note

This standard provides the layer 3 specification on interface between Public CS and digital network. It is not mandatory to supply all the specifications on this interface.

5. Others

5.1 Reference standards and recommendations etc.

ARIB Standard: RCR STD-28 (Version 3.2)

TTC Standards: JT-Q931 (Version 9), JT-Q850 (Version 1)

ITU-T Recommendation: Q.931 (1998)

PHS MoU Specification:B-IF2.02 (Version 2)

Table (1/8)
Differences from JT-Q931

Item	Differences between JT-Q931 and this Standard	Reasons
1) Common terms	(1)"User" is changed to "Public CS" and "network" is changed to "digital network". (2)"U0, U1 ..." which are the call states on the user side are changed to "C0, C1 ..." which are the call states on the Public CS side.	(1)This change makes clear what "user" and "network" mean. (2)Because the acronym is based on the English terminology “Cell Station”.
2) Protocol discriminator	New protocol discriminator value is provided for JT-Q931-b.	JT-Q931-b is the subset of TTC standard JT-Q931, but the value is used on NNI.
3) Mode	"User signalling bearer service control mode" is deleted.	"User signalling bearer service control mode" is not clearly defined of its usage.
4) Messages for circuit mode connection control	(1)SETUP ACKNOWLEDGE message is not provided. (2)RESUME message, RESUME ACKNOWLEDGE message, RESUME REJECT message, SUSPEND message, SUSPEND ACKNOWLEDGE message, and SUSPEND REJECT message are not provided. (3)INFORMATION message is not provided.	(1)It is not clearly defined of its usage. (2)They are not applied in this standard. (3)Messages and information elements for stimulus procedure are out of scope for this standard.
5) Information elements for circuit mode connection control	(1)More data information element, Congestion level information element, Call identity information element, Network-specific facilities information element, Display information element, Date/time information element, and Transit network selection information element are not provided. (2)Sending complete information element is not provided. (3)Keypad facility information element and Signal information element are not provided.	(1)They are not applied in this standard. (2)They are not applied in this standard. (3)Messages and information elements for stimulus procedure are out of scope for this standard.

Table
Differences from JT-Q931

Item	Differences between JT-Q931 and this Standard	Reasons
6) Connection configurations	Point-to-point connection is used between Public CS and digital network. However, in case of incoming call to Public CS, DL-UNITDATA- REQUEST primitive is sent from digital network. and call state management in above case corresponds to that of point-to-multipoint connection. Then call abort status is defined.	The configuration with plural public CSs connecting to an interface is not defined. It can be avoided to receive invalid messages at incoming call.
7) First response for incoming call	The first response to SETUP message from Public CS must be CALL PROCEEDING message. Only Public CS which can confirm the consistence of end-to-end connection sends this message. (The consistency can be confirmed by receiving a response from personal station (PS).)	In order not to receive invalid messages, the conditions of sending this message from Public CS are defined.
8) Action of Public CS which cannot confirm end-to-end call connection	Public CS which could not confirm end-to-end call connection, releases call reference and does not send any messages to digital network.	In order to avoid the invalid messages for incoming call
9) Circuit-switched call control procedures	(1) The description of overlap sending and overlap receiving are deleted. (2) The description of transit network selection, call rearrangements, bearer capability selection, and high layer capability selection are deleted. (3) Channel negotiation procedure is deleted.	(1), (2) They are not applied in this standard. (3) In normal incoming call and outgoing call, Public CS selects a channel.

Differences from JT-Q931

Item	Differences between JT-Q931 and this Standard	Reasons
10) The deletion of the information elements from messages	(1)Bearer capability information element is deleted from each ALERTING, CALL PROCEEDING,CONNECT, and PROGRESS message. (2)Bearer capability information element is deleted from NOTIFY message. (3) Channel identification information element is deleted from each ALERTING and CONNECT message.	(1)(2) Because Bearer capability information element in these messages is used for the selection of bearer capability and the selection of bearer capability is not provided in this standard. (3)These message are not the first response to SETUP message.
11) SETUP message	Calling party number information element in out going call from Public CS, and Called party number information element in incoming/outgoing call to/from Public CS are mandatory.	Because Calling party number information element in outgoing call is used for specifying a calling side. Because Called party number information element in outgoing call is used for specifying a remote side. Because Called party number information element in incoming call is used for specifying a called side.
12) Call reference information element	Length of call reference value is fixed to 2 octets.	Because large number of incoming calls are valid simultaneously.
13) Call state information element	Remove (1) C2/N2 (Overlap sending) and C25/N25(Overlap receiving); (2) C15/N15 (Suspend request), and C17/N17 (Resume request).	(1) Overlap sending and overlap receiving procedures are not provided in this standard. (2) Call rearrangement is not provided in this standard.

