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Amendment 1
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SERIES Q: SWITCHING AND SIGNALLING

Digital subscriber Signalling System No. 1 – Network layer

ISDN user-network interface layer 3 specification for
basic call control

**Amendment 1: Extensions for the support of
digital multiplexing equipment**

ITU-T Recommendation Q.931 (1998) – Amendment 1

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ITU-T Recommendation Q.931

ISDN user-network interface layer 3 specification for basic call control

Amendment 1

Extensions for the support of digital multiplexing equipment

Summary

This amendment contains the modifications to ITU-T Rec. Q.931 (05/98) in order to accommodate the needs of DME signalling and to correct an editorial error in the coding of the Bearer capability information element. Appendix III is added to provide typical DME control procedures.

NOTE – This amendment takes into account Erratum 1 to Q.931 (05/1998) which corrects the editorial error for the coding of octet 5d (bit 1) of the V.32 Bearer capability information element in Table 4-6/Q.931.

Source

Amendment 1 to ITU-T Recommendation Q.931 (1998) was prepared by ITU-T Study Group 11 (2001-2004) and approved under the WTSA Resolution 1 procedure on 29 December 2002.

FOREWORD

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In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

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ITU-T Recommendation Q.931

ISDN user-network interface layer 3 specification for basic call control

Amendment 1

Extensions for the support of digital multiplexing equipment

1) **Table 4-3**

Add a new information element for DME signalling as follows:

Table 4-3/Q.931 – Information element identifier coding

	Reference subclause	Maximum length (octets) (Note 1)
Bits <u>8 7 6 5 4 3 2 1</u>		
0 : : : : : : : : <i>Variable length information element:</i>		
<u>0 0 1 1 0 1 1</u> <u>Coding decoding processing</u>	<u>Appendix III</u>	<u>(Note 4)</u>

2) **Figure 4-11**

Apply corrections to Figure 4-11/Q.931 as follows:

	8	7	6	5	4	3	2	1	Octet
	Bearer capability information element identifier								
	0	0	0	0	0	1	0	0	1
	Length of the bearer capability contents								2
ext.	Coding standard				Information transfer capability				3
ext.	Transfer mode				Information transfer rate				4
ext.	Rate multiplier								4.1* (Note 1)
ext.	Layer 1 ident.		User information layer 1 protocol						5*
	0	1							
ext.	Synch./ asynch	Negot.	User rate						5a* (Note 2)
ext.	Intermediate rate		NIC on Tx	NIC on Rx	Flow control on Tx	Flow control on Rx	Spare 0		5b* (Note 3)
ext.	Hdr/ no Hdr	Multiframe	Mode	LLI negot.	Assignor/ee	In-band neg.	Spare 0		5b* (Note 4)
ext.	Number of stop bits		Number of data bits			Parity			5c* (Note 2)
ext.	Duplex mode	Modem type							5d* (Note 2)
ext.	Layer 2 ident.		User information layer 2 protocol						6*
	1	0							
ext.	Layer 3 ident.		User information layer 3 protocol						7*
	1	1							
ext.	Spare			Additional layer 3 protocol information (most significant bits)					7a* (Note 5)
	0	0	0						
ext.	Spare			Additional layer 3 protocol information (most significant bits)					7b* (Note 5)
	0	0	0						

NOTE 1 – This octet is required if octet 4 indicates multirate (64 kbit/s base rate). Otherwise, it shall not be present.

NOTE 2 – This octet may be present if octet 3 indicates *unrestricted digital information* and octet 5 indicates either of the ITU-T standardized rate adaptations V.110, I.460 and X.30 or V.120 [9]. It may also be present if octet 3 indicates 3.1 kHz audio and octet 5 indicates G.711.

NOTE 3 – This structure of octet 5b only applies if octet 5 indicates ITU-T standardized rate adaption (see Recommendations V.110 [7], I.460 [15] and X.30 [8]).

NOTE 4 – This structure of octet 5b only applies if octet 5 indicates ITU-T standardized rate adaption (see Recommendation V.120 [9]).

NOTE 5 – This octet may be included if octet 7 indicates ISO/IEC TR 9577 (Protocol Identification in the network layer).

