ETSI EN 300 403-1 V1.3.2 (1999-11)

European Standard (Telecommunications series)

Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification

[ITU-T Recommendation Q.931 (1993), modified]

Reference

REN/SPS-05210-1 (3qc90j1c.PDF)

Keywords

basic, DSS1, ISDN, layer 3, protocol, UNI

ETSI

Postal address

F-06921 Sophia Antipolis Cedex - FRANCE

Office address

650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16
Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Internet

secretariat@etsi.fr
Individual copies of this ETSI deliverable
can be downloaded from
http://www.etsi.org
If you find errors in the present document, send your
comment to: editor@etsi.fr

Important notice

This ETSI deliverable may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference should be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Copyright Notification

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://www.etsi.org/ipr).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 1 of a multi-part EN covering the Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control, as identified below:

> **Part 1:** **"Protocol specification [ITU-T Recommendation Q.931 (1993), modified]";**
>
> Part 2: "Specification and Description Language (SDL) diagrams";
>
> Part 3: "Protocol Implementation Conformance Statement (PICS) proforma specification";
>
> Part 4: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";
>
> Part 5: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";
>
> Part 6: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";
>
> Part 7: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

The present document which is based upon ITU-T Recommendation Q.931 (1993) is an extended and updated version of ETS 300 403-1 (1995) and ETS 300 102-1 (1990). Annex ZA identifies relevant differences between the present document and these standards.

National transposition dates	
Date of adoption of this EN:	12 November 1999
Date of latest announcement of this EN (doa):	29 February 2000
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2000
Date of withdrawal of any conflicting National Standard (dow):	31 August 2000

Endorsement notice

The elements of ITU-T Recommendation Q.931 (1993) apply, with the following modifications:

> NOTE: Underlining and/or strikeout are used to highlight detailed modifications where necessary.

Page 1, clause 1

Delete clause 1 (General) and subclause 1.1 (Scope of the Recommendation).

Insert the following three clauses (Scope, References, Definitions) at the start of the text:

Scope

The present document specifies the stage three of circuit-mode on-demand basic telecommunication services for the pan-European Integrated Services Digital Network (ISDN) as provided by European telecommunications operators at the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [95] by means of the Digital Subscriber Signalling System No. one (DSS1). Stage three identifies the protocol procedures and switching functions needed to support a telecommunication service (see CCITT Recommendation I.130 [92]).

In addition, the present document specifies the protocol requirements at the T reference point where the service is provided to the user via a private ISDN.

> NOTE 1: Procedures at the T reference point, to support the access of a private ISDN to the public ISDN are not explicitly identified in the present document, however some procedures are applicable only to the T reference point.

The present document does not specify the additional protocol requirements where the service is provided to the user via a telecommunication network that is not an ISDN.

A basic telecommunication service is a fundamental type of service. It forms the basis on which supplementary services may be added.

> NOTE 2: Specific requirements of individual circuit-mode basic telecommunication services are not covered in the present document. However, ETR 018/EG 201 018 gives guidance on the use of service specific information elements to implement individual basic telecommunication services.

Further parts of the present document specify the Specification and Description Language (SDL) diagrams, the method of testing, and detailed application specific requirements to determine conformance based on the present document.

The present document is applicable to equipment supporting circuit-mode on-demand basic telecommunication services, to be attached at either side of a T reference point or coincident S and T reference point when used as an access to the public ISDN.

References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[87]   ITU-T Recommendation H.245 (1998): "Control protocol for multimedia communication".

[88]   ITU-T Recommendation F.711 (1993): "Audiographic conference teleservice for ISDN".

[89]   ITU-T Recommendation F.720 (1992): "Videotelephony services - General".

[90]   ITU-T Recommendation H.223 (1996): "Multiplexing protocol for low bit rate multimedia communication".

[91]   ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".

[92]   CCITT Recommendation I.130 (1988): "Method for characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[93]   ITU-Recommendation I.140 (1993): "Attribute technique for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[94]   ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means used to describe them".

[95]   ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".

[96]   CCITT Recommendation Q.9 (1988): "Vocabulary of switching and signalling terms".

[97]   ITU-T Recommendation V.34 (1994): "A modem operating at data signalling rates of up to 28 800 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits".

[98]   ETS 300 007: "Integrated Services Digital Network (ISDN); Support of packet-mode terminal equipment by an ISDN".

[99]   ETS 300 011: "Integrated Services Digital Network (ISDN); Primary rate user-network interface; Layer 1 specification and test principles".

[100]   ETS 300 012: "Integrated Services Digital Network (ISDN); Basic user-network interface; Layer 1 specification and test principles".

[101]   ETS 300 058-1: "Integrated Services Digital Network (ISDN); Call Waiting (CW) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[102]   ETS 300 092-1: "Integrated Services Digital Network (ISDN); Calling Line Identification Presentation (CLIP) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[103]   ETS 300 093-1: "Integrated Services Digital Network (ISDN); Calling Line Identification Restriction (CLIR) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[104]   ETS 300 122-1: "Integrated Services Digital Network (ISDN); Generic keypad protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[105]   EN 300 196-1 (V1.2): "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[106]   ETS 300 207-1: "Integrated Services Digital Network (ISDN); Diversion supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[107]   ETS 300 286-1: "Integrated Services Digital Network (ISDN); User-to-User Signalling (UUS) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[108]   ETS 300 383: "Integrated Services Digital Network (ISDN); File transfer over the ISDN; EUROFILE transfer profile".

[109]   ETS 300 388: "Integrated Services Digital Network (ISDN); File Transfer Access & Management (FTAM) over ISDN based on simple file transfer profile".

[110]   ETS 300 402-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 1: General aspects [ITU-T Recommendation Q.920 (1993), modified]".

[111]   ETS 300 402-2: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 2: General protocol specification [ITU-T Recommendation Q.921 (1993), modified]".

[112]   ETS 300 403-2: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 2: Specification and Description Language (SDL) diagrams".

[113]   ETS 300 485: "Integrated Services Digital Network (ISDN); Definition and usage of cause and location in Digital Subscriber Signalling System No. one (DSS1) and Signalling System No. 7 ISDN User Part (ISUP) [ITU-T Recommendation Q.850 (1993), modified]".

NOTE: The references listed in the present document are a continuation of publications referenced in ITU-T Recommendation Q.931.

Definitions

For the purposes of the present document, the following definitions apply, together with those given in the referenced publications:

access channel; channel: see CCITT Recommendation Q.9 [96], definition 0008

B-channel: 64 kbit/s channel accompanied by timing intended to carry a wide variety of user information streams. A B-channel does not carry signalling information for circuit switching by the ISDN

basic access: see CCITT Recommendation Q.9 [96], definition 1551

basic service; basic telecommunication service: see CCITT Recommendation Q.9 [96], definition 7018

call: see CCITT Recommendation Q.9 [96], definition 2201

call control message: message as defined in subclause 3.1 of the present document, which on sending or receipt causes a change of the call state at either the network or the user; and also PROGRESS and INFORMATION messages

call establishment; connection establishment: see CCITT Recommendation Q.9 [96], definition 2207

call reference: identifier of a signalling transaction. The signalling transaction may either be bearer related, in which case the signalling transaction can be used to control that bearer, or bearer independent, in which case there is no bearer associated with that signalling transaction. All signalling transactions in the present document are bearer related except those associated with the global call reference. Where there is only one bearer required for a call, then the call reference of the associated bearer related signalling transaction might be used to identify the call. In the present document, there is only one bearer for each call

call state: state as defined in subclause 2.1 of the present document, for either the user side or network side as appropriate. A call state may exist for each call reference value (and at the network side for each additional responding CEI in the incoming call states)

circuit switched; circuit switching: see CCITT Recommendation Q.9 [96], definition 1125

comprehension required: requirement that the coding structure and meaning of an information element shall be understood by its receiver for the message to be processed. A specific range of values for information element identifiers is provided for those information elements for which comprehension is required

connection: see CCITT Recommendation Q.9 [96], definition 0011. In the present document, the term is taken to include a bearer and its associated control signalling

D-channel: channel primarily intended to carry signalling information for circuit switching by the ISDN

data link connection endpoint identifier: identifier used by a layer 3 protocol entity to address its peer entity

dummy call reference: call reference value of one octet length encoded as "0000 0000"

en bloc receiving: procedure, used in call establishment of an incoming call, to enable the network to send called party number digits to the user in a single message

en bloc sending: procedure, used in call establishment of an outgoing call, to enable the user to send called party number digits to the network in a single message

global call reference: Call reference information element with a call reference value of zero. The length of the call reference value is encoded in the first octet of the information element. The Global call reference identifies all call references currently associated with the appropriate data link connection endpoint identifier

Incoming (call): call incoming to the user side of the interface

Integrated Services Digital Network (ISDN): see ITU-T Recommendation I.112 [91], definition 308

interface: see CCITT Recommendation Q.9 [96], definition 4001

Network Service Access Point (NSAP) address; OSI NSAP address: see CCITT Recommendation Q.9 [96], definition 2083

network: DSS1 protocol entity at the network side of the user-network interface

on demand: see ITU-T Recommendation I.140 [93], annex A, clause A.2

Open System Interconnection (OSI): concept of interconnecting systems in accordance with the architecture described in the Open System Interconnection Reference model (CCITT Recommendation X.200 [78])

outgoing (call): call outgoing from the user side of the interface

overlap receiving: procedure, used in call establishment of an incoming call, to enable the network to send called party number digits to the user in successive messages, as and when they are made available from the remote network

overlap sending: procedure, used in call establishment of an outgoing call, to enable the user to send called party number digits to the network in successive messages, as and when they are made available by the user

point-to-multipoint configuration; multipoint terminal configuration; multipoint configuration: terminal configuration in which there is more than one signalling entity

point-to-multipoint data link; broadcast data link: data link connection with the capability of supporting more than two connection endpoints

point-to-point configuration; single-point terminal configuration; single-point configuration: terminal configuration in which there is one signalling entity

point-to-point data link: data link on which a frame is directed to a single endpoint

primary rate access: see CCITT Recommendation Q.9 [96], definition 1552

service; telecommunication service: see ITU-T Recommendation I.112 [91], definition 201

supplementary service: see ITU-T Recommendation I.210 [94], subclause 2.4

user: DSS1 protocol entity at the user side of the user-network interface

Throughout the text of ITU-T Recommendation Q.931

Replace references throughout the text as shown below.

Reference in ITU-T Recommendation Q.931	Modified reference
ITU-T Recommendation I.430 [46]	ETS 300 012 [100]
ITU-T Recommendation I.431 [27]	ETS 300 011 [99]
ITU-T Recommendation Q.850 [67]	ETS 300 485 [113]
ITU-T Recommendation Q.920 [45]	ITU-T Recommendation Q.920 as modified by ETS 300 402-1 [110]
ITU-T Recommendation Q.921 [3]	ITU-T Recommendation Q.921 as modified by ETS 300 402-2 [111]
ITU-T Recommendation Q.931	ITU-T Recommendation Q.931 as modified by the present document
ITU-T Recommendation Q.951 [85], clause 3	ETS 300 092-1 [102]
ITU-T Recommendation Q.951 [85], clause 4	ETS 300 093-1 [103]
ITU-T Recommendation Q.952 [86]	ETS 300 207-1 [106]
ITU-T Recommendation Q.953 [84], clause 1	ETS 300 058-1 [101]
ITU-T Recommendation Q.957 [54], clause 1	ETS 300 286-1 [107]

Pages 1 and 2, clause 2

Replace the second paragraph by:

In the subclauses which follow, states are defined for circuit switched calls in subclause 2.1 (call states) and for the interface in subclause 2.4 (global call reference states).

Replace the three last paragraphs by:

A detailed description of the procedures for call control is given in clause 5 in terms of:

   a) the messages defined in clause 3 which are transferred across the user-network interface;

   b) the information processing and actions that take place at the user side and the network side. Detailed SDL diagrams for call control of circuit switched calls are contained in ETS 300 403-2 [112].

Page 2, subclause 2.1, last paragraph

Delete the last paragraph referring to annex D.

Pages 4 to 6, subclause 2.2

Delete subclause 2.2 and all of its subclauses. The basic packet-mode access connection control states for access to the ISDN virtual bearer service are defined in ETS 300 007 [98] and are outside the scope of the present document.

Pages 6 to 8, subclause 2.3

Delete subclause 2.3 and all of its subclauses. Temporary signalling connections are outside the scope of the present document.

Page 8, subclause 2.4, last paragraph

Replace the last paragraph by:

The global call reference shall be handled independently for incoming and outgoing sides, i.e. two independent state machines in an entity shall be referenced by the global call reference.

Page 8, subclause 2.4.1.1, subclause heading

Replace the subclause heading by the following:

2.4.1.1   Restart Null (Rest 0)

Page 9, subclause 2.4.2.1, subclause heading

Replace the subclause heading by the following:

2.4.2.1   Restart Null (Rest 0)

Page 9, clause 3, note 1

Delete the last sentence "Annex D ... interfaces".

Page 10, table 3-1/Q.931

Include SEGMENT as a message in the *Miscellaneous messages* part of table 3-1/Q.931 with a reference to subclause 3.5.1.

Page 11, table 3-2/Q.931

Modify table 3-2/Q.931 as follows:

Message type: ALERTING Significance: global Direction: both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - 3̲
Message type	4.4	both	M	1
Bearer capability	4.5	both	O (note 1)	4 - 12
Channel identification	4.5	~~both (note 2)~~ u → n	O (note 3)	2 - 3̲4̲
Progress indicator	4.5	both	O (note 4)	2 - 4
Display	4.5	n → u	O (note 5)	2 - 82̲ (note 6)
~~Signal~~	~~4.5~~	~~n → u~~	~~O (note 7)~~	~~2 - 3~~
High layer compatibility	4.5	both	O (note 8)	2 - 5

NOTE 1: The Bearer capability information element is included when the procedures of subclause 5.11 for bearer capability selection apply. When present, progress description #5 "interworking has occurred and has resulted in a telecommunication service change" shall also be present.
NOTE 2: ~~Included in the network-to-user direction for support of the procedures in annex D.~~ Void.
NOTE 3: Mandatory if this message is the first message in response to SETUP, unless the user accepts the B-channel indicated in the SETUP message.
NOTE 4: Included in the event of interworking. Included in the network-to-user direction in connection with the provision of in-band information/patterns. Included in the user-to-network direction in connection with the provision of in-band information/patterns if annex K is implemented or in accordance with the procedures of subclause 5.11.3 and subclause 5.12.3.
NOTE 5: Included if the network provides information that can be presented to the user.
NOTE 6: The minimum length is 2 octets; the maximum length ~~is network dependent and is either 34 or~~ 82 octets.
NOTE 7: ~~Included if the network optionally provides information describing tones or alerting signals.~~ Void.
NOTE 8: The High layer compatibility information element is included when the procedures of subclause 5.12 for high layer compatibility selection apply. When present, progress description #5, "interworking has occurred and has resulted in a telecommunication service change", shall also be present.

Page 12, table 3-3/Q.931

Modify table 3-3/Q.931 as follows:

Message type:	CALL PROCEEDING			
Significance:	local			
Direction:	both			
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - 3
Message type	4.4	both	M	1
Bearer capability	4.5	both	O (note 5)	4 - 12
Channel identification	4.5	both	O (note 1)	2 - 34
Progress indicator	4.5	both	O (note 2)	2 - 4
Display	4.5	n → u	O (note 3)	2 - 82 (note 4)
High layer compatibility	4.5	both	O (note 6)	2 - 5
NOTE 1: Mandatory in the network-to-user direction if this message is the first message in response to SETUP. Mandatory in the user-to-network direction if this message is the first message in response to SETUP, unless the user accepts the B-channel indicated in the SETUP message.				
NOTE 2: Included in the event of interworking. Included in the network-to-user direction in connection with the provision of in-band information/patterns. Included in the user-to-network direction in connection with the provision of in-band information/patterns if annex K is implemented or in accordance with the procedures of subclause 5.11.3 and subclause 5.12.3.				
NOTE 3: Included if the network provides information that can be presented to the user.				
NOTE 4: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				
NOTE 5: The Bearer capability information element is included when the procedures of subclause 5.11 for bearer capability selection apply. When present, progress description #5 "interworking has occurred and has resulted in a telecommunication service change", shall also be present.				
NOTE 6: The High layer compatibility information element is included when the procedures of subclause 5.12 for high layer compatibility selection apply. When present, progress description #5, "interworking has occurred and has resulted in a telecommunication service change", shall also be present.				

Page 13, table 3-4/Q.931

Modify table 3-4/Q.931 as follows:

Message type: CONNECT Significance: global Direction: both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - 3
Message type	4.4	both	M	1
Bearer capability	4.5	both	O (note 1)	4 - 12
Channel identification	4.5	~~both (note 2)~~ u → n	O (note 3)	2 - 34
Progress indicator	4.5	both	O (note 4)	2 - 4
Display	4.5	n → u	O (note 5)	2 - 82 (note 6)
Date/time	4.6	n → u	O (note 7)	2 - 8
~~Signal~~	~~4.5~~	~~n → u~~	~~O (note 8)~~	~~2 - 3~~
Low layer compatibility	4.5	both	O (note 9)	2 - 18
High layer compatibility	4.5	both	O (note 10)	2 - 5

NOTE 1: The Bearer capability information element is included when the procedures of subclause 5.11 for bearer capability selection apply.

