・ ＪＴ－Ｑ９３１－ａ
・ Digital Interface between PBXs (common channel signaling)
  -Layer 3 specification-

1.Relationship with international standards
   The TTC JT-Q931-a standard describes the Layer 3 specification applicable to
PBX-to-PBX digital interfaces, based on the third edition of the TTC JT-Q931
standard established in April 1989.

2.Summary of departure from international standards
   Items deleted and/or modified corresponding to the above standards are described
below.
   (1) §2. Overview of call control
      (a)   Definitions of the terms used in this standard are added to make the
            TTC JT-Q931 standard applicable to the PBX-to-PBX interface.
      (b)   Call states are unified from Uxx, Nxx, to Pxx in this standard.
      (c)   Call states related to the following items are for further study.
            - Overlap sending, overlap receiving, and call abort
            - Packet-mode access connections
            - Temporary signaling connections
      (d)   States related to suspend/resume are deleted because these are not used
            in the PBX-to-PBX interface.
   (2) §3. Message functional definitions and content
      (a)   Definitions of message significance are modified as follows.
            - Local significance, i.e., relevant only to associating PBXs
            - Global significance, i.e., relevant to the originating, destination,
              and transit PBX

          Note: Access and dual significances are deleted because there is no
                corresponding significance to PBX-to-PBX interfaces.
      (b)   The type of channel identification information element included in the
            SETUP message is changed from optional to mandatory, because "any
            channel"
            information selection is prohibited in channel negotiation procedure.
      (c)   A CALL PROCEEDING message should be always returned as a first
            Message in response to a SETUP message.   The progress indicator
            information element is also deleted from this message because the
            significance of a CALL PROCEEDING message is not global.
      (d)   As a result of (c), the channel identification information element is
            deleted from ALERTING, CONNECT, and CONNECT ACKNOWLEDGE
            messages.
      (e)   The Progress indicator information element is deleted from the
            DISCONNECT message because the PROGRESS message used instead of
            the DISCONNECT message contains progress indicator No.8 in-band

information or an appropriate pattern now available.
 (f) SUSPEND, SUSPEND ACKNOWLEDGE, SUSPEND REJECT, RESUME, RESUME ACKNOWLEDGE,and RESUME REJECT messages are deleted, because suspend/resume procedures are not used in the PBX-to-PBX interface.
 (g) A Traveling class mark (TCM) information element is added to the SETUP message to support connection restriction services.
 (h) Messages related to the following items are for further study.
   - Overlap sending, overlap receiving, and call abort
   - Packet-mode access connections
   - Temporary signaling connections
(3) § 4. General message format and information element coding
 (a) The information elements specified in this standard are the same as TTC standard JT-Q931.   In the course of applying them to the PBX-to-PBX interface, clarification of usage and possible amendment to this standard are planned…perhaps with the addition of supplements.
 (b) The code point of the protocol discriminator is newly assigned for the

   PBX-to-PBX interface as the third value for national use, considering the differences of services and network configurations from JT-Q931, and future expansion of this protocol.
 (c) The use of code set 7 is for further study.
 (d) The traveling class mark information element is newly assigned using code set 5 to avoid overlapping with the code point of JT-Q931.
 (e) The coding standard of the TCM information element is defined as follows.
   00   this standard
   11   standard defined for the specific interface
   01   reserved
   10   reserved
 (f) Repetition of the channel identification information element is not specified because its usage is not clear.   The information elements such as the shift, cause, and progress indicators are allowed to be repeated because the usage is clear.   The repetition of information elements related to supplementary services such as bearer capability, low layer compatibility, and high layer compatibility are for further study.
 (g) The necessity of peculiar cause for private networks requires further study.
 (h) The description on the dummy call reference is added according to the completion of JJ-20.23.
(4) § 5. Circuit-switched call control procedures
 (a) The terms, "user" and "network" are changed in accordance with the definition of terms in § 2.
 (b) The names of call states has been examined and changed based on § 2.
 c(a) The CONNECT ACKNOWLEDGE message has been made optional

because there is no need to be mandatory in the PBX-to-PBX interface.

d(a) The CALL PROCEEDING message has been made mandatory considering the transmission delay, which varies according to the terminal or number of the transit PBX.

(e) The necessity of transferring unrecognized messages or information elements requires further study to achieve service expandability in private networks.

(f) The procedures such as overlap sending, overlap receiving, and transit network selection are for further study.

(5) From §6. through §8.

(a) §6. Packet communications procedures and §7. User-to-user signaling procedures are for further study.

(b) §8. The application of circuit-switched supplementary services to terminals using stimulus procedures is deleted.

(6) §9. List of system parameters

(a) A symmetrical procedure is applied to the PBX-to-PBX protocol. Therefore, timers are unified for PBX-to-PBX instead of distinguishing between the network side and the user side. T303 is also determined to be mandatory.

(b) T301 and T310 are deleted because watching at the call received and incoming call proceeding states is done at originating or terminating access but not between PBXs.

(c) T302 and T304, related to overlap sending, are for further study.

(d) T306 is deleted because the PROGRESS message is used for tone/announcement.

(e) The timers related to the suspend/resume procedures such as T307, T318, and T319 are deleted. Also, T312, for the broadcast call setup procedure, is deleted.

(f) T313 is deleted because the CONNECT ACKNOWLEDGE message is decided to be optional.

(g) T314 for message segmentations,and T320 for packet communications will be further studied.

(h) A PBX may keep a call even if T309 expires, considering the situation that a call connection path can be maintained if the data link goes out of order.

(7) Others (Annex,Appendix)

(a) As for Annex B,titled "Compatibility checking in the private network", it is described that the called party number IE and the bearer capability IE are used for compatibility checking,and the high layer/low layer compatibility IE's and the progress indicator IE are transfered primarily unchanged between PBX's.

(b) As for Annex D and N,the main body of this standard is to be referred.

(c) As for Annex G,causes #26 for point-to-multipoint cofiguration,#83,

#84,#85,and #86 for suspend/resume procedure,are deleted.
(d) As for Annex H,coding examples for packet mode access and basic access interface are deleted,and the coding example using "any channel" codepoint is replaced by that of "indicated channel" codepoint.
(e) As for Annex I,the example of interworking with the private ISDN is shown, and the description regarding interworking with a non-ISDN terminal connected to a NT2.
(f) As for Annex J,annex J of the standard JT-Q931 is referred directly.
(g) As for Annex L and M,there is nothing to do with this standard.
(h) Annexes C,E,K,O,and appendix ・ are left for further study.
(i) As for Annex F,in applying annex F of the standard JT-Q931 to PBX to PBX interfaces,adjustment of terms such as "user""network""primary rate access" ,and ammendment to the supplement in order to clarify the discrmination method of the interface has been done.
(j) As for appendix I,causes #26,#83,#84,#85,and #86 are deleted form the same reason as for Annex G. And causes corresponding to items for further study are left for further study.
(k) As for appendix ・,messages for further study are noted clearly.
(l) Supplement to this standard is provided to supple the main body.

3. History of revision

Version No.	Date	Outline
1st version	April 25,1990	Established
version 2	November 28,1990	
version 3	April 28,1992	
version 4	April 27,1993	
version 5	November 26,1993	
version 5.1	June 3,1997	

4. Others
(1) Standards of Reference

TTC standards;
    JT-I431,JT-Q921,JT-Q931
    JJ-20.20,JJ-20.21,JJ-20.22
    JT-I431-a,JT-I431-c,JT-Q921-a