Figure 4-11/Q.931 – Bearer capability information element

3) **Table 4-6**

Modify Table 4-6/Q.931 as follows:

Table 4-6/Q.931 – Bearer capability information element

<i>Coding standard (octet 3)</i>					
Bits					
<u>7</u>	<u>6</u>				
0	0	ITU-T standardized coding as described below			
0	1	ISO/IEC Standard (Note 1)			
1	0	National standard (Note 1)			
1	1	Standard defined for the network (either public or private) present on the network side of the interface (Note 1)			
NOTE 1 – These other coding standards should be used only when the desired bearer capability cannot be represented with the ITU-T-standardized coding.					
<i>Information transfer capability (octet 3)</i>					
Bits					
<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	
0	0	0	0	0	Speech
0	1	0	0	0	Unrestricted digital information
0	1	0	0	1	Restricted digital information
1	0	0	0	0	3.1 kHz audio
1	0	0	0	1	Unrestricted digital information with tones/announcements (Note 2)
1	1	0	0	0	Video
All other values are reserved.					
NOTE 2 – Unrestricted digital information with tones/announcements (UDI-TA) is the new information transfer attribute value that had previously been named "7 kHz audio" in Recommendation Q.931 (1988).					
<i>Transfer mode (octet 4)</i>					
Bits					
<u>7</u>	<u>6</u>				
0	0	Circuit mode			
1	0	Packet mode			
All other values are reserved.					
<i>Information transfer rate (octet 4 , bits 5 to 1)</i>					
Bits					
<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	
0	0	0	0	0	<i>Circuit mode</i> –
1	0	0	0	0	64 kbit/s
1	0	0	0	1	2 × 64 kbit/s
1	0	0	1	1	384 kbit/s
1	0	1	0	1	1536 kbit/s
1	0	1	1	1	1920 kbit/s
1	1	0	0	0	Multirate (64 kbit/s base rate)
All other values are reserved.					
<i>Packet-mode</i> This code shall be used for packet-mode calls					

Table 4-6/Q.931 – Bearer capability information element

NOTE 3 – When the information transfer rate 2×64 kbit/s is used, the coding of octets 3 and 4 refer to both 64 kbit/s channels.

NOTE 4 – Additional attributes are defined in Table 4-7.

Rate multiplier (octet 4.1)

NOTE 5 – Coded as a binary representation of the multiplier to the base rate. The multiplier can take any value from 2 up to the maximum number of B-channels available on the interface.

User information layer 1 protocol (octet 5)

Bits

5 4 3 2 1

- 0 0 0 0 1 ITU-T standardized rate adaption V.110, I.460 and X.30. This implies the presence of octet 5a and optionally octets 5b, 5c and 5d as defined below
- 0 0 0 1 0 Recommendation G.711 [10] μ -law
- 0 0 0 1 1 Recommendation G.711 A-law
- 0 0 1 0 0 Recommendation G.721 [11] 32 kbit/s ADPCM and Recommendation I.460
- 0 0 1 0 1 Recommendations H.221 and H.242
- 0 0 1 1 0 Recommendations H.223 [92] and H.245 [93]
- 0 0 1 1 1 Non-ITU-T standardized rate adaption. This implies the presence of octet 5a and, optionally, octets 5b, 5c and 5d. The use of this codepoint indicates that the user rate specified in octet 5a is defined by the user. Additionally, octets 5b, 5c and 5d, if present, are defined in accordance with the user specified rate adaption
- 0 1 0 0 0 ITU-T standardized rate adaption V.120 [9]. This implies the presence of octets 5a and 5b as defined below, and optionally octets 5c and 5d
- 0 1 0 0 1 ITU-T standardized rate adaption X.31 [14] HDLC flag stuffing
- 0 1 0 1 0 Recommendation G.728 [98] LD-CELP (Note 7)
- 0 1 0 1 1 Recommendation G.729 [99] CS-ACELP (Note 7)

All other values are reserved.

NOTE 6 – If the transfer mode is "circuit mode", and if the information transfer capability is "unrestricted digital information" or "restricted digital information", and if the user information layer 1 protocol is to be identified only to the addressed entity octet 5 shall be omitted. If the transfer mode is packet mode, octet 5 may be omitted. Otherwise, octet 5 shall be present.