NOTE 2: ~~Included in the network-to-user direction for support of the procedures in annex D.~~ Void.

NOTE 3: Mandatory if this message is the first message in response to SETUP, unless the user accepts the B-channel indicated in the SETUP message.

NOTE 4: Included in the event of interworking or in connection with the provision of in-band information/patterns.

NOTE 5: Included if the network provides information that can be presented to the user.

NOTE 6: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.

NOTE 7: As a network option, may be included to provide date and time information to the calling user for all calls or for calls involving specific telecommunication services.

NOTE 8: ~~Included if the network optionally provides information describing tones.~~ Void.

NOTE 9: Included in the user-to-network direction when the answering user wants to return low layer compatibility information to the calling user. Included in the network-to-user direction if the user awarded the call included a Low layer compatibility information element in the CONNECT message. Optionally included for low layer compatibility negotiation, but some networks may not transport this information element to the calling user (see annex J).

NOTE 10: The High layer compatibility information element is included when the procedures of subclause 5.12 for high layer compatibility selection apply.

Page 14, table 3-5/Q.931

Modify table 3-5/Q.931 as follows:

Message type: CONNECT ACKNOWLEDGE Significance: local Direction: both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - 3
Message type	4.4	both	M	1
Display	4.5	n → u	O (note 1)	2 - 82 (note 2)
~~Signal~~	~~4.5~~	~~n → u~~	~~O (note 3)~~	~~2 - 3~~

NOTE 1: Included if the network provides information that can be presented to the user.

NOTE 2: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.

NOTE 3: ~~Included if the network optionally provides additional information describing tones.~~ Void.

Page 15, table 3-6/Q.931

Modify table 3-6/Q.931 as follows:

Message type: DISCONNECT Significance: global Direction: both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - <u>3</u>
Message type	4.4	both	M	1
Cause	4.5	both	M	4 - 32
Progress indicator	4.5	(note 1) <u>n → u</u>	O (note 2)	2 - 4
Display	4.5	n → u	O (note 3)	<u>2 - 82</u> (note 4)
~~Signal~~	~~4.5~~	~~n → u~~	~~O (note 5)~~	~~2 - 3~~
NOTE 1: Included in the network-to-user direction if the network provides in-band tones. ~~See annex D for usage in the user-to-network direction.~~				
NOTE 2: Included by the network if in-band tones are provided. ~~However, the user may include the Progress Indicator and provide in-band tones (see annex D). In such cases the network will ignore this information element and will not convey the in-band tones.~~				
NOTE 3: Included if the network provides information that can be presented to the user.				
NOTE 4: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				
NOTE 5: ~~Included if the network optionally provides additional information describing tones.~~ <u>Void.</u>				

Page 16, table 3-7/Q.931

Modify table 3-7/Q.931 as follows:

Message type: INFORMATION
Significance: local (note 1)
Direction: both

Information element	Reference	Direction	Type	Length
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - ~~3~~ ~~(note 2)~~
Message type	4.4	both	M	1
Sending complete	4.5	both	O (note 3)	1
Cause	4.5	n → u	O (note 9)	2 - 32
Display	4.5	n → u	O (note 4)	2 - 82 (note 5)
Keypad facility	4.5	u → n (note 10)	O (note 6)	2 - 34
~~Signal~~	~~4.5~~	~~n → u~~	~~O (note 7)~~	~~2 - 3~~
Called party number	4.5	~~u → n~~ both	O (note 8)	2 - 23

NOTE 1: This message has local significance, but may carry information of global significance.
NOTE 2: ~~This message may be set with the dummy call reference defined in § 4.3 when feature key management procedures are used (see Recommendation Q.932); otherwise the minimum length in 2 octets.~~ Void.
NOTE 3: Included if the user optionally indicates completion of overlap sending to the network, or if the network optionally indicates completion of overlap receiving to the user.
NOTE 4: Included if the network provides information that can be presented to the user.
NOTE 5: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.
NOTE 6: ~~Either the Called party number or the Keypad facility information element is included by the user to convey called party number information to the network during overlap sending.~~ The Keypad facility information element may ~~also~~ be included i~~f the user wants to convey other call establishment information to the network or~~ to convey supplementary service information ~~(see clause 7)~~.
NOTE 7: ~~Included if the network optionally provides additional information describing tones.~~ Void.
NOTE 8: ~~Either~~ The Called party number ~~or the Keypad facility~~ information element is included by the user to convey called party number information to the network during overlap sending. The Called party number information element is included by the network to transfer called party number information to the user during overlap receiving.
NOTE 9: As a network option, may be used for stimulus operation of supplementary services.
NOTE 10: The use of the Keypad facility information element in the network to user direction is to convey supplementary service information as part of keypad protocol is a network option. (This option is maintained due to backwards compatibility and is not recommended for future use.)

Page 17, table 3-8/Q.931

Modify table 3-8/Q.931 as follows:

Message type: NOTIFY
Significance: access
Direction: both

Information element	Reference	Direction	Type	Length
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - 3
Message type	4.4	both	M	1
~~Bearer capability~~	~~4.5~~	~~n → u~~	~~O (note 1)~~	~~2 - 12~~
Notification indicator	4.5	both	M	3
Display	4.5	n → u	O (note 2)	2 - 82 (note 3)

NOTE 1: ~~Included by the network to indicate a change in bearer capability (see annex L).~~ Void.
NOTE 2: Included if the network provides information that can be presented to the user.
NOTE 3: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.

Page 18, table 3-9/Q.931

Modify table 3-9/Q.931 as follows:

Message type:	PROGRESS			
Significance:	global			
Direction:	both			
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - 3
Message type	4.4	both	M	1
Bearer capability	4.5	both	O (note 1)	2 - 12
Cause	4.5	both	O (note 2)	2 - 32
Progress indicator	4.5	both	M	4
Display	4.5	n → u	O (note 3)	2 - 82 (note 4)
High layer compatibility	4.5	both	O (note 5)	2 - 5

NOTE 1: The Bearer capability information element is included when the procedures of subclause 5.11 for bearer capability selection apply. The Bearer capability information element indicates the bearer service now being used for the call.
NOTE 2: Included by the user or the network to provide additional information concerning the provision of in-band information/patterns.
NOTE 3: Included if the network provides information that can be presented to the user.
NOTE 4: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.
NOTE 5: The High layer compatibility information element is included when the optional procedures of subclause 5.12 for high layer compatibility selection apply. The High layer compatibility information element indicates the high layer compatibility now being used for the call.

Page 19, table 3-10/Q.931

Modify table 3-10/Q.931 as follows:

Message type:	RELEASE			
Significance:	local (note 1)			
Direction:	both			
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - 3
Message type	4.4	both	M	1
Cause	4.5	both	O (note 2)	2 - 32
Display	4.5	n → u	O (note 3)	2 - 82 (note 4)
~~Signal~~	~~4.5~~	~~n → u~~	~~O (note 5)~~	~~2 - 3~~

NOTE 1: This message has a local significance; however, it may carry information of global significance when used as the first call clearing message.
NOTE 2: Mandatory in the first call clearing message, including when the RELEASE message is sent as a result of an error handling condition.
NOTE 3: Included if the network provides information that can be presented to the user.
NOTE 4: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.
NOTE 5: ~~Included if the network optionally provides additional information describing tones.~~ Void.

Page 20, table 3-11/Q.931

Modify table 3-11/Q.931 as follows:

Message type:	RELEASE COMPLETE			
Significance:	local (note 1)			
Direction:	both			
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - 3
Message type	4.4	both	M	1
Cause	4.5	both	O (note 2)	2 - 32
Display	4.5	n → u	O (note 3)	2 - 82 (note 4)
~~Signal~~	~~4.5~~	~~n → u~~	~~O (note 5)~~	~~2 - 3~~
NOTE 1: This message has a local significance; however, it may carry information of global significance when used as the first call clearing message.				
NOTE 2: Mandatory in the first call clearing message, including when the RELEASE COMPLETE message is sent as a result of an error handling condition.				
NOTE 3: Included if the network provides information that can be presented to the user.				
NOTE 4: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				
NOTE 5: ~~Included if the network optionally provides additional information describing tones.~~ Void.				

Page 20, table 3-12/Q.931

Modify table 3-12/Q.931 as follows:

Message type:	RESUME			
Significance:	local			
Direction:	user to network			
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	u → n	M	1
Call reference	4.3	u → n	M	2 - 3
Message type	4.4	u → n	M	1
Call identity	4.5	u → n	O (note ~~2~~)	2 - 10
NOTE: Included when the SUSPEND message used to suspend the call included a Call identity information element.				

Page 21, table 3-13/Q.931

Modify table 3-13/Q.931 as follows:

Message type:	RESUME ACKNOWLEDGE			
Significance:	local			
Direction:	network to user			
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	n → u	M	1
Call reference	4.3	n → u	M	2 - 3
Message type	4.4	n → u	M	1
Channel identification	4.5	n → u	M	3 - 34
Display	4.5	n → u	O (note 1)	2 - 82 (note 2)
NOTE 1: Included if the network provides information that can be presented to the user.				
NOTE 2: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				

Page 21, table 3-14/Q.931

Modify table 3-14/Q.931 as follows:

Message type: RESUME REJECT Significance: local Direction: network to user				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	n → u	M	1
Call reference	4.3	n → u	M	2 - 3
Message type	4.4	n → u	M	1
Cause	4.5	n → u	M	4 - 32
Display	4.5	n → u	O (note 1)	2 - 82 (note 2)
NOTE 1: Included if the network provides information that can be presented to the user. NOTE 2: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				

Pages 22 and 23, table 3-15/Q.931

Modify table 3-15/Q.931 as follows:

Message type:　SETUP Significance:　global Direction:　　both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - <u>3</u>
Message type	4.4	both	M	1
Sending complete	4.5	both	O (note 1)	1
~~Repeat indicator~~	~~4.5~~	~~both~~	~~O (note 2)~~	~~1~~
Bearer capability	4.5	both	M (note 3)	4 - 12
Channel identification	4.5	both	O (note 4)	2 - <u>34</u>
Progress indicator	4.5	both	O (note 5)	2 - 4
Network specific facilities	4.5	both	O (note 6)	2 - *
Display	4.5	n → u	O (note 7)	<u>2 - 82</u> (note 8)
Keypad facility	4.5	u → n <u>(note 20)</u>	O (note 9)	2 - 34
~~Signal~~	~~4.5~~	~~n → u~~	~~O (note 10)~~	~~2 - 3~~
Calling party number	4.5	both	O (note 11)	2 - <u>24</u>
Calling party subaddress	4.5	both	O (note 12)	2 - 23
Called party number	4.5	both	O (note 13)	2 - <u>23</u>
Called party subaddress	4.5	both	O (note 14)	2 - 23
Transit network selection	4.5	u → n	O (note 15)	2 - *
~~Repeat indicator~~	~~4.5~~	~~both~~	~~O (note 16)~~	~~1~~
Low layer compatibility	4.5	both	O (note 17)	2 - 18
High layer compatibility	4.5	both	O (note 18)	2 - 5
<u>Date/Time</u>	<u>4.5</u>	<u>n->u</u>	<u>O (note 19)</u>	<u>2 - 8</u>

NOTE 1:　Included if the user or the network optionally indicates that all information necessary for call establishment is included in the SETUP message.

NOTE 2:　~~The Repeat indicator information element is included immediately before the first Bearer capability information element when the bearer capability negotiation procedure is used (see annex L).~~ <u>Void.</u>

NOTE 3:　~~May be repeated if the bearer capability negotiation procedure is used (see annex L). For bearer capability negotiation, two Bearer capability information elements may be included in descending order of priority, i.e. highest priority first.~~ Although support of multiple Bearer capability information elements may not be supported on all networks, on networks that do support it, and through suitable subscription arrangements, two Bearer capability information elements may be included (see subclause 5.11). When they are not preceded by a Repeat indicator information element they are included in ascending order of priority.

NOTE 4:　Mandatory in the network-to-user direction. Included in the user-to-network direction when the user wants to indicate a channel. If not included, its absence is interpreted as "any channel acceptable".

NOTE 5:　Included in the event of interworking or in connection with the provision of in-band information/patterns.

NOTE 6:　Included by the calling user or the network to indicate network specific facilities information (see annex E).

NOTE 7:　Included if the network provides information that can be presented to the user.

NOTE 8:　The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.

NOTE 9:　~~Either the Called party number or the Keypad facility information element is included by the user to convey called party number information to the network.~~ The Keypad facility information element may ~~also~~ be included by the user to convey ~~other call establishment information to the network~~ <u>supplementary service information</u>.

NOTE 10:　~~Included if the network optionally provides additional information describing tones.~~ <u>Void.</u>

NOTE 11:　May be included by the calling user or the network to identify the calling user. Not included for basic call control, but may be included for some supplementary services.

NOTE 12:　Included in the user-to-network direction when the calling user wants to indicate the calling party subaddress. Not included in the network-to-user direction for basic call control, but may be included for some supplementary services.

NOTE 13: ~~Either~~ The Called party number ~~or the Keypad facility~~ information element is included by the user to convey called party number information to the network. The Called party number information element is included by the network when called party number information is conveyed to the user.

NOTE 14: Included in the user-to-network direction when the calling user wants to indicate the Called party subaddress. Included in the network-to-user direction if the calling user included a Called party subaddress information element in the SETUP message.

NOTE 15: Included by the calling user to select a particular transit network (see annex C).

NOTE 16: ~~Included when two or more Low layer compatibility information elements are included for low layer compatibility negotiation.~~ Void.

NOTE 17: Included in the user-to-network direction when the calling user wants to pass low layer compatibility information to the called user. Included in the network-to-user direction if the calling user included a Low layer compatibility information element in the SETUP message. ~~Two, three or four information elements may be included in descending order of priority, i.e. highest priority first, if the low layer compatibility negotiation procedures are used (see annex J).~~

NOTE 18: Included in the user-to-network direction when the calling user wants to pass high layer compatibility information to the called user. Included in the network-to-user direction if the calling user included a High layer compatibility information element in the SETUP message. Although support of multiple High layer compatibility information elements may not be supported on all networks, on networks that do support it, and through suitable subscription arrangements, two High layer compatibility information elements may be included (see subclause 5.12). When they are not preceded by a Repeat indicator information element, they are included in ascending order of priority.

NOTE 19: As a network option, may be included to provide date and time information to the called user for all calls or for calls involving specific telecommunication services.

NOTE 20: The use of the Keypad facility information element in the network to user direction is to convey supplementary service information as part of keypad protocol is a network option. (This option is maintained due to backwards compatibility and is not recommended for future use.)

Page 24, table 3-16/Q.931

Modify table 3-16/Q.931 as follows:

Message type: SETUP ACKNOWLEDGE
Significance: local
Direction: both

Information element	Reference	Direction	Type	Length
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - <u>3</u>
Message type	4.4	both	M	1
Channel identification	4.5	both	O (note 1)	2 - <u>34</u>
Progress indicator	4.5	both	O (note 2)	2 - 4
Display	4.5	n → u	O (note 3)	<u>2 - 82</u> (note 4)
~~Signal~~	~~4.5~~	~~n → u~~	~~O (note 5)~~	~~2 - 3~~

NOTE 1: Mandatory in all cases, except when the user accepts the specific B-channel indicated in the SETUP message.

NOTE 2: Included in the event of interworking or in connection with the provision of in-band information/patterns.

NOTE 3: Included if the network provides information that can be presented to the user.

NOTE 4: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.

NOTE 5: ~~Included if the network optionally providers information describing tones (e.g. activate dial tone).~~ Void.

Page 25, table 3-17/Q.931

Modify table 3-17/Q.931 as follows:

Message type: STATUS Significance: local Direction: both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - <u>3</u>
Message type	4.4	both	M	1
Cause	4.5	both	M	4 - 32
Call state	4.5	both	M	3
Display	4.5	n → u	O (note 1)	<u>2 - 82</u> (note 2)
NOTE 1: Included if the network provides information that can be presented to the user. NOTE 2: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				

Page 26, table 3-18/Q.931

Modify table 3-18/Q.931 as follows:

Message type: STATUS ENQUIRY Significance: local Direction: both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - <u>3</u>
Message type	4.4	both	M	1
Display	4.5	n → u	O (note 1)	<u>2 - 82</u> (note 2)
NOTE 1: Included if the network provides information that can be presented to the user. NOTE 2: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				

Page 26, table 3-19/Q.931

Modify table 3-19/Q.931 as follows:

Message type: SUSPEND Significance: local Direction: user to network				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	u → n	M	1
Call reference	4.3	u → n	M	2 - <u>3</u>
Message type	4.4	u → n	M	1
Call identity	4.5	u → n	O (note)	2 - 10
NOTE: Included if the user later wants to identify the suspended call explicitly.				