Table
Differences from JT-Q931

Item	Differences between JT-Q931 and this Standard	Reasons
14) Calling/Called party number information element	. Type of number Specify only international number / national number / network specific number / reserved for extension / spare. . Numbering plan Specify only ISDN / telephony numbering plan / national standard numbering plan / private numbering plan / reserved for extension / spare.	Other values of Type of number and Numbering plan are not provided in this standard.
15) Channel identification information element	The description with relation to primary rate interface is deleted.	The primary rate interface is not provided in this standard.
16) Progress indicator information element	Regarded as ISDN on internetwork interworking.	To make the interworking with other network clear.
17) Coding standard	As for the following coding standards, the description namely "ITU-T standardized coding" is deleted from: - Bearer capability information element - Call state information element - Channel identification information element - Progress indicator information element	This document covers only TTC Standards.

Item	Differences between JT-Q931 and this Standard	Reasons
18) Timer	(1) The following timers are deleted on the digital network side: T302(Overlap sending procedure) T304(Overlap receiving procedure) T307(Call rearrangement procedure) (2)The following timers are deleted on the Public CS side: T302(Overlap receiving procedure) T304(Overlap sending procedure) T318,319(Call rearrangement procedure) (3)T303 on digital network side is changed to 4 or 5 seconds.	(1) These timers are required for the functions which are not provided in this standard. (2) ditto (3)It depends on the requirements of public CS.
19) Constraints in incoming call	(1)Information channel selection in incoming call to Public CS is constrained as follows: 1) Information channel selection field indicates "B1 channel" or "B2 channel", and Preferred/ Exclusive field indicates "exclusive", or 2) Information channel selection field indicates "any channel", and Preferred/Exclusive field indicates "indicated channel is preferred". (2)If there is no response for retransmitted SETUP message, cause No.20 "subscriber absent" is sent to a calling user. (3) Only when End to End communication is valid, Public CS, which has received unprovidable bearer, transmits cause No.65 “Bearer service not implemented” to remote side. (4)The local action of the Public CS is not described.	(1)Channel is hunted on public CS side. (2)This cause value indicates that a personal station has been logged off, or a PHS user is temporarily not addressable at any user-network interface. (3) This change clarifies the case when the absence of the subscriber, which is particular in personal communication, and incoming call with unprovidable bearer occur simultaneously. (4)It was decided to be unnecessary for public CS because the description is the local matter for the terminal.

Item	Differences between JT-Q931 and this Standard	Reasons
	(5)The description of section 5.2.9 “Non-selected user clearing” is changed and moved to Appendix VII “call procedure for the grouped multiple interfaces".	(5) The connection is limited to the point to point.
20) Annex A : Public CS side and digital network side SDL diagrams	Updated according to the above modifications.	
21) Annex C : Transit network selection	Deleted.	It is not provided in this standard.
22) Annex D : Extensions for symmetric call operation	Deleted.	Not needed.
24) Annex E : Network-specific facility selection	Deleted.	It is not provided in this standard.
24) Annex F : D-channel backup procedures	Deleted.	It is not provided in this standard.
25) Annex G : Use of progress indicators	Deleted.	Not needed.
26) Annex H : Message segmentation procedures	Updated according to the above modifications.	

Item	Differences between JT-Q931 and this Standard	Reasons
27) Annex K : Procedures for establishment of bearer connection prior to call acceptance	Deleted.	It is not provided in this standard.
28) Annex L : Optional procedures for bearer service change	Deleted.	It is not provided in this standard.
29) Annex M : Additional basic call signalling requirements for the support of private network inter-connection for Virtual Private Network applications	Deleted.	It is not provided in this standard.
30) Annex N: Flexible channel selection	Deleted.	It is not provided in this standard.
31) Appendix I : Usage of cause values	Cause No.20 “Subscriber Absent” is added.	Cause for personal communications.
32) Appendix II : Example message flow diagrams and example conditions for cause mapping	Deleted.	It is not provided in this standard.

Item	Differences between JT-Q931 and this Standard	Reasons
33) Appendix III : Summary of assigned information element identifier and message type code points for the Q.93x-Series and Q.95x-Series of Recommendations	No change.	
34) Appendix VII: Incoming call to multiple interface in groups	Description which exceeds a range of interface specification is collected as an appendix.	The contents exceed a range of interface specification, but are necessary for clarification.
35) NOTIFY message	This message can be applied only in digital network → public CS direction.	It is not provided in this standard in opposite direction.
36) Call reference number	Dummy Call reference number is not used.	It is not provided in this standard.
37) Progress indicator information element	"private network serving the local user" is deleted.	The configuration that Public CS serves private network is not defined.