NOTE 7 – These codings can only be used in ISUP [100] User Service Information Parameter

Synchronous/Asynchronous (octet 5a)

Bit

7

- 0 Synchronous data
- 1 Asynchronous data

NOTE 78 – Octets 5b-5d may be omitted in the case of synchronous user rates.

Negotiation (octet 5a)

Bit

6

- 0 In-band negotiation not possible
- 1 In-band negotiation possible

NOTE 89 – See Recommendations V.110 [7], I.460 [15] and X.30 [8] or modem type Recommendation.

Table 4-6/Q.931 – Bearer capability information element

<i>User rate (octet 5a)</i>					
Bits					
<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	
0	0	0	0	0	For I.460, rate is specified by bits 7, 6 of octet 5b, intermediate rate. For V.110 and X.30, rate is indicated by E-bits (synchronous data only) or may be negotiated in-band. For V.120, rate is unspecified or may be negotiated in-band.
0	0	0	0	1	0.6 kbit/s Recommendation X.1 [17]
0	0	0	1	0	1.2 kbit/s
0	0	0	1	1	2.4 kbit/s Recommendation X.1
0	0	1	0	0	3.6 kbit/s
0	0	1	0	1	4.8 kbit/s Recommendation X.1
0	0	1	1	0	7.2 kbit/s
0	0	1	1	1	8 kbit/s Recommendation I.460
0	1	0	0	0	9.6 kbit/s Recommendation X.1
0	1	0	0	1	14.4 kbit/s
0	1	0	1	0	16 kbit/s Recommendation I.460
0	1	0	1	1	19.2 kbit/s
0	1	1	0	0	32 kbit/s Recommendation I.460
0	1	1	0	1	38.4 kbit/s Recommendation V.110 [87]
0	1	1	1	0	48 kbit/s Recommendations X.1
0	1	1	1	1	56 kbit/s
1	0	0	1	0	57.6 kbit/s Recommendation V.14 extended [88]
1	0	0	1	1	28.8 kbit/s Recommendation V.110 [89]
1	0	1	0	0	24 kbit/s Recommendation V.110 [89]
1	0	1	0	1	0.1345 kbit/s Recommendation X.1
1	0	1	1	0	0.100 kbit/s Recommendation X.1
1	0	1	1	1	0.075/1.2 kbit/s Recommendation X.1 (Note 910)
1	1	0	0	0	1.2/0.075 kbit/s Recommendation X.1 (Note 910)
1	1	0	0	1	0.050 kbit/s Recommendation X.1
1	1	0	1	0	0.075 kbit/s Recommendation X.1
1	1	0	1	1	0.110 kbit/s Recommendation X.1
1	1	1	0	0	0.150 kbit/s Recommendation X.1
1	1	1	0	1	0.200 kbit/s Recommendation X.1
1	1	1	1	0	0.300 kbit/s Recommendation X.1
1	1	1	1	1	12 kbit/s
All other values are reserved.					
NOTE 910 – The first rate is the transmit rate in the forward direction of the call. The second rate is the transmit rate in the backward direction of the call.					

Table 4-6/Q.931 – Bearer capability information element

<i>Octet 5b for V.110, I.460 and X.30 rate adaption</i>	
<i>Intermediate rate (octet 5b)</i>	
Bits	
<u>7</u> 6	
0 0	Not used
0 1	8 kbit/s
1 0	16 kbit/s
1 1	32 kbit/s
<i>Network Independent Clock (NIC) on transmission (Tx) (octet 5b) (Note 4011)</i>	
Bit	
<u>5</u>	
0	Not required to send data with network independent clock
1	Required to send data with network independent clock
NOTE 40 11 – Refers to transmission in the forward direction of the call.	
NOTE 41 12 – See Recommendations V.110 [7], I.460 [15] and X.30 [8].	
<i>Network Independent Clock (NIC) on reception (Rx) (octet 5b) (Note 4213)</i>	
Bit	
<u>4</u>	
0	Cannot accept data with network independent clock (i.e. sender does not support this optional procedure).
1	Can accept data with network independent clock (i.e. sender does support this optional procedure).
NOTE 42 13 – Refers to transmission in the backward direction of the call.	
NOTE 43 14 – See Recommendations V.110 [7], I.460 [15] and X.30 [8].	
<i>Flow control on transmission (Tx) (octet 5b) (Note 4415)</i>	
Bit	
<u>3</u>	
0	Not required to send data with flow control mechanism
1	Required to send data with flow control mechanism
NOTE 44 15 – Refers to transmission in the forward direction of the call.	
NOTE 45 16 – See Recommendations V.110, I.460 and X.30.	
<i>Flow control on reception (Rx) (octet 5b) (Note 4617)</i>	
Bit	
<u>2</u>	
0	Cannot accept data with flow control mechanism (i.e. sender does not support this optional procedure)
1	Can accept data with flow control mechanism (i.e. sender does support this optional procedure)
NOTE 46 17 – Refers to transmission in the backward direction of the call.	
NOTE 47 18 – See Recommendations V.110, I.460 and X.30.	