Page 27, table 3-20/Q.931

Modify table 3-20/Q.931 as follows:

Message type: SUSPEND ACKNOWLEDGE Significance: local Direction: network to user				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	n → u	M	1
Call reference	4.3	n → u	M	2 - 3
Message type	4.4	n → u	M	1
Display	4.5	n → u	O (note 1)	2 - 82 (note 2)
NOTE 1: Included if the network provides information that can be presented to the user. NOTE 2: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				

Page 27, table 3-21/Q.931

Modify table 3-21/Q.931 as follows:

Message type: SUSPEND REJECT Significance: local Direction: network to user				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	n → u	M	1
Call reference	4.3	n → u	M	2 - 3
Message type	4.4	n → u	M	1
Cause	4.5	n → u	M	4 - 32
Display	4.5	n → u	O (note 1)	2 - 82 (note 2)
NOTE 1: Included if the network provides information that can be presented to the user. NOTE 2: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				

Pages 28 to 36, subclause 3.2

Delete subclause 3.2 and all of its subclauses. The messages for packet-mode access connection control are defined in ETS 300 007 [98] and are outside the scope of the present document.

Pages 37 to 49, subclause 3.3

Delete subclause 3.3 and all of its subclauses. It is outside the scope of the present document.

Page 50, table 3-48/Q.931

Include SEGMENT as a message with a reference to subclause 3.5.1.

Page 50, table 3-49/Q.931

Modify table 3-49/Q.931 as follows:

Message type: RESTART Significance: local Direction: both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M (note 1)	2 - 3
Message type	4.4	both	M	1
Channel identification	4.5	both	O (note 2)	2 - 34
Display	4.5	n → u	O (note 3)	2 - 82 (note 4)
Restart indicator	4.5	both	M	3
NOTE 1: This message is sent with the global call reference defined in subclause 4.3. NOTE 2: Included when necessary to indicate the particular channel(s) to be restarted. NOTE 3: Included if the network provides the information that can be presented to the user. NOTE 4: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				

Page 51, table 3-50/Q.931

Modify table 3-50/Q.931 as follows:

Message type: RESTART ACKNOWLEDGE Significance: local Direction: both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M (note 1)	2 - 3
Message type	4.4	both	M	1
Channel identification	4.5	both	O (note 2)	2 - 34
Display	4.5	n → u	O (note 3)	2 - 82 (note 4)
Restart indicator	4.5	both	M	3
NOTE 1: This message is sent with the global call reference defined in subclause 4.3. NOTE 2: Included when necessary to indicate the particular channel(s) which have been restarted. ~~May be repeated in the case of non-associated signalling that controls two or more interfaces.~~ NOTE 3: Included if the network provides the information that can be presented to the user. NOTE 4: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				

Page 52, table 3-51/Q.931

Modify table 3-51/Q.931 as follows:

Message type: STATUS Significance: local Direction: both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M (note 1)	2 - 3
Message type	4.4	both	M	1
Cause	4.5	both	M	4 - 32
Call state	4.5	both	M	3
Display	4.5	n → u	O (note 2)	2 - 82 (note 3)
NOTE 1: This message is sent with the global call reference defined in subclause 4.3. NOTE 2: Included if the network provides information that can be presented to the user. NOTE 3: The minimum length is 2 octets; the maximum length is ~~network dependent and is either 34 or~~ 82 octets.				

Page 52

Insert the following new subclause before clause 4:

3.5   Messages used for the segmentation procedure

3.5.1   Segment

This message is sent by the user or the network when the optional segmentation procedure described in annex H is used. See table 3-52.

Table 3-52: SEGMENT message content

Message type: SEGMENT Significance: local Direction: both				
Information element	**Reference**	**Direction**	**Type**	**Length**
Protocol discriminator	4.2	both	M	1
Call reference	4.3	both	M	2 - 3
Message type	4.4	both	M	1
Segmented message	4.5	both	M	4
"Segment" (note 1)	annex H	both	M	(note 2)
NOTE 1: The segment may consist of a part of an information element, an information element or several information elements (see annex H). NOTE 2: The maximum length of the segment is N201 minus the length of the mandatory part of the SEGMENT message (8 or 9 octets). N201 is defined in ETS 300 402-2 [111].				

Page 52, clause 4

Insert the following note at the end of clause 4:

   NOTE: Throughout this clause, codepoints used for basic call procedures are defined. In some cases (e.g. in ETSs for supplementary services and ETSs for packet mode) other codepoints may be used which in the present document are marked as "All other values are reserved".

Page 53, subclause 4.2

Delete the note after the first paragraph.

Insert the following note after the second paragraph:

   NOTE: See ETR 189/EG 201 189 for guidance and reference to values used by other protocols.

Page 54, table 4-1/Q931

Modify table 4-1/Q.931 as follows:

Bits 8 7 6 5 4 3 2 1	
0 0 0 0 0 0 0 0 through 0 0 0 0 0 1 1 1	Assigned for user-to-user signalling (see ETS 300 286-1 [107]) - not available for use in the message protocol discriminator
0 0 0 0 1 0 0 0	Q.931 user-network call control messages
0 0 0 1 0 0 0 0 through 0 0 1 1 1 1 1 1	Reserved for other network layer or layer 3 protocols, including Recommendation X.25 [5] (note 1)
0 1 0 0 0 0 0 0 through 0 1 0 0 0 1 1 1	National use
0 1 0 0 1 0 0 0 through 0 1 0 0 1 1 1 1	reserved for ETSI use
0 1 0 1 0 0 0 0 through 1 1 1 1 1 1 1 0	reserved for other network layer or layer 3 protocols, including Recommendation X.25 [5] (note 1)
All other values are reserved.	
NOTE 1: These values are reserved to discriminate these protocol discriminators from the first octet of a X.25 packet including general format identifier.	
NOTE 2: The list of values in this table does not show all of the values that may be in use.	

Page 54, subclause 4.3

Replace the second to fourth paragraphs "The call reference (...) one or two octets" by:

The call reference is the second part of every message. The call reference is coded as shown in figure 4-3/Q.931. The length of the call reference value is indicated in octet 1, bits 1 to 4. The maximum length of the Call reference information element is three octets. The actions taken by the receiver are based on the numerical value of the call reference and are independent of the length of the Call reference information element.

All networks and users conforming to the present document shall be able to support a call reference value with a length of one octet for a basic access, and a call reference value with a length of two octets for a primary rate access.

In networks conforming to the present document, the length of the call reference value for the basic access shall be one octet and for the primary rate access two octets.

Page 55, subclause 4.3, notes 1 and 2

Replace notes 1 and 2 by:

   NOTE 1: The Call reference information element containing a dummy call reference is one octet long and is coded "0000 0000".

The dummy call reference shall not be used in association with the basic call.

   NOTE 2: The numerical value of the global call reference is zero. The equipment receiving a message containing the global call reference should interpret the message as pertaining to all call references associated with the appropriate data link connection identifier (see figure 4-5/Q.931).

For the use of the global call reference, see the restart procedure described in subclause 5.5.

Page 55, figure 4-4/Q.931, figure title

Modify the figure title as follows:

Figure 4-4/Q.931: Dummy call reference <u>(not applicable in association with the basic call)</u>

Page 56, figure 4-5/Q.931, figure title

Modify the figure title as follows:

Figure 4-5/Q.931: ~~Examples of the~~ Encoding for global call reference

Page 57, table 4-2/Q.931

Modify table 4-2/Q.931 as follows:

```
Bits
8 7 6 5 4 3 2 1
0 0 0 0 0 0 0 0          Escape to nationally specific message type (note 1 and note 2)
0 0 0 – – – – –     Call establishment messages:
        0 0 0 0 1           ALERTING
        0 0 0 1 0           CALL PROCEEDING
        0 0 1 1 1           CONNECT
        0 1 1 1 1           CONNECT ACKNOWLEDGE
        0 0 0 1 1           PROGRESS
        0 0 1 0 1           SETUP
        0 1 1 0 1           SETUP ACKNOWLEDGE
0 0 1 – – – – –     Call information phase messages:
        0 0 1 1 0           RESUME
        0 1 1 1 0           RESUME ACKNOWLEDGE
        0 0 0 1 0           RESUME REJECT
        0 0 1 0 1           SUSPEND
        0 1 1 0 1           SUSPEND ACKNOWLEDGE
        0 0 0 0 1           SUSPEND REJECT
        0 0 0 0 0           USER INFORMATION  (struck through)
0 1 0 – – – – –     Call clearing messages:
        0 0 1 0 1           DISCONNECT
        0 1 1 0 1           RELEASE
        1 1 0 1 0           RELEASE COMPLETE
        0 0 1 1 0           RESTART
        0 1 1 1 0           RESTART ACKNOWLEDGE
0 1 1 – – – – –     Miscellaneous messages:
        0 0 0 0 0           SEGMENT (note 3)
        1 1 0 0 1           CONGESTION CONTROL  (struck through)
        1 1 0 1 1           INFORMATION
        0 1 1 1 0           NOTIFY
        1 1 1 0 1           STATUS
        1 0 1 0 1           STATUS ENQUIRY
```

NOTE 1: When used, the message type is defined in the following octet(s), according to the national specification.
NOTE 2: When allocating codes for national message types, the following principle shall be applied for the first
         octet following the escape to nationally specific type:
                 1 0 x x x x x x   National standard
                 1 1 x x x x x x   ETSI standard
NOTE 3: The SEGMENT message is required if the optional segmentation procedure defined in annex H is
         implemented.

Page 58, subclause 4.5.1

Delete the paragraph following figure 4-7/Q.931: "For the information ... summarized in Table 4-3."

Pages 59 and 60, table 4-3/Q.931

Delete table 4-3/Q.931 and its notes.

Page 61, figure 4-8/Q.931

Delete figure 4-8/Q.931.

Page 61

Insert the following text before subclause 4.5.2:

> NOTE 4: One of the single octet formats is specified for shift operations described in subclause 4.5.2. This allows for the definition of eight codesets of 133 information element identifier values in each. Codeset 0 is used for these information elements that have been specified in ITU-T Recommendation Q.931. Codeset 5 is used for information elements that are specified by ETSI. The separation into two subclauses, 4.5.1.1 and 4.5.1.2 is particular to the present document.

4.5.1.1 Codeset 0

The information elements belonging to codeset 0 are listed in table 4-3, which also gives the coding of the information identifier bits.

Table 4-3: Information element identifier coding

Bits 8 7 6 5 4 3 2 1		Reference (subclause)	Maximum length (octets) (note 1)
1 : : : – – – –	*Single octet information elements:*		
0 0 0 – – – –	Reserved		
0 0 1 – – – –	Shift (note 2)	4.5.3/4.5.4	1
0 1 0 0 0 0 1	Sending complete	4.5.27	1
0 : : : : : : :	*Variable length information elements:*		
0 0 0 0 0 0 0	Segmented message	4.5.26	4
0 0 0 0 1 0 0	Bearer capability (note 2)	4.5.5	12
0 0 0 1 0 0 0	Cause (note 2)	4.5.12	32
0 0 1 0 0 0 0	Call identity	4.5.6	10
0 0 1 0 1 0 0	Call state	4.5.7	3
0 0 1 1 0 0 0	Channel identification (note 2)	4.5.13	34
0 0 1 1 1 1 0	Progress indicator (note 2)	4.5.23	4
0 1 0 0 0 0 0	Network specific facilities (note 2)	4.5.21	(note 4)
0 1 0 0 1 1 1	Notification indicator	4.5.22	3 <u>(note 6)</u>
0 1 0 1 0 0 0	Display	4.5.16	82
0 1 0 1 0 0 1	Date/time	4.5.15	8
0 1 0 1 1 0 0	Keypad facility	4.5.18	34
1 1 0 1 1 0 0	Calling party number	4.5.10	24
1 1 0 1 1 0 1	Calling party subaddress	4.5.11	23
1 1 1 0 0 0 0	Called party number	4.5.8	23
1 1 1 0 0 0 1	Called party subaddress	4.5.9	23
1 1 1 1 0 0 0	Transit network selection (note 2)	4.5.29	(note 4)
1 1 1 1 0 0 1	Restart indicator	4.5.25	3
1 1 1 1 1 0 0	Low layer compatibility	4.5.19	18
1 1 1 1 1 0 1	High layer compatibility (note 2)	4.5.17	5
1 1 1 1 1 1 1	Escape for extension (note 3)		
All other values are reserved (note 5).			
NOTE 1: The length limits described for the variable length information elements below take into account only the present ITU-T standardized coding values. Future enhancements and expansions to the present document will not be restricted to these limits.			
NOTE 2: This information element may be repeated.			
NOTE 3: This escape mechanism is limited to codesets 5, 6 and 7 (see subclause 4.5.2). When the escape for extension is used, the information element identifier is contained in octet group 3 and the content of the information element follows in the subsequent octets as shown in figure 4-8.			
NOTE 4: The maximum length is network dependent.			
NOTE 5: The reserved values with bits 5 to 8 coded "0 0 0 0" are for future information elements for which comprehension by the receiver is required (see subclause 5.8.7.1).			
NOTE 6: <u>The length indicated is the maximum length required by capabilities specified in the present document (Suspend and Resume). See EN 300 196-1 [105] for more generic length requirements.</u>			

Bits

8	7	6	5	4	3	2	1	Octets
Escape for extension								
0	1	1	1	1	1	1	1	1
Length of information element contents								2
1 ext	Information element identifier							3
Contents of information element								4 etc.

Figure 4-8: Information element format using escape for extension

4.5.1.2   Codeset 5

The information elements listed in table 4-3 belong to codeset 0. Additionally, table 4-3bis gives the information elements belonging to codeset 5. The rules described above for information elements belonging to codeset 0 shall be applied also for information elements belonging to codeset 5, unless an exception is explicitly stated in relation to the definition of a specific information element.

The relative order of appearance for information elements belonging to different codesets is dependent on the use of the locking or non-locking shift procedures, see subclauses 4.5.3 and 4.5.4 respectively.

Table 4-3bis: Codeset 5 information element identifier coding

Bits 8 7 6 5 4 3 2 1		Reference (subclause)

1 : : : – – – –
  0 0 0 – – – –
  0 0 1 – – – –
0 : : : : : : :
  0 0 1 1 0 1 0
	Single octet information elements:
	Reserved
	Shift (note 1)
	Variable length information element:
	Reserved (note 2)
		4.5.3/4.5.4

All other values are reserved (note 3).		
NOTE 1: This information element may be repeated. NOTE 2: Reserved in order to preserve backward compatibility with earlier versions of the present document (in which this information element is defined as Charge advice). NOTE 3: The reserved values with bits 5 to 8 coded "0 0 0 0" are for future information elements for which comprehension by the receiver is required (see subclause 5.8.7.1).		

Pages 61 and 62, subclause 4.5.2

Replace the sixth and seventh paragraphs by:

Codeset 5 is reserved for information elements defined by ETSI.

Codeset 6 is reserved for information elements specific to a national network (either public or private).

Modify the tenth paragraph as follows:

Transitions from one active codeset to another (i.e. by means of the locking shift procedure) <u>shall</u> only be made to a codeset with a higher numerical value than the codeset being left.

Replace the fourteenth and fifteenth paragraphs "Codeset 6 (...) to the contrary" by:

Codeset 6 is reserved for information elements specific to a national network (either public or private). As such they do not have significance across a national or international boundary. Therefore, codeset 6 information elements shall be handled according to the procedures for unrecognized information elements (see subclause 5.8.7.1) beyond local network boundary, unless allowed by bilateral agreement.

Codeset 5 is reserved for information elements defined by ETSI. Therefore, codeset 5 information elements shall be handled according to the procedures defined for codeset 0.

The information element identifier code points with bits 5 to 8 coded "0 0 0 0" in each of the codesets are reserved for information elements for which comprehension by the receiver is required (see subclause 5.8.7.1 for specific error handling procedures).

Page 63, table 4-4/Q.931

Modify table 4-4/Q.931 as follows:

Codeset identification (bits 3 to 1):
Bits
3 2 1
0 0 0   Not applicable
0 0 1
to   Reserved
0 1 1
1 0 0   Codeset 4: information elements for ISO/IEC use
1 0 1   Codeset 5: information elements <u>defined by ETSI</u>
1 1 0   Codeset 6: information elements specific to <u>a national</u> network (either public or private)
1 1 1   Codeset 7: user-specific information elements

Page 64, table 4-5/Q.931

Modify table 4-5/Q.931 as follows:

Codeset identification (bits 3 to 1):
Bits
3 2 1
0 0 0   Codeset 0 (initially active): Q.931 information elements
0 0 1
to   Reserved
0 1 1
1 0 0   Codeset 4: information elements for ISO/IEC use
1 0 1   Codeset 5: information elements <u>defined by ETSI</u>
1 1 0   Codeset 6: information elements specific to <u>a national</u> network (either public or private)
1 1 1   Codeset 7: user-specific information elements

Page 65, figure 4-11/Q.931

Modify the Bearer capability information element as follows:

0 ext.	0	0	0	Additional Layer 3 protocol information (most significant bits)	7a*
		Spare			(Note 5)
1 ext.	0	0	0	Additional Layer 3 protocol information (most significant bits)	7b*
		Spare			(Note 5)

5   This octet may be included if octet 7 indicates ISO/IEC TR9577 (Protocol Identification in the network layer).

Pages 66 to 71, table 4-6/Q.931

Coding standard (octet 3):

Insert the following text after this entry:

Codepoint 0 0 "CCITT standardized coding as described below" shall always be used in networks conforming to the present document.

Information transfer capability (octet 3):

Insert the following text after this entry:

Codepoints 0 1 0 0 1 "restricted digital information" and 1 1 0 0 0 "video" are not applicable in networks conforming to the present document.

Information transfer rate (octet 4, bits 5 to 1):

Insert the following text after this entry:

Codepoints 1 0 0 0 1 "2 × 64 kbit/s", 1 0 0 1 1 "384 kbit/s", 1 0 1 0 1 "1 536 kbit/s" and 1 0 1 1 1 "1 920 kbit/s" are not applicable in networks conforming to the present document.

User information layer 1 protocol (octet 5):

Insert the following text after this entry:

Codepoints 0 0 0 1 0 "Recommendation G.711 [88] μ-law" is not applicable in networks conforming to the present document.

Insert the following codepoint:

0 0 1 1 0   "Recommendations H.223 [90] and H.245 [87]

Negotiation (octet 5a):

Change codepoint 1 "In-band negotiation not possible" to "In-band negotiation possible".

User rate (octet 5a):

Insert the codepoints 1 0 0 0 0 "64 kbit/s Recommendation X.1", 0 1 1 0 1 "38,4 kbit/s Recommendation V.110", 1 0 0 1 0 "57,6 kbit/s Recommendation V.14 extended" and 1 0 0 1 1 "28,8 kbit/s Recommendation V.110 ".

Modem Type (octet 5d):

Insert the codepoint 0 1 1 1 1 0 "Recommendation V.34 [97]". Change codepoint 0 1 1 1 0 1 "Recommendation V.32" to 0 1 1 1 0 <u>0</u>.

User information layer 2 protocol (octet 6):

Insert the codepoint 0 1 1 0 0 "LAN logical link control (ISO/IEC 8802-2) (Note 5)

User information layer 3 protocol (octet 7):

Insert the codepoint 0 1 0 1 1 "ISO/IEC TR 9577 [82] (Protocol identification in the network layer) (Note 3) (Note 5)

Add the following text after the Note 2 (before the TABLE 4-7/Q.931 of the Bearer capability attributes) :

> NOTE 3: 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 (Note 3) (Note 4)

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)
```

All other values are reserved.

> NOTE 4: 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 5: These codings can only be used where transfer mode is "circuit mode".

Page 72, subclause 4.5.6, last paragraph

Modify the last paragraph as follows:

The maximum length of this information element is ten octets.

Page 72, subclause 4.5.7, first paragraph

Replace the first paragraph by:

The purpose of the Call state information element is to describe the current status of a call (see subclause 2.1) or a global interface state (see subclause 2.4).

Page 75, subclause 4.5.8, last paragraph

Replace the last paragraph by:

The maximum length of this information element is 23 octets.

Page 78, table 4-10/Q.931, *Subaddress information (octets 4, etc.)*

Insert at the end of the first paragraph "The NSAP (...) Recommendation I.334 [25].":

In this case the S interface refers to an interface at the coincident S/T reference point.

Page 79, subclause 4.5.10, last paragraph

Replace the last paragraph by:

The maximum length of this information element is 24 octets.

Pages 80 and 81, table 4-11/Q.931

Type of number (octet 3):

Insert the following text after this entry:

Codepoint 1 1 0 "abbreviated number" is not applicable in networks conforming to the present document.

Screening indicator (octet 3a):

Insert the following text after this entry:

Codepoint 1 0 "user-provided, verified and failed" is not applicable in networks conforming to the present document.

Page 82, table 4-12/Q.931, *Subaddress information (octets 4, etc.)*

Insert at the end of the first paragraph "The NSAP (...) Recommendation I.334 [25].":

In this case the S interface refers to an interface at the coincident S/T reference point.

Page 83, subclause 4.5.12

Insert at the end of the subclause:

The diagnostic to cause #86 "call having the requested call identity has been cleared" shall be the complete Cause information element used in the clearing of the original call.

The format of the Cause information element is as follows:

Bits

8	7	6	5	4	3	2	1	Octets
Cause information element identifier								
0	0	0	0	1	0	0	0	1
Length of cause contents								2
0/1 ext	Coding standard		0 Spare	Location				3
1 ext	Recommendation							3a*
1 ext	Cause value							4
Diagnostic(s) (if any)								5*

Figure 4-17bis: Cause information element

Page 83, subclause 4.5.13, second and third paragraphs

Replace the second and third paragraphs by:

The Channel identification information element is coded as shown in figure 4-18 and table 4-13. The Channel identification information element may be repeated in a message.

The maximum length for this information element is 34 octets.

Pages 84 and 85, table 4-13/Q.931

Interface identifier present (octet 3):

Codepoint 1 "interface explicitly identified in one or more octets beginning with octet 3.1" is not applicable in networks conforming to the present document.

Interface type (octet 3):

Codepoint 1 "other interface" is only applicable for the primary rate interface in networks conforming to the present document.

Interface identifier (octet 3.1):

This codepoint is not applicable in networks conforming to the present document.

Number/map (octet 3.2):

Codepoint 0 "channel is indicated by the number in the following octet" is applicable when one or more circuit(s) is/are to be restarted.

Codepoint 1 "channel is indicated by the slot map in the following octet(s)" is not applicable in networks conforming to the present document except when supporting the multirate (64 kbit/s base rate) bearer capability on a primary rate access.

Channel type/map element type (octet 3.2):

Codepoints 0 1 1 0 "H0-channel units", 1 0 0 0 "H11-channel units" and 1 0 0 1 "H12-channel units" are not applicable in networks conforming to the present document.

Channel number (octet 3.3):

Replace note 1 by:

> NOTE 1: Channel number is used exclusively except when supporting the multirate (64 kbit/s base rate) bearer capability in which case the slot map is used exclusively.

Page 86, figure 4-19/Q.931, map(b) and map(c)

Delete map b) "Primary rate interface, map element type = H_0-channel" and map c) "Primary rate interface, map element type = H_1-channel".

Page 87, subclause 4.5.14

Delete subclause 4.5.14. It is outside the scope of the present document.

Page 87, subclause 4.5.15, note

Replace the note by:

> NOTE: The time indicated is local time.

Page 87, subclause 4.5.15

Insert at the end of the subclause (i.e. below the figure):

If the date is represented using the gregorian calendar, the field "year" shall contain the binary representation of the last two digits of the decimal representation of the year, i.e. the binary representation of a number in the range from 0 to 99.

> EXAMPLE: The year 1998 shall be coded as "01100010", which is the binary equivalent of the decimal number "98". The year 2001 shall be coded as "00000001", which is the binary equivalent of the decimal number "01".

Page 88, subclause 4.5.16, last paragraph

Replace the last paragraph by:

The Display information element has a maximum length of 82 octets. If a user receives a Display information element with a length exceeding the maximum length which the user can handle, the information element should be truncated by the user.

Page 88, figure 4-22/Q.931

Add the following note to figure 4-22/Q.931:

> NOTE: The IA5 character string in the "display information" field shall be coded using appropriate national IA5 tables.

Page 89, subclause 4.5.17

Insert the following note after the third paragraph:

> NOTE: The Repeat indicator information element is not included in the present document.

Page 89, figure 4-23/Q.931

Modify figure 4-23 as follows:

				Bits					
8	7	6	5	4	3	2	1		Octets
High layer compatibility information element identifier									
0	1	1	1	1	1	0	1		1
Length of high layer compatibility contents									2
1 ext	Coding standard		Interpretation			Presentation method of protocol profile			3
0/1 ext	High layer characteristics identification								4
1 ext	Extended videotelephony characteristics identification								4a* (note)

NOTE: This octet may be present when octet 4 indicates Videotelephony, Videoconferencing or Audiographic conferencing.

Pages 90, table 4-15/Q.931

Modify octet 4 for High layer characteristic identification as follows:

High layer characteristics identification (octet 4)

Bits
7 6 5 4 3 2 1
0 0 0 0 0 0 1   Telephony
0 0 0 0 1 0 0   Facsimile Group 2/3 (Recommendation F.182 [68])
0 1 0 0 0 0 1   Facsimile Group 4 Class I (Recommendation F.184 [69])
0 1 0 0 1 0 0   Teletex service, basic and mixed mode of operation (Recommendation F.230 [70]) and facsimile service Group 4, Classes II and III (Recommendation F.184)
0 1 0 1 0 0 0   Teletex service, basic and processable mode of operation (Recommendation F.220 [71])
0 1 1 0 0 0 1   Teletex service, basic mode of operation (Recommendation F.200 [72])
0 1 1 0 0 1 0   Syntax based Videotex (Recommendations F.300 [73] and T.102 [74])
0 1 1 0 0 1 1   International Videotex interworking via gateways or interworking units (Recommendations F.300 [73] and T.101 [75])
0 1 1 0 1 0 1   Telex service (Recommendation F.60 [76])
0 1 1 1 0 0 0   Message Handling Systems (MHS) (Recommendation X.400 series [77])
1 0 0 0 0 0 1   OSI application (note 2) (Recommendation X.200 series [78])
1 0 0 0 0 1 0   FTAM application (ETS 300 388 [109])
1 0 1 1 1 1 0   Reserved for maintenance (note 4)
1 0 1 1 1 1 1   Reserved for management (note 4)
1 1 0 0 0 0 0   Audio visual Videotelephony (Recommendations F.720 [89] and F.721 [79]) (note 4)
1 1 0 0 0 0 1   Videoconferencing (Recommendation F.730 [90] (note 4)
1 1 0 0 0 1 0   Audiographic conferencing (Recommendations F.710 [87] and F.711 [88]) (note 4)
1 1 0 0 0 1 1
through   Reserved for audiovisual services (Recommendation F.700 series [80])
1 1 0 0 1 1 1
1 1 0 1 0 0 0   Multimedia services (F.700 [80]) (note 4)
1 1 0 0 0 1 1
through   Reserved for audiovisual services (Recommendation F.700 series [80])
1 1 0 1 1 1 1
1 1 1 1 1 1 1   Reserved

All other values are reserved.

NOTE 1: The coding above applies in the case of "Coding standard" = "CCITT standard" and "Presentation method of protocol profile" = "High layer protocol profile".
NOTE 2: Further compatibility checking will be executed by the OSI high layer protocol.
NOTE 3: Code points are added only to those services for which CCITT Recommendations are available. See also Recommendation I.241 [34].
NOTE 4: When this coding is included, octet 4 may be followed by octet 4a.

Page 91, table 4-15/Q.931

Delete octet 4a for Extended high layer characteristics identification in table 4-15/Q.931. It is not applicable to networks conforming to the present document.

Add a new octet 4a for Extended audiovisual characteristics identification (for Videotelephony, Videoconferencing and Audiographic conferencing) in table 4-15/Q.931:

Extended audiovisual characteristics identification (octet 4a)   *for Videotelephony, Videoconferencing and Audiographic conferencing)*
Bits   <u>7 6 5 4 3 2 1</u>   0 0 0 0 0 0 1   Capability set of initial channel of H.221   0 0 0 0 0 1 0   Capability set of subsequent channel of H.221   0 1 0 0 0 0 1   Capability set of initial channel associated with an active 3,1 kHz audio or speech call   All other values are reserved.

Page 91, subclause 4.5.17

Insert at the end of subclause 4.5.17:

Coding requirements applicable if the coding standard field of the High layer compatibility information element is set to 10 "national standard":

Bits								Octets
8	7	6	5	4	3	2	1	
High layer compatibility information element identifier								
0	1	1	1	1	1	0	1	1
Length of high layer compatibility contents								2
1 ext	1	0	Interpretation			Presentation method of protocol profile		3
0/1 ext	ETSI High layer characteristics identification							4

Figure 4-23bis

Interpretation (octet 3)

The same codepoints as for ITU-T (CCITT) standardized coding shall apply.

Presentation method of protocol profile (octet 3)

The same codepoints as for ITU-T (CCITT) standardized coding shall apply.

ETSI High layer characteristics identification (octet 4)

Bits
<u>7 6 5 4 3 2 1</u>

0 X X X X X X   reserved for national standards
1 0 0 0 0 0 1   Eurofile transfer (ETS 300 383 [108])

All other values are reserved for ETSI.

Pages 94, figure 4-25/Q.931

Modify the Low layer information element adding at the end the following two octets:

0 ext.	0	0	0	Additional layer 3 protocol information (most significant bits)	7a* (Note 9)
		Spare			
1 ext.	0	0	0	Additional layer 3 protocol information (least significant bits)	7b* (Note 9)
		Spare			

9   This may be included if octet 7 indicates ISO/IEC TR9577

Page 94, figure 4-25/Q.931

Add the following note to figure 4-25/Q.931:

NOTE 10 :   Octet 3a shall be present if out-band negotiation is required.

Pages 96 to 99, table 4-16/Q.931

User information layer 1 protocol (octet 5):

Insert the following codepoint:

0 0 1 1 0   "Recommendations H.223 [90] and H.245 [87]

User rate (octet 5a):

Insert the codepoints 0 1 1 0 1 "38,4 kbit/s Recommendation V.110", 1 0 0 1 0 "57,6 kbit/s Recommendation V.14 extended" and 1 0 0 1 1 "28,8 kbit/s Recommendation V.110".

In-band/out-band negotiation (octet 5b):

Replace the description of codepoint 0 by:

0   negotiation is done with USER INFORMATION messages (see ETS 300 286-1 [107])

Modem type (octet 5d):

Insert the codepoint 0 1 1 1 1 0 "Recommendation V.34 [97]".

User information layer 2 protocol (octet 6):

Change codepoint 0 1 1 1 1 "Recommendation X.25 Multilink" to 0 0 1 1 1.

User information layer 3 protocol (octet 7):

Consider the codepoint 0 1 0 1 1 "ISO/IEC TR 9577 [82] (Protocol identification in the network layer) (Note 3)

NOTE 3- When this coding is included, octets 7a and 7b with ITU-T X.25, X.223 [90] and ISO/IEC 9577 encoding may be included.

Add at the end of TABLE 4-16/Q.931 the following description for Octets 7a and 7b for ISO/IEC TR 9577 coding:

Octets 7a and 7b for ISO/IEC TR 9577 coding*(Note 3) (Note 4)*

        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) (Annex C of ISO/IEC TR 9577 [82])
1 1 0 0   1 1 1 1 Point to Point Protocol (RFC 1548)
```

        All other values are reserved.

NOTE 4 - If the user information layer 3 protocol indicates "Network layer protocol identification", may be included to identify the actual user information layer 3 protocol to the addressed entity (see Annex I). Any Network layer Protocol Identifier code defined in ISO/IEC TR 9577 [82] may be included. Octet 7c shall not be included.

Pages 102 and 103, subclause 4.5.20

Delete subclause 4.5.20. It is outside the scope of the present document.

Page 105, figure 4-28/Q.931

Add the following note to figure 4-28/Q.931:

    NOTE: For the coding and use of this information element in relation to the provision of supplementary services see EN 300 196-1 [105].

Page 105, table 4-19/Q.931

Notification description (octet 3):

Codepoint 0 0 0 0 0 1 0 "bearer service change" is not applicable in networks conforming to the present document.

Page 106, figure 4-29/Q.931

Change the codepoint for the Progress indicator from 0 0 1 1 1 1 1 to 0 0 1 1 1 1 0.

Page 108, subclause 4.5.24

Delete subclause 4.5.24. The Repeat indicator information element is not used in networks conforming to the present document.

Page 109, table 4-22/Q.931

Replace note 1 by:

    NOTE 1: The Channel identification information element shall be included and indicates which channel(s) is (are) to be restarted or has (have) been restarted.

Delete note 2 and the reference to it.

Insert the following note and apply it to codepoints 1 1 0 "single interface" and 1 1 1 "all interfaces":

    NOTE 4: Since the present document applies only to associated signalling, the Channel identification information element shall not be included to indicate the interface to be restarted. As a consequence, either code point can be used to perform the same function.

Pages 111 and 112, subclause 4.5.28

Delete subclause 4.5.28. The Signal information element is not used in networks conforming to the present document.

Pages 114 and 115, subclause 4.5.30

Delete subclause 4.5.30. It is outside the scope of the present document.

Pages 116 to 127, subclause 4.6

Delete subclause 4.6 and all of its subclauses. It is outside the scope of the present document.

Page 128, clause 5

Replace the second to the fourth paragraphs and note 1 by:

Extensions to this basic protocol and exceptions that apply in the case of circuit-mode multirate (64 kbit/s base rate) are described elsewhere in the present document. Extensions that apply in the case of packet-mode connections and supplementary services are outside the scope of the present document and are specified in other ENs.

The call states referred to in this clause cover the states perceived by the network, states perceived by the user and states which are common to both user and network. Unless specifically qualified, all states described in the following text should be understood as common (see subclauses 2.1.1 and 2.1.2 for user and network call states, respectively).