Table 4-6/Q.931 – Bearer capability information element

<i>Octet 5b for V.120 [9] rate adaption</i>	
<i>Rate adaption header/no header (octet 5b)</i>	
Bit	
<u>7</u>	
0	Rate adaption header not included
1	Rate adaption header included
<i>Multiple frame establishment support in data link (octet 5b)</i>	
Bit	
<u>6</u>	
0	Multiple frame establishment not supported. Only UI frames allowed
1	Multiple frame establishment supported
<i>Mode of operation (octet 5b)</i>	
Bit	
<u>5</u>	
0	Bit transparent mode of operation
1	Protocol sensitive mode of operation
<i>Logical link identifier negotiation (octet 5b)</i>	
Bit	
<u>4</u>	
0	Default, LLI = 256 only
1	Full protocol negotiation (Note 48 19)
NOTE 48 19 – A connection over which protocol negotiation will be executed is indicated in bit 2 of octet 5b.	
<i>Assignor/assignee (octet 5b)</i>	
Bit	
<u>3</u>	
0	Message originator is "Default assignee"
1	Message originator is "Assignor only"
<i>In-band/out-band negotiation (octet 5b)</i>	
Bit	
<u>2</u>	
0	Negotiation is done with USER INFORMATION messages on a temporary signalling connection
1	Negotiation is done in-band using logical link zero
<i>Number of stop bits (octet 5c)</i>	
Bits	
<u>7 6</u>	
0 0	Not used
0 1	1 bit
1 0	1.5 bits
1 1	2 bits

Table 4-6/Q.931 – Bearer capability information element

<i>Number of data bits excluding parity Bit if present (octet 5c)</i>	
<u>5 4</u>	
0 0	Not used
0 1	5 bits
1 0	7 bits
1 1	8 bits
<i>Parity information (octet 5c)</i>	
Bits	
<u>3 2 1</u>	
0 0 0	Odd
0 1 0	Even
0 1 1	None
1 0 0	Forced to 0
1 0 1	Forced to 1
All other values are reserved.	
<i>Mode duplex (octet 5d)</i>	
Bit	
<u>7</u>	
0	Half duplex
1	Full duplex
<i>Modem type (octet 5d)</i>	
Bits	
<u>6 5 4 3 2 1</u>	
0 0 0 0 0 0	National use
through	
0 0 0 1 0 1	
0 1 0 0 0 1	Recommendation V.21 [55]
0 1 0 0 1 0	Recommendation V.22 [56]
0 1 0 0 1 1	Recommendation V.22 <i>bis</i> [57]
0 1 0 1 0 0	Recommendation V.23 [58]
0 1 0 1 0 1	Recommendation V.26 [59]
0 1 0 1 1 0	Recommendation V.26 <i>bis</i> [60]
0 1 0 1 1 1	Recommendation V.26 <i>ter</i> [61]
0 1 1 0 0 0	Recommendation V.27 [62]
0 1 1 0 0 1	Recommendation V.27 <i>bis</i> [63]
0 1 1 0 1 0	Recommendation V.27 <i>ter</i> [64]
0 1 1 0 1 1	Recommendation V.29 [65]
0 1 1 1 0 0	Recommendation V.32 [66]
0 1 1 1 1 0	Recommendation V.34 [90]

Table 4-6/Q.931 – Bearer capability information element

1 0 0 0 0 0
through National use

1 0 1 1 1 1

1 1 0 0 0 0
through User specified

1 1 1 1 1 1

All other values reserved.