Detailed Specification and Description Language (SDL) diagrams for the procedures specified in this clause are contained in ETS 300 403-2 [112]. The text in this clause and the SDL diagrams of ETS 300 403-2 [112] together provide a complete specification of the protocol within the scope of the present document.

> NOTE 1: This clause describes the sequence of messages associated with the control of circuit switched connections. Optional extensions to this basic protocol and exceptions that apply in the case of packet mode connections or supplementary services are described elsewhere in the present document, in ETS 300 007 [98], ETS 300 122-1 [104] and EN 300 196-1 [105].

Insert after note 2:

Keypad facility information elements shall be conveyed in either direction only in order to provide information related to the provision of supplementary services.

The option to send Keypad facility information in the network to user direction is maintained due to backwards compatibility and is not recommended for future use.

Insert after the seventh paragraph "In addition to the messages (...) may be ignored.":

The sending or receiving of a PROGRESS message will cause no state change to occur.

Page 129, subclause 5.1.1

Replace the fourth paragraph "If *en-bloc* sending ... as follows:" including bullet items a) and b), the note, and the fifth paragraph by:

If en-bloc sending is used, the SETUP message shall contain all the information required by the network to process the call. The called party address information shall be included in the Called party number information element possibly completed by the Called party subaddress information element.

If en-bloc sending is used, the SETUP message may contain the sending complete indication (i.e. the Sending complete information element).

It is mandatory for the network to recognize the Sending complete information element.

NOTE: Network operators should be aware that older TEs and NT2s may use the "#" character as a sending complete indicator.

Pages 129 and 130, subclause 5.1.2

Insert after the fifth paragraph "The user need not (...) (if it has not already done so)"):

When the user receives the ALERTING message, the user shall (independently of the presence of Progress description #1 or #8):

1) attach to the B-channel (if it has not already done so), provided the requested bearer capability is "3,1 kHz audio", "unrestricted digital information with tones/announcements", or "speech", and provided the equipment does not generate local tone; or

2) cause initiation of the user equipment generated alerting condition beginning an internally-generated alerting indication.

Page 130, subclause 5.1.3

Insert after the second paragraph "On receipt (...) SETUP ACKNOWLEDGE message":

The tone option should be interpreted as the need to return dial tone in the case where the Bearer capability information element indicates "3,1 kHz audio", "unrestricted digital information with tones/announcements", or "speech". When the tone option is applied and provided the equipment does not generate local tones, the user equipment shall attach to the B-channel on receipt of the SETUP ACKNOWLEDGE message.

Replace the fifth paragraph "The called party number information ... " and the rest of the subclause by:

The called party number information shall be provided by the user in the Called party number information element.

On receiving the first INFORMATION message, the network shall remove dial tone if it had been applied as described above. Removal of dial tone shall not be accompanied by any Progress indicator information element.

NOTE 2: Besides the possible Called party number information element, the INFORMATION messages may contain additional call information (i.e. for supplementary services). The user shall transfer all the additional call information (contained within the Keypad facility information element) before the network determines that the called party number (contained within the Called party number information element) is complete, and terminates the overlap sending procedure using the CALL PROCEEDING message as specified in subclause 5.1.5.2.

If, for symmetry purposes, the user employs timer T304, the user shall restart timer T304 when each INFORMATION message is sent.

The call information in the message that completes the information sending may contain a "sending complete" indication (i.e. the Sending complete information element). The network shall restart timer T302 on the receipt of every INFORMATION message not containing a sending complete indication.

It is mandatory for the network to recognize the Sending complete information element.

NOTE 3: Network operators should be aware that older TEs and NT2s may use the "#" character as a sending complete indication.

Page 131, subclause 5.1.5.1, note 1

Replace note 1 by:

NOTE 1: If the overlap sending procedure is used in connection with the control of a supplementary service and a supplementary service is not authorized or is not available, the procedure to be used is defined in the supplementary service control procedures.

Page 131, subclause 5.1.5.2

Modify the first sentence following item b) as follows:

> and if the network can determine that access to the requested service ~~and supplementary service~~ is authorized and available, the network shall: send a CALL PROCEEDING message to the user; stop timer T302; and enter the Outgoing Call Proceeding state.

Insert after note 1:

If the network receives INFORMATION messages from the calling user containing Called party number information element, after a CALL PROCEEDING, ALERTING, or CONNECT message has been sent, the Called party number information element shall be discarded without notifying the calling user and normal call handling shall continue.

Replace note 2 by:

> NOTE 2: If the overlap sending procedure is used in connection with the control of a supplementary service and a supplementary service is not authorized or is not available, the procedure to be used is defined in the supplementary service control procedures.

Page 132, subclause 5.1.6, third paragraph

Replace the third paragraph "If the Progress indicator (...) in-band information" by:

If the Progress indicator information element is included in any message other than the PROGRESS message, the procedures as described in the rest of subclause 5.1 apply. If the Progress indicator information element is included in the PROGRESS message, no state change will occur but if the progress description is #1 or #2 the network shall stop any supervisory timers except network timers T302 and T322. If the terminal does not provide local tones, in both cases if Progress description #1 is received by the user, the user shall connect to (if not connected already) and then monitor the B-channel for further in-band information.

Page 132, subclause 5.1.7

Replace the complete text of subclause 5.1.7 by:

Upon receiving an indication that user alerting has been initiated at the called address, the network shall send an ALERTING message across the user-network interface of the calling address and enter the Call Delivered state. When the user receives the ALERTING message the user shall enter the Call Delivered state.

In addition to the sending of the ALERTING message, networks conforming to the present document will provide in-band ringing tone to the calling user in the case where the Bearer capability information element indicates "3,1 kHz audio", "unrestricted digital information with tones/announcements", or "speech".

When the user receives the ALERTING message, the user shall:

a) attach to the B-channel if the ALERTING message includes a Progress description #1 or #8 (if the equipment does not provide local tone);

b) attach to the B-channel (if it has not already done so), provided the requested bearer capability is "3,1 kHz audio", "unrestricted digital information with tones/announcements", or "speech", and provided the equipment does not generate local tone; or

c) cause initiation of the user equipment generated alerting condition beginning an internally-generated alerting indication.

Page 132, subclause 5.1.8

Insert after the second paragraph:

Upon receiving an indication that the call has been accepted, the network shall remove any applied ringing tone.

Page 134, subclause 5.2.2

Replace subclause 5.2.2 by:

5.2.2   Compatibility and address checking

A user receiving a SETUP message shall perform compatibility and address checking before responding to that SETUP message. Any reference to a user in subclauses 5.2.3 to 5.2.7 refers to user equipment which is compatible and addressed.

5.2.2.1   Compatibility checking

Annex B defines the compatibility checking to be performed by users upon receiving a SETUP message.

When the SETUP message is delivered via a broadcast data link, an incompatible user shall either:

  a) ignore the incoming call; or

  b) respond by sending a RELEASE COMPLETE message with cause #88 "incompatible destination" and enter the Null state. The network processes this RELEASE COMPLETE message in accordance with subclause 5.2.5.3.

When the SETUP message is delivered via a point-to-point data link, an incompatible user shall respond with a RELEASE COMPLETE message with cause #88 "incompatible destination" and enter the Null state. The network shall process this RELEASE COMPLETE message in accordance with subclause 5.2.5.3.

When after receipt of a SETUP message an NT2 cannot perform compatibility checking because this is done by a terminal connected to an interface at the S reference point, if the user (i.e. the NT2) has already sent a first response message (e.g. SETUP ACKNOWLEDGE, CALL PROCEEDING) the call may be released by means of a DISCONNECT message with cause #88 "incompatible destination".

A terminal that does not support incoming calls shall respond as if it were an incompatible user.

5.2.2.2   Address checking

Annex B, subclause B.3.1, defines the address checking to be performed by users upon receiving a SETUP message.

A user that is not addressed by the Called party number information element or the Called party subaddress information element shall ignore the incoming call.

Pages 134 and 135, subclause 5.2.3.1

Replace the complete text of subclause 5.2.3.1 by:

When the SETUP message is delivered by a point-to-point data link, negotiation for the selection of a B-channel is permitted between the network and the user. Only B-channels controlled by the same D-channel are the subject of the selection procedure. The selection procedure is as follows:

  a) In the SETUP message, the network shall indicate one of the following:

    1) "channel is indicated, no acceptable alternative", i.e. channel is indicated by the information channel selection field of octet 3 (bits 2 to 1) and if applicable, octet 3.3, and the preferred/exclusive field (bit 4 of octet 3) is set to "1" in the Channel identification information element; or

    2) "channel is indicated, any alternative is acceptable", i.e. channel is indicated by the information channel selection field of octet 3 (bits 2 to 1) and if applicable, octet 3.3, and the preferred/exclusive field (bit 4 of octet 3) is set to "0" in the Channel identification information element; or

3) "any channel is acceptable", i.e. the information channel selection field of octet 3 (bits 2 to 1) of the Channel identification information element indicates "any channel"; or

4) "no B-channel available", i.e. the information channel selection field of octet 3 (bits 2 to 1) of the Channel identification information element are set to "00".

The application of the "no B-channel available" condition is outside the scope of the present document and may be covered by other documents (e.g. ETS 300 058-1 [101]).

b) In cases 1) and 2), if the indicated channel is acceptable and available, the user shall select it for the call.

In case 2), if the user cannot grant the indicated channel, it shall select any other available B-channel associated with the D-channel, and identify that channel in the Channel identification information element as "channel is indicated, no acceptable alternative" in the first message sent in response to the SETUP message.

In case 3), the user shall select any available B-channel associated with the D-channel and identify that channel in the first message sent in response to the SETUP message.

If in case 1) the B-channel indicated in the first response message is not the channel offered by the network, or if in cases 2) and 3) the B-channel indicated in the first response message is unacceptable to the network, the network shall clear the call by sending a RELEASE message with cause #6 "channel unacceptable".

In case 4), the user shall reject the call by sending a RELEASE COMPLETE message with cause #34 "no circuit/channel available" unless it is able to proceed with the call.

c) If no Channel identification information element is present in the first response message, the B-channel indicated in the SETUP message shall be assumed.

d) When a B-channel has been selected by the user, that channel may be connected by the user.

e) In case 1) if the indicated B-channel is not available, or in cases 2), 3) and 4) if no B-channel is available and the user cannot proceed with the offered call, the user shall return a RELEASE COMPLETE message with cause #44 "requested circuit/channel not available" or #34 "no circuit/channel available", respectively, and return to the Null state.

In case 1) if the specified channel does not exist, cause #82 "identified channel does not exist" shall be included in the RELEASE COMPLETE message.

See subclauses 5.2.4 and 5.2.5 for the appropriate first response to the SETUP message.

Page 135, subclause 5.2.3.2

Replace the complete text of subclause 5.2.3.2 by:

When the SETUP message is delivered by a broadcast data link, the channel selection procedure provided in subclause 5.2.3.1 is not applicable. The network shall send a SETUP message with the Channel identification information element indicating one of the following:

a) channel is indicated, no acceptable alternative (i.e. channel is indicated by the information channel selection field of octet 3 (bits 2 to 1) and if applicable, octet 3.3, and the preferred/exclusive field (bit 4 of octet 3) is set to "1" in the Channel identification information element); or

b) no B-channel available (i.e. the information channel selection field of octet 3 (bits 2 to 1) of the Channel identification information element are set to "00").

The application of the "no B-channel available" condition is outside the scope of the present document and may be covered by other documents (e.g. ETS 300 058-1 [101]).

The network shall start timers T303 and T312.

In case a), if the user can accept the call on the indicated channel, the user shall send the appropriate message (see subclauses 5.2.4 and 5.2.5). If the user cannot accept the call on the indicated channel, the user shall send a RELEASE COMPLETE message with cause #44 "requested circuit/channel not available".

The user in any case shall not connect to the channel until a CONNECT ACKNOWLEDGE message has been received.

If in case a), a B-channel is indicated in the first response message and this is not the B-channel offered by the network, the network shall clear the call by sending a RELEASE message with cause #6 "channel unacceptable". The network and user shall subsequently follow the procedures of subclause 5.3.2 item d).

In case b), the user not controlling any channel shall send a RELEASE COMPLETE message with cause #34 "no circuit/channel available".

Page 136, subclause 5.2.4

Replace the paragraph "The call address ... being used." preceding note 1 by:

The call address information may contain a "sending complete" indication (in this case the Sending complete information element shall be used).

Page 137, subclause 5.2.5.1, penultimate paragraph

Modify the first sentence of the penultimate paragraph as follows:

A busy user which satisfies the compatibility requirements indicated in the SETUP message shall ~~normally~~ respond with a RELEASE COMPLETE message with cause #17 "user busy".

Page 137, subclause 5.2.5.2, last paragraph

Modify the last sentence as follows:

Timer T301 shall not be restarted.

Page 138, subclause 5.2.5.3

Insert before the third paragraph "If the SETUP (...) to the SETUP message":

If the SETUP message has been delivered on a broadcast data link and a valid message such as a SETUP ACKNOWLEDGE, CALL PROCEEDING, ALERTING or CONNECT has been received, and if a RELEASE COMPLETE message is also received as a first answer from another user, the network shall ignore the RELEASE COMPLETE message and remain in the same state.

Page 139, subclause 5.2.6, last paragraph

Replace the last paragraph by:

If the Progress indicator information element is included in any message other than a PROGRESS message, the procedures as described in the rest of subclause 5.2 apply. If the Progress indicator information element is included in the PROGRESS message, no state change will occur but if the progress description is #1 or #2 the network shall stop any supervisory timers except network timers T301, T304, T310, T312 and T322.

> NOTE: Where non-ISDN interworking occurs, implementations may extend the value of timer T310 because the interworking may be with signalling systems that do not support an alerting indication.

Page 140, subclause 5.2.8

Insert after the third paragraph "When timer T313 (...) with 5.3.3":

In this case, cause #102 "recovery on timer expiry" shall be used.

Page 141, subclause 5.3.2

Delete item c). It is not applicable to the present document.

Replace item e) 1) by:

e) In the case of a SETUP message sent via the broadcast data link, if a network disconnect indication is received during call establishment, and prior to the expiry of timer T312, timers T301, T303, and T310 (if running) are stopped and the network enters the Call Abort state. Any user which has responded, or subsequently responds before timer T312 expires, will be cleared by a RELEASE message (with the cause code(s) contained in the network disconnect indication) and the procedures of subclause 5.3.4 shall be followed for that user. Upon expiry of timer T312, the network shall treat any subsequent responses according to the procedures defined in subclause 5.8.3.2. The network shall enter the Null state upon completion of clearing procedures for all responding users.

Insert the following item g):

g) Upon second expiry of timer T303, if implemented on the user side, the user shall send a RELEASE COMPLETE message with cause #102 "recovery on timer expiry".

Pages 141 and 142, subclause 5.3.3

Replace the complete text of subclause 5.3.3 by:

Apart from the exceptions identified in subclauses 5.3.2 and 5.8, the user shall initiate clearing by: sending a DISCONNECT message; starting timer T305 (the value of T305 is specified in subclause 9.2); disconnecting the B-channel; and entering the Disconnect Request state.

NOTE: When a user initiates call clearing by sending a RELEASE message, the procedures described in subclause 5.3.4 are then followed.

The network shall then enter the Disconnect Request state upon receipt of a DISCONNECT message. This message then prompts the network to disconnect the B-channel and to initiate procedures for clearing the network connection to the remote user. Once the B-channel used for the call has been disconnected, the network shall: send a RELEASE message to the user; start timer T308 (the value of T308 is specified in subclause 9.1); and enter the Release Request state.

On receipt of the RELEASE message the user shall: cancel timer T305; release the B-channel; send a RELEASE COMPLETE message; release the call reference; and return to the Null state.

Following the receipt of a RELEASE COMPLETE message from the user, the network shall: stop timer T308; release both the B-channel and the call reference; and return to the Null state.

Pages 142 and 143, subclause 5.3.4

Replace the complete text of subclause 5.3.4 and all of its subclauses by:

Apart from the exception conditions identified in subclauses 5.3.2 and 5.8, the network shall initiate clearing by sending a DISCONNECT message and entering the Disconnect Indication state. The DISCONNECT message is a local invitation to clear and does not imply that the B-channel has been disconnected at the user-network interface.

NOTE: When the network initiates clearing by sending a RELEASE message, the procedures described in subclause 5.3.3 are followed.

5.3.4.1   Clearing when tones/announcements provided

When in-band tones/announcements are provided (see subclause 5.4) the DISCONNECT message contains Progress indicator #8 "in-band information or appropriate pattern now available". The network shall start timer T306 and enter the Disconnect Indication state.

On receipt of the DISCONNECT message with Progress indicator #8, the user may connect (if not already connected) to the B-channel to receive the in-band tone/announcement and enter the Disconnect Indication state. Alternatively, to continue clearing without connecting to the in-band tone/announcement, the user shall: disconnect the B-channel; send a RELEASE message; start timer T308; and enter the Release Request state.

If the user connects to the provided in-band tone/announcement, the user may subsequently continue clearing (before receipt of a RELEASE message from the network) by: disconnecting the B-channel; sending a RELEASE message; starting timer T308; and entering the Release Request state.

On receipt of the RELEASE message the network shall: stop timer T306; disconnect and release the B-channel; send a RELEASE COMPLETE message; release the call reference; and return to the Null state.

Following the receipt of a RELEASE COMPLETE message from the network, the user shall: stop timer T308; release both the B-channel and the call reference; and return to the Null state.

5.3.4.2 Clearing when tones/announcements are not provided

When in-band tones/announcements are not provided the DISCONNECT message does not contain Progress indicator #8 "in-band information or appropriate pattern now available". The network shall initiate clearing by: sending the DISCONNECT message; starting timer T305; disconnecting the B-channel; and entering the Disconnect Indication state.

On receipt of the DISCONNECT message without Progress indicator #8, the user shall: disconnect the B-channel; send a RELEASE message; start timer T308; and enter the Release Request state.

On receipt of the RELEASE message the network shall: stop timer T305; release the B-channel; send a RELEASE COMPLETE message; release the call reference; and return to the Null state.

Following the receipt of a RELEASE COMPLETE message from the network, the user shall: stop timer T308; release both the B-channel and the call reference; and return to the Null state.

Page 143

Insert the following new subclause before subclause 5.3.5:

5.3.4bis Absence of response during call clearing

If a RELEASE message is not received by the entity which sent the DISCONNECT message before the expiry of timer T305 (see subclauses 5.3.3 and 5.3.4.2), that entity shall continue clearing by: sending a RELEASE message with the cause value originally contained in the DISCONNECT message; start timer T308; and enter the Release Request state. In addition to the original clearing cause, the RELEASE message may contain a second information element with cause #102 "recovery on timer expiry"; this cause may optionally contain a diagnostic field identifying the timer that expired.

When in-band tones/announcements are provided, if a RELEASE message is not received before the expiry of timer T306, the network shall continue clearing by: disconnecting the B-channel; sending a RELEASE message with the cause value originally contained in the DISCONNECT message; starting timer T308; and entering in the Release Request state. In addition to the original clearing cause, the RELEASE message may also contain a second cause information element with cause #102 "recovery on timer expiry"; this cause may optionally contain a diagnostic field identifying the timer that expired.

If a RELEASE COMPLETE message is not received by the entity which sent the RELEASE message before the first expiry of timer T308, the RELEASE message shall be retransmitted and timer T308 restarted.

If no RELEASE COMPLETE message is received from the user before timer T308 expires a second time, the network shall: place the B-channel in a maintenance condition; release the call reference; and return to the Null state.

If no RELEASE COMPLETE message is received from the network before timer T308 expires a second time, the user: shall place the B-channel in a maintenance condition or release the B-channel; shall release the call reference; and shall return to the Null state.

NOTE: For both entities, the restart procedure contained in subclause 5.5 may be used on B-channels in the maintenance condition.

For both entities, placing the B-channel in the maintenance condition is not applicable in the case of point-to-multipoint configurations, i.e. the B-channel shall be released.

Page 143, subclause 5.3.5

Replace the complete text of subclause 5.3.5 by:

Clear collision occurs when both the user and the network simultaneously transfer DISCONNECT messages specifying the same call. When the network receives a DISCONNECT message whilst in the Disconnect Indication state, the network shall: stop timer T305 or T306 (whichever is running); disconnect the B-channel (if not disconnected); send a RELEASE message; start timer T308; and enter the Release Request state. Similarly, when the user receives a DISCONNECT message whilst in the Disconnect Request state, the user shall: stop timer T305; send a RELEASE message; start timer T308; and enter the Release Request state.

Clear collision can also occur when both sides simultaneously transfer RELEASE messages related to the same call. The entity receiving such a RELEASE message whilst within the Release Request state shall: stop timer T308; release the call reference and B-channel; and enter the Null state (without sending or receiving a RELEASE COMPLETE message).

Clear collisions can also occur when one entity transfers a RELEASE message at the same time as the peer entity transfers a DISCONNECT message for the same call.

If an entity receives a DISCONNECT message while in the Release Request state, it shall remain in the Release Request state.

Page 143, subclause 5.4

Replace the second paragraph by:

When tones/announcements have to be provided in the direction network to user together with a call state change, then the appropriate message (e.g. for ALERTING, DISCONNECT, etc.; see appropriate subclause) with progress indicator #8 "in-band information or appropriate pattern is now available" is sent simultaneously with the application of the in-band tone/announcement.

Delete note 3.

Pages 143 to 145, subclause 5.5

Replace the complete text of subclause 5.5 and all of its subclauses by:

The restart procedure is used to return channels and interfaces to an idle condition. The procedure is usually invoked when the other side of the interface does not respond to other call control messages or a failure has occurred (e.g. following the expiry of timer T308 due to the absence of response to a clearing message). It may also be initiated as a result of local failure, maintenance action or misoperation.

NOTE: Layer 3 procedures and resources associated with those data links with SAPI = 0000 00 should be initialized by the restart procedures.

The call reference flag of the global call reference applies to restart procedures. In this case when both sides of the interface initiate simultaneous restart requests, they shall be handled independently (i.e. by separate state machines). In the case when the same channel(s) or interface(s) are specified, they shall not be considered free for re-use until all the relevant restart procedures are completed.

When:

a) both the user and network are aware of the configuration of the interface; and

b) the interface is a basic access (see ETS 300 012 [100]) where a point-to-point configuration exists; or

c) the interface is a primary rate access (see ETS 300 011 [99]),

then the user and network shall implement the procedures of subclause 5.5. In all other cases the procedures of subclause 5.5 are optional.

5.5.1   Sending of RESTART message

A RESTART message is sent by the network or user in order to return channels or interfaces to the idle condition. The Restart indicator information element shall be present in the RESTART message to indicate whether an "indicated channel", "single interface", or "all interfaces" are to be restarted. If the Restart indicator information element is coded as "indicated channel", then the channel identification information element shall be present to indicate which channel is to be returned to the idle condition. If the Restart indicator information element is coded as "single interface", or "all interfaces" then the Channel identification information element shall not be included.

Upon transmitting the RESTART message the sender shall enter the Restart Request state REST 1, start timer T316, and wait for a RESTART ACKNOWLEDGE message. Also, no further RESTART messages shall be sent until a RESTART ACKNOWLEDGE message is received or timer T316 expires.

NOTE 1: At the entity sending the RESTART message, initiation of appropriate internal actions to return specified channels to the idle condition and call references to the Null state is outside the scope of the present document. This should be performed so that an entity can determine when a channel or interface is available for re-use. This may require performance of these functions before or after sending the RESTART message and be monitored by a supervisory timer (that should not be greater than the value of T316 if the internal actions are performed after the sending of the RESTART message).

When a RESTART ACKNOWLEDGE message is received, the entity shall stop timer T316. When both a RESTART ACKNOWLEDGE message has been received and the channels or interface are available for re-use (excluding any that are the subject of further maintenance actions beyond the scope of the restart procedure), the entity shall enter the Restart Null state.

If a RESTART ACKNOWLEDGE message is not received prior to expiry of timer T316 one or more subsequent RESTART messages may be sent until a RESTART ACKNOWLEDGE message is returned. Meanwhile, no calls shall be placed or accepted over the channel or interface by the originator of the RESTART message. A network shall limit the number of consecutive unsuccessful restart attempts to two. When this limit is reached, the network shall make no further restart attempts. An indication will be provided to the appropriate maintenance entity. The channel or interface is considered to be in an out-of-service condition until maintenance action has been taken.

NOTE 2: If a RESTART ACKNOWLEDGE message is received indicating only a subset of the specified channels, an indication is given to the maintenance entity. It is the responsibility of the maintenance entity to determine what actions shall be taken on the channel(s) which have not been returned to the idle condition.

NOTE 3: If a RESTART ACKNOWLEDGE message is received indicating one or more channels that were not specified in the RESTART message, an indication is given to the maintenance entity to determine further actions to be taken on these channels.

The RESTART and RESTART ACKNOWLEDGE message shall contain the global call reference to which the Restart Request state is associated. These messages are transferred via the appropriate point-to-point data link in the multiple frame mode using the DL-DATA-REQUEST primitive.

5.5.2   Receipt of RESTART message

Upon receiving a RESTART message the recipient shall enter the Restart state associated with the global call reference and start timer T317.

> NOTE 1: At the entity receiving the RESTART message, initiation of appropriate internal actions to return specified channels to the idle condition and call references to the Null state is outside the scope of the present document. This should be performed so that an entity can determine when a channel or interface is available for re-use.

When the channels or interfaces are available for re-use (excluding any that are the subject of further maintenance actions beyond the scope of the restart procedure) the entity shall send a RESTART ACKNOWLEDGE message, stop timer T317 and enter the Restart Null state.

If only a subset of the specified channels have been returned to the idle condition when timer T317 expires, a RESTART ACKNOWLEDGE message shall be transmitted to the originator, containing a Channel identification information element indicating the channel(s) that have been returned to the idle condition. If none of the specified channels have been returned to the idle conditions when timer T317 expires, no actions shall be taken.

If timer T317 expires prior to completion of internal clearing an indication shall be sent to the maintenance entity (i.e. a primitive should be transmitted to the system management entity).

Even if all call references are in the Null state, and all channels are in the idle condition, the receiving entity shall transmit a RESTART ACKNOWLEDGE message to the originator upon receiving a RESTART message.

If the Restart indicator information element is coded as "all interfaces" or "single interface", then all calls on that interface shall be cleared. If the Restart indicator information element is coded as "all interfaces" or "single interface" and a Channel identification information element is included, the Channel identification information element shall be treated as described in subclause 5.8.7.3.

If the Restart indicator information element is coded as "indicated channel" and the Channel identification information element is not included, then the procedure of subclause 5.8.6.1 shall be followed.

The receiving DSS1 protocol control entity for the global call reference shall indicate a restart request to only those DSS1 protocol control entities for specific call references which:

a) are supported by the same Data Link Connection Endpoint Identifier (DLCI; see ETS 300 402-1 [110]) as the DSS1 protocol control entity for the global call reference which received the RESTART message; and

b) correspond to the specified channel(s) or interfaces, or (if the D-channel was implicitly specified) are not associated with any channel, including calls in the call establishment phase for which a channel has not yet been allocated.

The following entities shall be released:

a) B-channels established by "Q.931" messages, including channels used for packet access (case B);

> NOTE 2: The application of the restart procedure to packet-mode access is outside the scope of the present document.

b) user signalling bearer service connections;

> NOTE 3: The application of the restart procedure to the user signalling bearer service is outside the scope of the present document.

c) other resources associated with a call reference, where specified in other DSS1 standards.

> NOTE 4: The application of the restart procedure to the register procedures of EN 300 196-1 [105] is outside the scope of the present document.

The following entities shall not be released:

   a) semi-permanent connections that are established by the man-machine commands;

   b) calls associated with DSS1 protocols control entities supported by any DLCI other than one supporting the DSS1
       protocol entity for the global call reference which received the RESTART message;

   c) X.25 virtual calls and permanent virtual circuits using SAPI = 16.

   NOTE 5: The application of the restart procedure to X.25 virtual calls and permanent virtual circuits
            using SAPI = 16 is outside the scope of the present document.

   d) TID and USID values established using terminal initiation procedures.

   NOTE 6: The application of the restart procedure to the restart procedure to TID as USID values is outside the
            scope of the present document.

If semi-permanent connections established by the man-machine commands are implicitly specified (by specifying
"single interface" or "all interfaces"), no action shall be taken on those channels but a RESTART ACKNOWLEDGE
message shall be returned containing the appropriate indications (i.e. "single interface" or "all interfaces").

If semi-permanent connections established by the man-machine commands are explicitly specified (by including a
Channel identification information element in the RESTART message), no action shall be taken on those channels and a
STATUS message shall be returned with cause #82 "identified channel does not exist" optionally indicating in the
diagnostic field the channel(s) that could not be handled.

5.5.3   Restart error handling procedures

If a RESTART message is received in any other global call state than the Restart Null state, the RESTART message
shall be handled according to the procedures defined in subclause 5.8.4.

If a RESTART ACKNOWLEDGE message is received by an entity in the Restart state, the RESTART
ACKNOWLEDGE message shall be handled according to the procedures defined in subclause 5.8.4. A RESTART
ACKNOWLEDGE message received in the Restart Null state shall be ignored.

If an entity not supporting the Restart procedures receives a message using the global call reference, the handling shall
be as defined in subclause 5.8.3.2, last paragraph of item f).

Page 146, subclause 5.6.1, last paragraph

Replace the last paragraph by:

The maximum length of the call identity value within the Call identity information element is eight octets. If the network
receives a call identity value longer than the maximum length supported, the network shall: truncate the call identity
value to the maximum length; take the action specified in subclause 5.8.7.2; and continue processing.

   NOTE 2: Some networks may only support a maximum length of the call identity value of two octets.

Page 146, subclause 5.6.2, third paragraph

Modify the third paragraph as follows:

The B-channel involved in the connection will be reserved by the network until reconnection of the call (or until a
clearing cause occurs; e.g. expiry of timer T307). A NOTIFY message with notification indicator #0 "user suspended"
<u>shall be</u> sent to the other user.

Page 146, subclause 5.6.3

Insert after the first paragraph:

If the network receives a SUSPEND message from a primary rate access, the network shall reject it either by sending a SUSPEND REJECT message with cause #29 "facility rejected" or reject the message according to the procedures of subclause 5.8.4.

Page 148, subclause 5.8

Replace the complete text of subclause 5.8 by:

The requirements of this subclause are mandatory for all equipment conforming to the present document irrespective of capabilities.

All procedures transferring signalling information by using the protocol discriminator of "Q.931" user-network call control messages are applicable only to those messages which pass the checks described in subclauses 5.8.1 to 5.8.7. The error handling procedures of subclauses 5.8.1 to 5.8.7 apply to messages using a normal call reference or the global call reference, except where otherwise noted.

Detailed error handling procedures are implementation dependent and may vary from network to network. However, capabilities facilitating the orderly treatment of error conditions are provided for in this subclause and shall be provided in each implementation.

When a message is received within a DL-UNIT-DATA-INDICATION primitive that is not:

- a SETUP message received by the user; or

- a message specified to use the data link unacknowledged information transfer service in support of another implemented application, e.g. EN 300 196-1 [105],

then, as an implementation option, either:

a) the entity shall discard the received message; or

b) the entity shall process the received message as if it had been received within a DL-DATA-INDICATION primitive.

It is recommended that option a) is adopted.

Subclauses 5.8.1 to 5.8.7 are listed in order of precedence.

Page 148, subclause 5.8.3.1

Change the second paragraph to:

If the call reference information element octet 1, bits 1 through 4 indicate a length different from one octet for a basic rate access or two octets for a primary rate access, then the message shall be ignored.

Page 149, subclause 5.8.3.2, items(d) and(f)

Change item d) to:

d) When a SETUP or RESUME message is received specifying a call reference with a call reference flag incorrectly set to "1", that message shall be ignored.

Add to item f):

When a message using the global call reference is received by an entity not supporting the Restart procedures, no action shall be taken on this message and a STATUS message using the global call reference with the call state indicating Null state and cause #81 "invalid call reference" shall be returned.

Page 149, subclause 5.8.4

Replace the complete text of subclause 5.8.4 by:

Whenever an unexpected message or unrecognized message is received in any state other than the Null state, with the exception of RELEASE and RELEASE COMPLETE messages received in any state other than the Null state and DISCONNECT message received in the Release Request state, a STATUS message shall be returned with cause #98 "message not compatible with call state or message type non-existent or not implemented" and, optionally, the corresponding diagnostic. If a network or user can distinguish between unimplemented (or non-existent) message types and implemented message types which are incompatible with the call state, then a STATUS message may be sent with one of the following causes:

    a)   cause #97 "message type non-existent or not implemented"; or

    b)   cause #101 "message not compatible with call state".

Alternatively, a STATUS ENQUIRY message may be sent requesting the call state of the entity (see subclause 5.8.10). No change in state shall be made in either case at this time. This alternative is not applicable to messages using the global call reference.

However, three exceptions to this procedure exist.

The first exception is when the network or the user receives an unexpected RELEASE message (e.g. if the DISCONNECT message was corrupted by undetected transmission errors). In this case, no STATUS or STATUS ENQUIRY message is sent. Whenever the network receives an unexpected RELEASE message, the network shall: disconnect and release the B-channel; clear the network connection and the call to the remote user with the cause in the RELEASE message sent by the user or, if not included, cause #31 "normal, unspecified"; return a RELEASE COMPLETE message to the user; release the call reference; stop all timers and enter the Null state. Whenever the user receives an unexpected RELEASE message, the user shall: disconnect and release the B-channel; return a RELEASE COMPLETE message to the network; release the call reference; stop all timers and return to the Null state.