User information layer 2 protocol (octet 6)

Bits

5 4 3 2 1

0 0 0 1 0 Recommendation Q.921/I.441 [3]

0 0 1 1 0 Recommendation X.25 [5], link layer

0 1 1 0 0 LAN logical link control (ISO/IEC 8802-2) (Note ~~23~~24)

All other values are reserved.

NOTE ~~49~~20 – If the transfer mode is "packet mode", octet 6 shall be present. For other cases, if the user layer 2 protocol is to be identified to the network, then octet 6 shall be present; otherwise octet 6 shall be omitted.

User information layer 3 protocol (octet 7)

Bits

5 4 3 2 1

0 0 0 1 0 Recommendation Q.931

0 0 1 1 0 Recommendation X.25, packet layer

0 1 0 1 1 ISO/IEC TR 9577 [82] (Protocol identification in the network layer) (Notes ~~24~~22 and ~~23~~24)

All other values are reserved.

NOTE ~~20~~21 – If the user information layer 3 protocol is to be identified to the network, octet 7 shall be present; otherwise octet 7 shall be omitted.

NOTE ~~24~~22 – If the user information layer 3 protocol indicates "Network layer protocol identification", octet 7a and 7b may be included to identify the actual user information layer 3 protocol to the network.

Octets 7a and 7b (Notes ~~24~~22 and ~~22~~23)

Bit 8 (ext.) set to 0 in octet 7a and set to 1 in octet 7b.

Bits 7 to 5 are spare (set to 0) in both octets.

7a

7b

Bits

Bits

4 3 2 1

4 3 2 1

1 1 0 0

1 1 0 0

Internet Protocol (RFC 791) (ISO/IEC TR 9577 [82])

1 1 0 0

1 1 1 1

Point-to-point Protocol (RFC 1548)

NOTE ~~22~~23 – If the user information layer 3 protocol indicates "Network layer protocol Identification", octet 7a and 7b may be included to identify the actual user information layer 3 protocol to the network. These codepoints are assigned consistently with ISO/IEC TR 9577 [82].

NOTE ~~23~~24 – These codings can only be used where transfer mode is "circuit mode".

4) New Appendix III

Add a new Appendix III as follows:

Appendix III

Signalling for tandem mode operation of Digital Multiplexing Equipment with Low-bit-rate Voice CODEC (DME with LVC)

III.1 Scope

This appendix describes the signalling for tandem mode operation of Digital Multiplexing Equipment with Low-bit-rate Voice CODEC (DME with LVC) in circuit-mode connection control. The scope of this appendix is for DSS1 to exchange information on the voice compression applied within preceding section so that the receiving network can know the information for controlling tandem mode operation of DME with LVC in case of interworking with DSS1 network. The process controlling tandem mode operation of DME with LVC in ISDN section by using e.g. ISUP [100] procedure is out of the scope of this appendix.

III.2 Coding requirement

III.2.1 Messages

III.2.1.1 SETUP message

Table III.1/Q.931 – SETUP message content

Message type: SETUP Significance: Global Direction: Both				
Information element	Reference (clause)	Direction	Type	Length
Coding Decoding Processing	III.2.2	Both	O (Note)	2-*
Other information elements as described in Table 3-15				
NOTE – Included if the voice call has been compressed in preceding network.				

III.2.2 Information elements

III.2.2.1 Coding decoding processing information element

The purpose of the Coding Decoding Processing information element is to transfer the information on voice compression applied within the preceding section to succeeding section by DSS1. This information element indicates whether the voice call has been compressed and, if so, the type of voice compression used as well.

The Coding Decoding Processing information element is coded as shown in Figure III.1 and Table III.2.

The n th octet (Note) of this information element shows the type of voice compression and enabling/disabling of compression/decompression regarding the $n-2$ th pair(s) of DME(s) with LVC, and the maximum length of this information element is network dependent.

NOTE – n is greater than or equal to 3.