On receipt of a RELEASE message, the following exceptions to the rules above apply for the network when a SETUP message is delivered on a broadcast data link:

    a)   in state N6 "Call Present", respond with a RELEASE COMPLETE message and remain in state N6;

    b)   in states N7 "Call Received", N9 "Incoming Call Proceeding" and N25 "Overlap Receiving":

        1)   if the user who transmitted the RELEASE message has previously made a response to the SETUP message delivered on the broadcast data link (i.e. the user has a CES value), the procedures of subclause 5.2.5.3 shall apply with DISCONNECT replaced by RELEASE and the reference to subclause 5.3.3 replaced by a reference to subclause 5.3.4;

        2)   if the user has not made any previous response to the SETUP message delivered on the broadcast data link (i.e. no CES), the network shall send a RELEASE COMPLETE message and remain in the same state;

    c)   in state N8 "Connect request":

        1)   if the RELEASE message was sent by the preselected user (the user who was first to respond with a CONNECT message), the network shall respond with a RELEASE COMPLETE message and clear the call to the calling user with the cause received in the RELEASE message. The network shall continue to clear all other responding users with RELEASE messages with cause #26 "non-selected user clearing". If T312 is running, the network shall enter state N22 "Call Abort", otherwise it shall enter state N0;

        2)   if the RELEASE message was sent by a non-selected user, the network shall respond with a RELEASE COMPLETE message and remain in state N8 "Connect Request".

The second exception is when the network or the user receives an unexpected RELEASE COMPLETE message. Whenever the network receives an unexpected RELEASE COMPLETE message, the network shall: disconnect and release the B-channel; clear the network connection and the call to the remote user with the cause indicated by the user or, if not included, cause #111 "protocol error, unspecified"; release the call reference; stop all timers and enter the Null state. Whenever the user receives an unexpected RELEASE COMPLETE message, the user shall: disconnect and release the B-channel; release the call reference; stop all timers and enter the Null state.

On the network side, if the SETUP message has been delivered on a broadcast data link, and a valid message such as SETUP ACKNOWLEDGE, CALL PROCEEDING, ALERTING or CONNECT has been received, and if an unexpected RELEASE COMPLETE message is subsequently received from a user, the network shall either:

a) in states N25 "Overlap Receiving", N9 "Incoming Call Proceeding" and N7 "Call Received":

1) if it is not the first answer from that user, and if there are still other users which have already answered and are able to accept the call being offered, the network shall: save the received cause value; and remain in the same state; or

2) if it is not the first answer from that user, and there is no indication for the moment of acceptance of the call being offered by another user, but timer T312 is still running, the network shall save the received cause value and remain in the same state; or

3) if it is not the first answer from that user, and if timer T312 has expired and there are no further users able to accept the call, the network shall: stop timer T304, T310 or T301 (if running); clear the call towards the calling user; and return to the Null state.

b) in state N8 "Connect Request":

1) if the user has already answered with a CONNECT message (preselected user), the network shall: clear the call towards the calling user with the cause received in the RELEASE COMPLETE message, continue to clear all other responding users with cause #26 "non-selected user clearing"; and enter the Call Abort state if timer T312 is still running; otherwise it shall return to the Null state; or

2) if the user has already answered with another message or if it has not answered yet (non-preselected user), the network shall remain in the Connect Request state (N8).

The last exception applies if a DISCONNECT message is received while in the Release request state. In this case the procedures described in the last paragraph of subclause 5.3.5 shall apply.

Page 150, subclause 5.8.5

Insert the following note at the end of the subclause:

NOTE: The locking and non-locking shift procedures may be applied only to information element identifiers included in the diagnostics field of the Cause information element, and not to the Cause information element itself.

Page 150, subclause 5.8.6.1

Insert after the second paragraph:

Other actions taken on receipt of a RELEASE message with the Cause information element missing shall be the same as if a RELEASE message with cause #31 "normal, unspecified" had been received.

When a RELEASE message is received as the first clearing message and with a Cause information element missing, the actions taken shall be the same as if a RELEASE message with cause #31 "normal, unspecified" was received (see subclause 5.3), with the exception that the RELEASE COMPLETE message sent on the local interface shall contain cause #96 "mandatory information element missing".

Insert at the end of the subclause:

Information elements with a length indication of zero shall be treated as a missing information element.

Page 150, subclause 5.8.6.2

Insert after the second paragraph:

Other actions taken on receipt of a RELEASE message with the Cause information element with invalid content shall be the same as if a RELEASE message with cause #31 "normal, unspecified" had been received.

Insert at the end of the subclause:

If the Bearer capability information element is coded as circuit-mode, and the network cannot interpret octets 5b, 5c, 5d, 6 and 7, the network may accept these octets without declaring a protocol error and pass these octets on without change.

Page 152, subclause 5.8.7.2

The note in subclause 5.8.7.2 is a normative part of the present document.

Insert at the end of the subclause:

If the network cannot interpret the Low layer compatibility or the High layer compatibility information elements it may accept these information elements without declaring a protocol error.

Optionally, if a DISCONNECT, RELEASE or RELEASE COMPLETE message is received with non-mandatory information element content error, the procedures of subclause 5.8.7.1, third paragraph, may be followed using cause #100 "invalid information element contents".

Page 152, subclause 5.8.7.3

Replace the complete text of subclause 5.8.7.3 by:

When a message is received with a recognized information element that is not marked as "comprehension required" and is not defined to be contained in that message, the receiving entity shall treat the information element as an unrecognized information element and follow the procedure defined in subclause 5.8.7.1. When a message is received with a recognized information element that is marked as "comprehension required" and is not defined to be contained in that message, the receiving entity shall follow the procedures of subclause 5.8.6.1.

Page 152, subclause 5.8.8

Add to item a):

   In the case that a SETUP message has been sent by the network on a broadcast data link and responses have been received from other users, the call shall be retained for those users.

Add to item b):

   (i.e. call clearing shall proceed).

Page 152 and 153, subclause 5.8.9

Replace the complete text of subclause 5.8.9 by:

Whenever a "Q.931" entity is notified by its data link entity via the DL-RELEASE-INDICATION primitive that there is a data link layer malfunction, the following procedure shall apply:

   a) any calls not in the Active state shall be cleared internally.

   NOTE 1: Internal clearing refers to the "Q.931" entity. This does not preclude the local application at either the network or the user requesting a new call of the "Q.931" entity, and thus re-establishing the data link connection in order to send a new SETUP message for any otherwise lost call establishment request. A new call request in these circumstances is treated in the same manner as any other new call request.

   NOTE 2: Cause #41 "temporary failure" may be indicated.

In the case that a SETUP message has been sent by the network on a broadcast data link and responses have been received from other users, the call shall be retained for those users;

b) for any call in the Active state, timer T309 shall be started.

NOTE 3: If timer T309 is already running, see the requirements below.

The "Q.931" entity shall request layer 2 re-establishment by sending a DL-ESTABLISH-REQUEST primitive.

When informed of layer 2 re-establishment by means of the DL-ESTABLISH-CONFIRM primitive, the following procedure shall apply: the "Q.931" entity shall stop timer T309, and either:

- the "Q.931" entity shall send a STATUS message with cause #31 "normal, unspecified" to report the current state to the peer entity; or

- the "Q.931" entity shall perform the status enquiry procedure according to subclause 5.8.10 to verify the call state of the peer entity.

If timer T309 expires prior to data link re-establishment, the network shall: clear the network connection and call to the remote user with cause #27 "destination out of order"; disconnect and release the B-channel; release the call reference and enter the Null state.

If a DL-RELEASE-INDICATION primitive is received while timer T309 is running, the network shall: stop timer T309; clear the network connection and call to the remote user with the cause #27 "destination out of order"; disconnect and release the B-channel; release the call reference; and enter the Null state.

If timer T309 expires prior to data link re-establishment, the user shall: clear an attached connection (if any) with cause #27 "destination out of order"; disconnect and release the B-channel; release the call reference and enter the Null state.

If a DL-RELEASE-INDICATION primitive is received while timer T309 is running, the user shall: clear an attached connection (if any) with cause #27 "destination out of order"; disconnect and release the B-channel; release the call reference, and enter the Null state.

Page 153, subclause 5.8.10

Insert after the first paragraph:

The network shall invoke the status enquiry procedure following a layer 2 re-establishment while layer 3 is in the Active state (N10), i.e. after recovery from events reported by the DL-ESTABLISH-INDICATION or by the MDL-ERROR-INDICATION.

Insert after the second paragraph:

Wherever cause #97 "message type non-existent or not implemented" is specified in the status enquiry procedure of the present document, cause #98 "message not compatible with call state or message type non-existent or not implemented" may also be used as an alternative, and the receiver shall interpret it as if cause #97 "message type non-existent or not implemented" had been received.

Insert after the third paragraph:

Cause #30 shall be used when the status enquiry procedure is implemented.

Replace the last paragraph by:

If timer T322 expires and no STATUS message with cause #97 "message type non-existent or not implemented" (or cause #98 "message not compatible with call state or message type non-existent or not implemented") was received, the STATUS ENQUIRY message may be retransmitted one or more times until a response is received. The number of times the STATUS ENQUIRY message is retransmitted is an implementation dependent value. The call shall be cleared to the local interface with cause #41 "temporary failure" if the STATUS ENQUIRY is retransmitted the maximum number of times.

NOTE: It is suggested that the network and the user clear attached connections, if any, with cause #41 "temporary failure".

Page 154, subclause 5.8.11

Modify item c) as follows:

    c) If a STATUS message, indicating the Null state, is received in any state except the Null state, the receiver shall release all resources and move into the Null state. If appropriate, the network shall also clear the network connection, using cause #41, "temporary failure".

Insert the following items after the fourth paragraph, item iv):

    v) #98 "message not compatible with call state or message type non-existent or not implemented";

    vi) #101 "message not compatible with call state".

Delete the second sentence of the fifth paragraph "If other procedures ... STATUS message".

Modify the paragraph before the last note as follows:

When in the Restart Null state, then on receipt of a STATUS message with the global call reference no action shall be taken.

Page 154, subclause 5.9

Replace the complete text of subclause 5.9 by:

This procedure allows the network to notify a user of the suspension or resumption of the call at the remote user. It also allows a user to notify the remote user of such an event by sending a NOTIFY message containing a notify indicator to the network; upon receipt of this message, the network shall send a NOTIFY message containing the same notify indicator to the other user involved in the call. No state change occurs at any of the interface sides following the sending or the receipt of this message. It shall be possible for networks and users to receive NOTIFY messages pertaining to supplementary services in other than the Active state.

Page 154, subclause 5.10

Replace the complete text of subclause 5.10 by:

5.10 Basic telecommunication service identification and selection

5.10.1 Additional procedures at the coincident S and T reference point

5.10.1.1 Normal operation

Procedures for bearer capability selection are described in subclauses 5.11.1 and 5.11.2. Procedures for high layer compatibility selection are described in subclauses 5.12.1 and 5.12.2.

Each basic telecommunication service has the required Bearer capability information element encodings, and if applicable the required High layer compatibility information element encodings, defined for that service (e.g. see ITU-T Recommendation Q.939).

The destination user shall identify the requested teleservice by taking the presented Bearer capability and High layer compatibility information elements in all combinations. Where a permutation is not identified as a defined teleservice, that combination shall be ignored. Where a combination is identified as a defined teleservice, that combination may be considered for the purposes of service provision. If there are no valid combinations, the presented Bearer capability information elements shall be considered in order to identify a bearer service.

The destination user shall identify the requested bearer services from the values of the presented Bearer capability information elements.

    NOTE: These requirements do not preclude the user performing compatibility checking on all compatibility information according to annex B of the present document.

The originating network shall optionally perform subscription checks for all valid combinations in the order defined for the particular service. If the user has not subscribed to the prime service the network shall check for the next following basic service and so on. If the user has not subscribed to any of the basic services the call shall be released with cause #57 "bearer capability not authorized". If a fallback occurs as a result of these checks the procedures of subclauses 5.11.1 and 5.12.1 shall apply.

The destination network shall optionally perform subscription checks for all valid combinations in the order defined for the particular service. If the user has not subscribed to the prime service, the network shall check for the next following basic service and so on. The subscription check may then result in one of the following four possibilities:

a) the user has subscribed to the prime service;

   The call shall be offered to the called user without any modification following the procedures in subclauses 5.11.2 or 5.11.3 "bearer capability selection" and in subclauses 5.12.2 or 5.12.3 "high layer compatibility selection".

b) the user has not subscribed to the prime service, but to one of the valid combinations, different to the lowest basic service;

   The call shall be offered to the called user, with the highest subscribed basic service including the fallback possibility. The procedures in subclauses 5.11.2 or 5.11.3 "bearer capability selection" and in subclauses 5.12.2 or 5.12.3 "high layer compatibility selection" will then apply. No indication of the fallback will be sent towards the calling user before a bearer has been established, unless the called user indicates fallback prior to the bearer establishment.

c) the user has subscribed to the lowest basic service among the valid combinations;

   The call shall be offered to the called user containing the subscribed basic service and an indication of fallback shall be sent towards the calling user in the next message to be sent.

d) the user has not subscribed to any service;

   The call shall be cleared.

The originating and the destination network shall check the applicability of supplementary services for the highest basic service resulting from the subscription checks.

5.10.1.2   Exceptional procedures

Not applicable.

5.10.2   Procedures for interworking with private ISDNs

5.10.2.1   Normal operation

Procedures for bearer capability selection are described in subclause 5.11.3. Procedures for high layer compatibility selection are described in subclause 5.12.3.

Each basic telecommunication service has the required Bearer capability information element encodings, and if applicable the required High layer compatibility information element encodings, defined for that service (e.g. see ITU-T Recommendation Q.939).

The user (the private ISDN) shall identify the requested teleservices by taking the presented Bearer capability and High layer compatibility information elements in all combinations. Where a combination is not identified as a defined teleservice, that combination shall be ignored. Where a combination is identified as a defined teleservice, that combination may be considered for the purposes of service provision.

The user (private ISDN) shall identify the requested bearer services from the values of the requested Bearer capability information elements.

5.10.2.2   Exceptional procedures

Not applicable.

Page 155, subclause 5.11.1.1

Insert at the end of the subclause:

When a PROGRESS message is sent containing a Progress indicator information element with progress description #5 "interworking has occurred and has resulted in a telecommunications service change", neither the user nor the network shall stop timers described in subclause 5.1.6 as a result of this action.

Page 155, subclause 5.11.1.2

Insert the following items after item b):

   c) if the calling user includes a Low layer compatibility information element in a SETUP message containing a repeated Bearer capability information element, even though this is an error condition, the network shall continue normal call handling (i.e. transport the Low layer compatibility information element transparently across the network);

   d) if the calling user receives a call control message other than the CONNECT message containing a Bearer capability information element but without a Progress indicator information element with progress descriptor #5 "interworking has occurred and has resulted in a telecommunication service change", the calling user shall handle the call in the normal manner;

   e) if the calling user receives no Bearer capability information element in a call control message other than the CONNECT message but the Progress indicator information element with progress descriptor #5 "interworking has occurred and has resulted in a telecommunication service change" is included, the calling user shall assume that the bearer service or teleservice corresponds to the first Bearer capability information element that was included in the SETUP message.

Page 156, subclause 5.11.2.2

Replace the complete text of subclause 5.11.2.2 by:

The procedures of subclause 5.8 shall apply with the addition that:

   a) if low layer compatibility information is received from the originating network for a connection request for which bearer capability selection is indicated, even though this is an error condition, the network shall include the low layer compatibility information in the Low layer compatibility information element in the SETUP message sent to the destination user;

   b) if a Low layer compatibility information element is included in the received SETUP message containing a repeated Bearer capability information element, the destination user shall ignore the received Low layer compatibility information element;

   c) if the called user sends a Bearer capability information element in the CONNECT message that contains an information transfer capability which is not that requested or the nominated alternative, the destination network shall clear the call using normal clearing procedures with cause #111 "protocol error, unspecified".

Page 156, subclause 5.11.3.2.1

Insert at the end of the subclause:

When a PROGRESS message is sent containing a Progress indicator information element with progress description #5 "interworking has occurred and has resulted in a telecommunications service change", neither the user nor the network shall stop timers described in subclause 5.2.6 of this Recommendation as a result of this action.

Page 157, subclause 5.11.3.2.2

Delete the note to item a).

Insert the following items after item b):

c) if low layer compatibility information is received from the originating network for a connection request for which bearer capability selection is indicated, even though this is an error condition, the network shall include the low layer compatibility information in the Low layer compatibility information element in the SETUP message sent to the destination user;

d) if the network includes a Low layer compatibility information element in a SETUP message containing a repeated Bearer capability information element, even though this is an error condition, the user shall continue normal call handling (i.e. transport the Low layer compatibility information element transparently across the private network);

e) if the called user sends a Bearer capability information element in any call control message that contains an information transfer capability which is not that requested or the nominated alternative, the destination network shall clear the call using normal clearing procedures using cause #111 "protocol error, unspecified";

f) if the network receives a call control message other than a CONNECT message containing a Bearer capability information element but without a Progress indicator information element with progress descriptor #5 "interworking has occurred and has resulted in a telecommunication service change", the network shall act as if the Progress indicator information element with progress descriptor #5 "interworking has occurred and has resulted in a telecommunication service change" was present and handle the call in the normal manner;

g) if the network receives no Bearer capability information element in a call control message other than the CONNECT message but the Progress indicator information element with progress descriptor #5 "interworking has occurred and has resulted in a telecommunication service change" is present, the network shall assume that the bearer service or teleservice corresponds to the first Bearer capability information element that the network included in the SETUP message.