8	7	6	5	4	3	2	1	Octet
Coding Decoding Processing information element identifier								
0	0	0	1	1	0	1	1	1
Length of Coding Decoding Processing contents								2
Compression status indicator	Type of voice compression							3
Compression status indicator	Type of voice compression							N

Figure III.1/Q.931 – Coding decoding processing information element

Table III.2/Q.931 – Coding decoding processing information element

<i>Compression status indicator (octet n)</i>	
Bits	
<u>8</u>	
0	Decompressed
1	Compressed
 <i>Type of voice compression (octet n)</i>	
Bits	
<u>7 6 5 4 3 2 1</u>	
0 0 0 0 0 1 0	Recommendation G.711 [10] μ -law
0 0 0 0 0 1 1	Recommendation G.711 A-law
0 0 0 0 1 0 0	Recommendation G.726 32 kbit/s ADPCM
0 0 0 1 0 1 0	Recommendation G.728 [98] LD-CELP
0 0 0 1 0 1 1	Recommendation G.729 [99] CS-ACELP
All other values are reserved.	

III.3 Procedures

III.3.1 Procedures at the originating interface

If the user knows the voice compression applied within the preceding section, it may send Coding Decoding Processing information element with voice compression information in SETUP message to the network across the user-network interface.

If the network receives Coding Decoding Processing information element from the user, it may send the information to succeeding section.

III.3.2 Procedures at the destination interface

If the network knows the voice compression applied within the preceding section(s), it may send Coding Decoding Processing information element with voice compression information in SETUP message to the user across the user-network interface.

If the user receives Coding Decoding Processing information element from the network, it may send this information to succeeding section.

5) Revised Appendix IV

Change the number of Appendix III to Appendix IV and modify as follows:

Appendix HHIV

Summary of assigned information element identifier and message type code points for the Q.93.x series and Q.95.x series of Recommendations

Table HHIV.1/Q.931 – Information element codepoints

	Recommendation reference
Bits	
<u>8 7 6 5 4 3 2 1</u>	
1 : : : - - - - <i>Single octet information elements:</i>	
0 0 0 - - - - Reserved	Q.931
0 0 1 - - - - Shift	Q.931
0 1 0 0 0 0 0 More data	Q.931
0 1 0 0 0 0 1 Sending complete	Q.931
0 1 1 - - - - Congestion level	Q.931
1 0 1 - - - - Repeat indicator	Q.931
0 : : : : : : : <i>Variable length information elements:</i>	
0 0 0 0 0 0 0 Segmented message	Q.931
0 0 0 0 1 0 0 Bearer capability	Q.931
0 0 0 1 0 0 0 Cause	Q.931
0 0 0 1 1 0 0 Connected address	(Note 1)
0 0 0 1 1 0 1 Extended facility	Q.932
0 0 1 0 0 0 0 Call identity	Q.931
0 0 1 0 1 0 0 Call state	Q.931
0 0 1 1 0 0 0 Channel identification	Q.931
0 0 1 1 0 0 1 Data link connection identifier	Q.933
<u>0 0 1 1 0 1 1</u> <u>Coding decoding processing</u>	<u>Q.931</u>
0 0 1 1 1 0 0 Facility	Q.932
0 0 1 1 1 1 0 Progress indicator	Q.931
0 1 0 0 0 0 0 Network-specific facilities	Q.931
0 1 0 0 1 0 0 Terminal capabilities	(Note 1)
0 1 0 0 1 1 1 Notification indicator	Q.931
0 1 0 1 0 0 0 Display	Q.931
0 1 0 1 0 0 1 Date/time	Q.931

Table HIV.1/Q.931 – Information element codepoints

		Recommendation reference
0 1 0 1 1 0 0	Keypad facility	Q.931
0 1 1 0 0 0 0	Keypad echo	(Note 1)
0 1 1 0 0 1 0	Information request	Q.932 [4]
0 1 1 0 1 0 0	Signal	Q.931
0 1 1 0 1 1 0	Switchhook	(Note 1)
0 1 1 1 0 0 0	Feature activation	Q.932
0 1 1 1 0 0 1	Feature indication	Q.932
0 1 1 1 0 1 0	Service profile identification	Q.932
0 1 1 1 0 1 1	Endpoint identifier	Q.932
1 0 0 0 0 0 0	Information rate	Q.931
1 0 0 0 0 0 1	Precedence level	Q.955 (clause 3)
1 0 0 0 0 1 0	End-to-end transit delay	Q.931
1 0 0 0 0 1 1	Transit delay selection and indication	Q.931
1 0 0 0 1 0 0	Packet layer binary parameters	Q.931
1 0 0 0 1 0 1	Packet layer window size	Q.931
1 0 0 0 1 1 0	Packet size	Q.931
1 0 0 0 1 1 1	Closed user group	Q.931
1 0 0 1 0 0 0	Link layer core parameters	Q.933
1 0 0 1 0 0 1	Link layer protocol parameters	Q.933
1 0 0 1 0 1 0	Reverse charging indication	Q.931
1 0 0 1 1 0 0	Connected number	Q.951-series [85]
1 0 0 1 1 0 1	Connected subaddress	Q.951
1 0 1 0 0 0 0	X.213 priority	Q.933
1 0 1 0 0 0 1	Report type	Q.933
1 0 1 0 0 1 1	Link integrity verification	Q.933
1 0 1 0 1 1 1	PVC status	Q.933
1 1 0 1 1 0 0	Calling party number	Q.931
1 1 0 1 1 0 1	Calling party subaddress	Q.931
1 1 1 0 0 0 0	Called party number	Q.931
1 1 1 0 0 0 1	Called party subaddress	Q.931
1 1 1 0 1 0 0	Redirecting number	Q.931, Q.952 [86]
1 1 1 0 1 1 0	Redirection number	Q.952
1 1 1 1 0 0 0	Transit network selection	Q.931
1 1 1 1 0 0 1	Restart indicator	Q.931
1 1 1 1 1 0 0	Low layer compatibility	Q.931

Table HIV.1/Q.931 – Information element codepoints

	Recommendation reference
1 1 1 1 1 0 1 High layer compatibility	Q.931
1 1 1 1 1 1 0 User-user	Q.931
1 1 1 1 1 1 1 Escape for extension	Q.931
NOTE 1 – These codepoints are reserved to ensure backward compatibility with earlier versions of this Recommendation.	
NOTE 2 – All reserved values with bits 5-8 coded "0000" are for future information elements for which comprehension by the user is required (see 5.8.7.1).	

Table HIV.2/Q.931 – Message type codepoints

	Recommendation reference
Bits	
<u>8 7 6 5 4 3 2 1</u>	
0 0 0 0 0 0 0 0 Escape to nationally specific message types	Q.931
0 0 0 - - - - - <i>Call establishment messages:</i>	
0 0 0 0 1 ALERTING	Q.931
0 0 0 1 0 CALL PROCEEDING	Q.931
0 0 0 1 1 PROGRESS	Q.931
0 0 1 0 1 SETUP	Q.931
0 0 1 1 1 CONNECT	Q.931
0 1 1 0 1 SETUP ACKNOWLEDGE	Q.931
0 1 1 1 1 CONNECT ACKNOWLEDGE	Q.931
0 0 1 - - - - - <i>Call information phase messages:</i>	
0 0 0 0 0 USER INFORMATION	Q.931
0 0 0 0 1 SUSPEND REJECT	Q.931
0 0 0 1 0 RESUME REJECT	Q.931
0 0 1 0 0 HOLD	Q.932 [4]
0 0 1 0 1 SUSPEND	Q.931
0 0 1 1 0 RESUME	Q.931
0 1 0 0 0 HOLD ACKNOWLEDGE	Q.932
0 1 1 0 1 SUSPEND ACKNOWLEDGE	Q.931
0 1 1 1 0 RESUME ACKNOWLEDGE	Q.931
1 0 0 0 0 HOLD REJECT	Q.932
1 0 0 0 1 RETRIEVE	Q.932
1 0 0 1 1 RETRIEVE ACKNOWLEDGE	Q.932
1 0 1 1 1 RETRIEVE REJECT	Q.932

Table III.2/Q.931 – Message type codepoints

	Recommendation reference
0 1 0 - - - - - <i>Call clearing messages:</i>	
0 0 0 0 0 DETACH	(Note)
0 0 1 0 1 DISCONNECT	Q.931
0 0 1 1 0 RESTART	Q.931
0 1 0 0 0 DETACH ACKNOWLEDGE	(Note)
0 1 1 0 1 RELEASE	Q.931
0 1 1 1 0 RESTART ACKNOWLEDGE	Q.931
1 1 0 1 0 RELEASE COMPLETE	Q.931
0 1 1 - - - - - <i>Miscellaneous messages:</i>	
0 0 0 0 0 SEGMENT	Q.931
0 0 0 1 0 FACILITY	Q.932 [4]
0 0 1 0 0 REGISTER	Q.932
0 1 0 0 0 CANCEL ACKNOWLEDGE	(Note)
0 1 0 1 0 FACILITY ACKNOWLEDGE	(Note)
0 1 1 0 0 REGISTER ACKNOWLEDGE	(Note)
0 1 1 1 0 NOTIFY	Q.931
1 0 0 0 0 CANCEL REJECT	(Note)
1 0 0 1 0 FACILITY REJECT	(Note)
1 0 1 0 0 REGISTER REJECT	(Note)
1 0 1 0 1 STATUS ENQUIRY	Q.931
1 1 0 0 1 CONGESTION CONTROL	Q.931
1 1 0 1 1 INFORMATION	Q.931
1 1 1 0 1 STATUS	Q.931
NOTE – These codepoints are reserved to ensure backward compatibility with earlier versions of this Recommendation.	

III.1 Acronyms used in this Recommendation

ABM	Asynchronous Balanced Mode (of HDLC)
ACK	Acknowledgement
ADPCM	Adaptive Differential Pulse Code Modulation
AFI	Authority and Format Identifier
ARM	Asynchronous Response Mode (of HDLC)
AU	Access Unit
BC	Bearer Capability
BCD	Binary Coded Decimal
Bi	Indicated B-channel
Bi'	An idle B-channel Bi

Bj	A B-Channel in use
CEI	Connection Endpoint Identifier
CES	Connection Endpoint Suffix
CSPDN	Circuit Switched Public Data Network
D	The D-channel
DDI	Direct-Dialling-In
DLCI	Data Link Connection Identifier (see Recommendations Q.920 and Q.921)
<u>DME</u>	<u>Digital Multiplexing Equipment</u>
DSP	Domain Specific Part
DTE	Data Terminal Equipment
HDLC	High Level Data Link Control (procedures)
HLC	High Layer Compatibility
I	Information (frame)
IA5	International Alphabet No. 5 (defined by ITU-T)
IDI	Initial Domain Identifier
IE	Information Element
IEC	International Electrotechnical Commission
ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization
<u>ISUP</u>	<u>ISDN User Part</u>
IWF	Interworking Function
IWU	Interworking Unit
LAN	Local Area Network
LAPB	Link Access Protocol-Balanced
LAPD	Link Access Protocol on the D-channel
LLC	Low Layer Compatibility
LLI	Logical Link Identifier (see Recommendation Q.921)
<u>LVC</u>	<u>Low-bit-rate Voice CODEC</u>
NACK	Negative Acknowledgement
NIC	Network Independent Clock
NRM	Normal Response Mode (of HDLC)
NSAP	Network Service Access Point
NT2	Network Termination of type two
OSI	Open Systems Interconnection
PABX	Private Automatic Branch Exchange
PCM	Pulse Code Modulation

PH	Packet Handler
PSPDN	Packet Switched Public Data Network
PSTN	Public Switched Telephone Network
PVC	Permanent Virtual Circuit
RDTD	Restricted Differential Time Delay
RSC	Restart confirmation
RSI	Restart indication
RSR	Restart request
SABME	Set Asynchronous Balanced Mode Extended (frame)
SAPI	Service Access Point Identifier (see Recommendation Q.921)
SDL	Specification and Description Language
TA	Terminal Adaptor (see Recommendation I.411)
TE1	Terminal Equipment of type 1 (see Recommendation I.411)
TE2	Terminal Equipment of type 2 (see Recommendation I.411)
TEI	Terminal Endpoint Identifier (see Recommendations Q.920 and Q.921)
TID	Terminal identifier
UDI	Unrestricted Digital Information
UDI-TA	Unrestricted Digital Information with Tones/Announcements
UI	Unnumbered Information (frame)
USID	User Service Identifier
VC	(Switched) Virtual Circuit

III.2 References

- [98] ITU-T Recommendation G.728 (1992), Coding of speech at 16 kbit/s using low-delay code excited linear prediction.
- [99] ITU-T Recommendation G.729 (1996), Coding of speech at 8 kbit/s using conjugate-structure algebraic-code-excited linear prediction (CS-ACELP).
- [100] ITU-T Recommendation Q.761 (1999), Signalling System No. 7 – ISDN User Part functional description.
- [101] ITU-T Recommendation Q.764 (1999), Signalling System No. 7 – ISDN user part signalling procedures.

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