Page 157, subclause 5.12.1.1

Insert at the end of the subclause:

If fallback allowed is indicated in the SETUP message sent to denote the presence of a call request, and a high layer compatibility is received by the originating network at call completion (i.e. fallback occurs at the destination user, or fallback does not occur), the originating network shall include in the CONNECT message sent to the calling user the High layer compatibility information element of the resultant high layer compatibility.

If fallback allowed is indicated in the SETUP message as described above, and fallback occurs within ISDN, the originating network shall include in a PROGRESS message or other appropriate call control message sent to the calling user a Progress indicator information element with the progress description #5 "interworking has occurred and has resulted in a telecommunications service change". If the originating network receives a high layer compatibility from the destination network, the originating network shall include the High layer compatibility information element of the resultant high layer compatibility.

When a PROGRESS message is sent containing a Progress indicator information element with progress description #5 "interworking has occurred and has resulted in a telecommunications service change", neither the user nor the network shall stop timers described in subclause 5.1.6 of this Recommendation as a result of this action.

Page 158, subclause 5.12.2.2

Replace the complete text of subclause 5.12.2.2 by:

The procedures of subclause 5.8 of the present document shall apply with the addition that if the called user sends a High layer compatibility information element in the CONNECT message that is not as requested or the nominated alternative, the destination network shall pass this transparently towards the calling user.

Page 159, subclause 5.12.3.2.1

Add as a last paragraph:

When a PROGRESS message is sent containing a Progress indicator information element with progress description #5 "interworking has occurred and has resulted in a telecommunications service change", neither the user nor the network shall stop timers described in subclause 5.2.6 as a result of this action

Page 159

Insert the following new subclause before clause 6:

5.13   Control of status request procedures

The network shall maintain a subscribable parameter to control use of the status request procedures. The status request procedures are described in EN 300 196-1 [105] subclause 10.3.

The status request procedures are only applicable at the coincident S and T reference point.

When the value of this parameter is "status request procedures are not supported for existing services", the status request procedures shall only be used for calls that are not associated solely with any of the following list of bearer capabilities:

- speech;

- 3,1 kHz audio;

- 64 kbit/s unrestricted.

The basic telecommunication services associated with these bearer capabilities shall be known as "existing services".

Where fallback is provided according to the procedures of subclause 5.10, and the lowest priority bearer capability included in the SETUP message (i.e. that appears first) is not included in this list, this shall count as a call where status request procedures are used.

When the value of this parameter is "status request procedures are supported for existing services", the status request procedures shall be allowed, when applicable, on calls associated with all bearer capabilities.

Support of the status request procedures of EN 300 196-1 [105] subclause 10.3 is mandatory for any implementation conforming to the present document that provides a circuit-mode basic telecommunication service that is not an existing service.

Pages 159 to 173, clause 6

Delete clause 6 and all of its subclauses. The procedures for packet-mode access control are defined in ETS 300 007 [98] and therefore outside the scope of the present document.

Pages 173 to 175, clause 7

Delete clause 7 and all of its subclauses. The procedures for user-to-user signalling not associated with circuit-switched calls are outside the scope of the present document.

Page 176, subclause 8.1.1, note

Delete the note.

Pages 176 and 177, subclause 8.1.2

Replace the seventh paragraph "If the entire (...) shall not be included." by:

If the entire interface of a primary rate interface is used (i.e. 30 B-channels on a 2 048 kbit/s interface), octets 3.2 and 3.3 of the Channel identification information element shall not be included.

Replace the tenth paragraph "In case b), if the network (...) by the D-channel" by:

In case b), if the network cannot grant any preferred B-channel, it shall select any other available B-channel associated with the D-channel.

Page 177, subclause 8.1.3

Delete subclause 8.1.3. It is not applicable to the present document.

Page 178, subclause 8.2.1, note

Delete the note.

Page 178, subclause 8.2.2, seventh paragraph

Replace the seventh paragraph "If the entire (...) shall not be included." by:

If the entire interface of a primary rate interface is used (i.e. 30 B-channels on a 2 048 kbit/s interface), octets 3.2 and 3.3 of the Channel identification information element shall not be included.

Replace item 3 by:

3) When the number of channels subscribed to on a single interface is sufficient to support the call as requested, but there are insufficient free channels, cause #17 "user busy" is returned to the calling user. However, if the number of channels subscribed to on a single interface is insufficient to support the call as requested cause #65 "bearer capability not implemented" is returned to the calling user.

Page 178, subclause 8.2.2.1, second paragraph

Replace the second paragraph by:

In case 2), if the user cannot grant any preferred B-channel, it shall select any other available B-channel associated with the D-channel.

Page 179, subclause 8.2.3

Delete subclause 8.2.3. It is not applicable to the present document.

Pages 181 to 183, table 9-1/Q.931

Modify the value of timer T309 to:

6 to 12 seconds, according to the formula:
$(N200 + 1) \times T200 + 2$ seconds.

Modify the value of timer T310 to: 30 to 40 s.

The application of timers T320 and T321 is outside the scope of the present document.

Replace note 1 by:

NOTE 1: This default value assumes the use of default values at layer 2, i.e. $(N200 + 1) \times T200$. If values of N200 and T200 at layer 2 are not default values, these timers shall assume a value of $(N200 + 1) \times T200$.

Replace note 4 by:

NOTE 4: If in the Call abort state, the call reference is released if all users have completed clearing. In other states, no action is taken on expiry of timer T312 if there are still users able to proceed with the call; otherwise the responding users are cleared.

Pages 185 to 186, table 9-2/Q.931

Modify the value of timer T309 to:

6 to 12 seconds, according to the formula:
$(N200 + 1) \times T200 + 2$ seconds.
This timer shall be mandatory.

Modify the value of timer T310 to: 30 to 100 s.

Replace note 1 by:

NOTE 1: This default value assumes the use of default values at layer 2, i.e. $(N200 + 1) \times T200$. If values of N200 and T200 at layer 2 are not default values, these timers shall assume a value of $(N200 + 1) \times T200$.

Insert the following note and apply it to timers T301 and T310:

NOTE 6: These timers are not required as a part of basic call control. This does not preclude any equivalent timers (outside the scope of the present document) being implemented in the TE or NT.

Pages 187 to 259, annex A

Delete annex A. It is substituted by ETS 300 403-2 [112].

Pages 260 to 262, annex B

Annex B has the status of a normative annex.

Page 260, subclause B.3.1

Replace the first paragraph by:

If an incoming SETUP message is offered with addressing information (i.e. either subaddressing or the appropriate part of the called party number) the following actions shall occur:

Add the following text below item a):

In restricted power mode, a designated TE shall not ignore the call on account of the checking of addressing information.

Page 261, subclause B.3.3

Insert before the last paragraph:

Some terminal equipment, upon bilateral agreement with other users or in accordance with other standards (e.g. ITU-T Recommendation X.213 [23]), may employ the user-user information element for additional compatibility checking. Such terminal equipment shall check the User-user information element in a manner identical to that described here for the High layer compatibility information element "compatibility assured" case.

Insert after the last paragraph:

With regard to the presence or absence of the High layer compatibility and Low layer compatibility information elements, two cases arise:

    a) compatibility assured with the available description of the call:

        This is when all terminal equipment implement (i.e. understand the contents of) the High layer compatibility and Low layer compatibility information elements. Thus, based on the High layer compatibility and Low layer compatibility information element encoding, they are capable of accepting a call for which they have the requested functionality.

    b) compatibility not assured with the available description of the call:

        This is when all or some of the terminal equipment do not recognize (i.e. ignore) either the High layer compatibility or Low layer compatibility information elements. Without careful configuration or administration at the user's installation, there is danger that a terminal equipment which has incorrect functionality will accept the call.

Therefore, in order to assure compatibility with incoming call, it is recommended that the terminal equipment check the Low layer compatibility and High layer compatibility information elements.

Page 261

Insert the following new subclause before subclause B.3.4:

B.3.3bis User-to-user compatibility checking and bearer service selection

If the called side terminal does not support the semantics of bearer service selection, it will respond as if the fallback bearer capability were only the offered bearer capability in applying the procedures specified in subclause B.3.3.

If the called side terminal does support the semantics of bearer service selection, but it is only able to accept the call using one of the bearer capabilities (either the fallback bearer capability or the preferred bearer capability) in applying the procedures specified in subclause B.3.3.

If the called side terminal does support the semantics of bearer service selection, and if it is able to accept the call using either of the bearer capabilities (the fallback bearer capability or the preferred bearer capability), then it shall follow the procedures specified in subclause B.3.3 in separately evaluating its compatibility with the offered call for each of the offered bearer capabilities (the fallback bearer capability and the preferred bearer capability):

    a) if both evaluations show the terminal to be incompatible with the call, it shall follow the procedures specified in subclause B.3.3 for incompatible calls;

    b) if the evaluations show the terminal to be incompatible with the call for one of the two offered bearer capabilities (either the fallback bearer capability or the preferred bearer capability), it shall not answer the call using that bearer capability.

Page 263, annex C

Annex C has the status of a normative annex.

Pages 264 and 265, annex D

Delete annex D. It is not applicable.

Pages 265 and 266, annex E

Annex E has the status of a normative annex.

Pages 266 to 268, annex F

Delete annex F. It is not applicable.

Page 269, annex G

Annex G has the status of a normative annex.

Replace the first bullet item by:

- **Progress indicator No.1** - Indicates that interworking with a non-ISDN has occurred within the public networks or private networks through which the call has traversed.

Insert the following item after item c) of the third paragraph "Three interworking situations ...":

d) interworking with another network behind the T reference point.

Insert the following case after case c) of the fourth paragraph "As regards calls from A ...":

case d) - progress indicator No.1 sent to A (location sub-field = private network).

Insert the following case after case c) of the fifth paragraph "As regards calls towards A ...":

case d) - progress indicator No.1 sent to A (location sub-field = private network).

Pages 270 to 277, annex H

Annex H has the status of a normative annex.

Page 273, clause H.2

Modify item h) as follows:

g) Once the first segment has been transmitted on a particular data link connection, then all remaining segments of that message shall be sent (in order) before any other message (segmented or not) for any other call reference is sent on that data link connection, i.e. a segmented message cannot be interleaved with any other messages.

Modify item g) as follows:

h) In exceptional circumstances, the transmission of a segmented message may be aborted by sending a message or message segment containing a different call reference; sending a message with the message type not coded "segment message", or stopping the transmission of subsequent message segments pertaining to the same message.

Page 273, clause H.3

Insert after item i):

j) a re-assembly function, on receiving a SEGMENT message without the Segmented message information element, shall: stop timer T314 (if running); discard all segments of this message so far received, notify the layer 3 management entity for the data link connection that messages have been discarded; and enter the Null state;

NOTE 4: Subsequent segments relating to the same message are discarded according to rule f).

k) a re-assembly function, on receiving a SEGMENT message not including any octets of the segmented message, shall: stop timer T314 (if running); discard all segments of this message so far received, notify the layer 3 management entity for the data link connection that messages have been discarded; and enter the Null state.

NOTE 5: Subsequent segments relating to the same message are discarded according to rule f).

l) A receiving entity, on receiving a message with a different call reference while in the Receiving Segmented Message state, shall discard all segments of the segmented message so far received, and enter the Null state. The receiving entity shall process the message received with the new call reference.

NOTE 6: Subsequent segments relating to the same message are discarded according to rule f).

Pages 275 to 277, figure H.5/Q.931 (3 sheets)
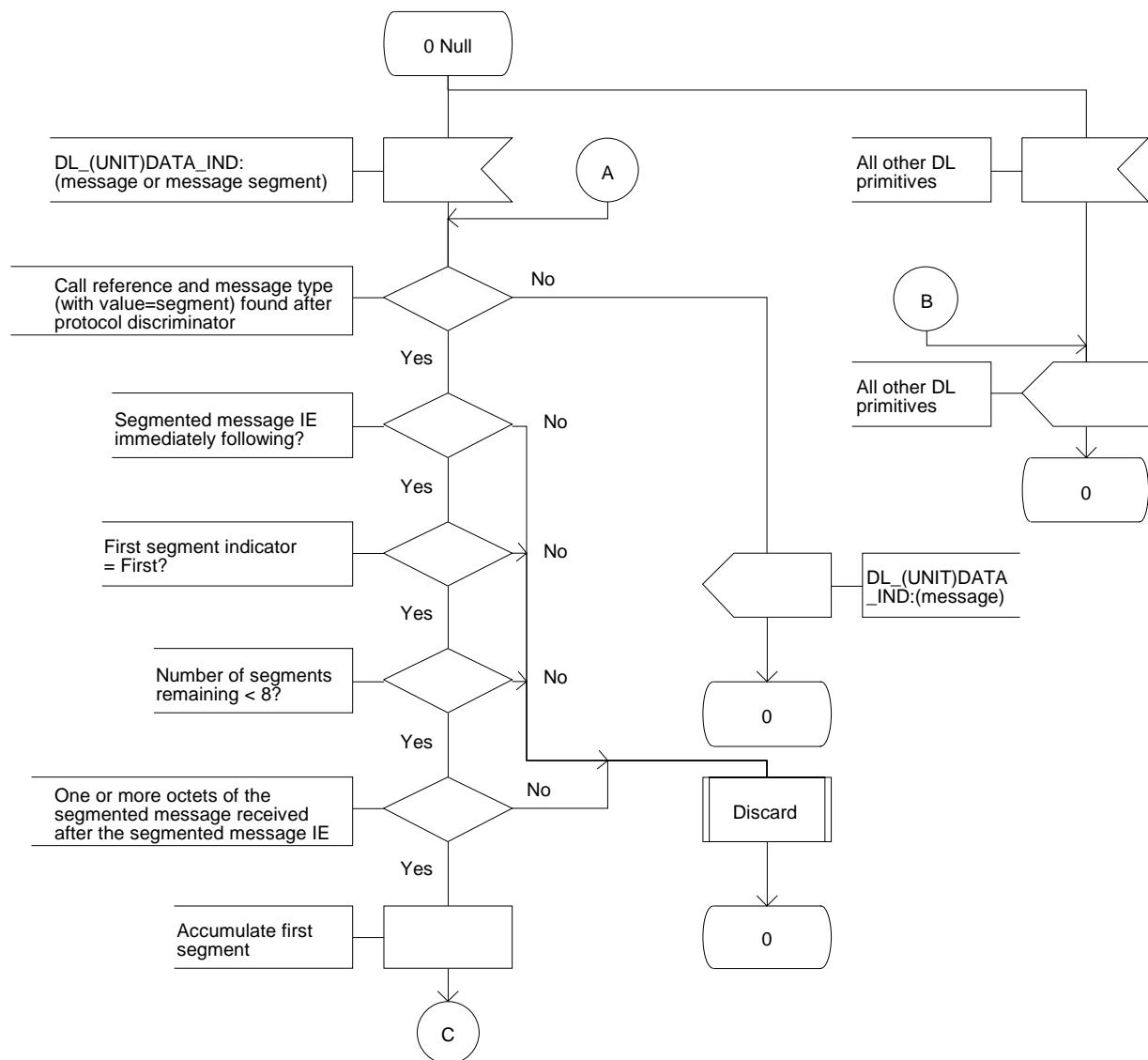
Replace figure H.5/Q.931 (3 sheets) by the following figure (5 sheets):

Figure H.5 (sheet 1 of 5): Message reassembler SDL

C

Store call
reference

N <- Number of
segments remaining

Set T314
(now + 4)s

1
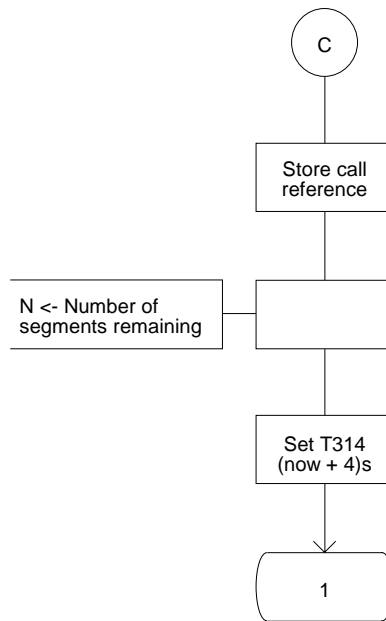
Figure H.5 (sheet 2 of 5): Message reassembler SDL

1 Receiving
segmented
message

DL_(UNIT)DATA_IND:
(message or message segment)

Call reference =
saved call reference?   No

Yes

Message type
= SEGMENT?   No

Yes

Segmented message
IE next element?   No

Yes

First segment
indicator = sub?   No

Yes

Number of segments
remaining = N-1?   No

Yes

One or more octets
of the segmented message
received after the
segmented message IE   No

Yes

Stop T314

Discard

A

Stop T314

Discard

0

D

Figure H.5 (sheet 3 of 5): Message reassembler SDL

ETSI
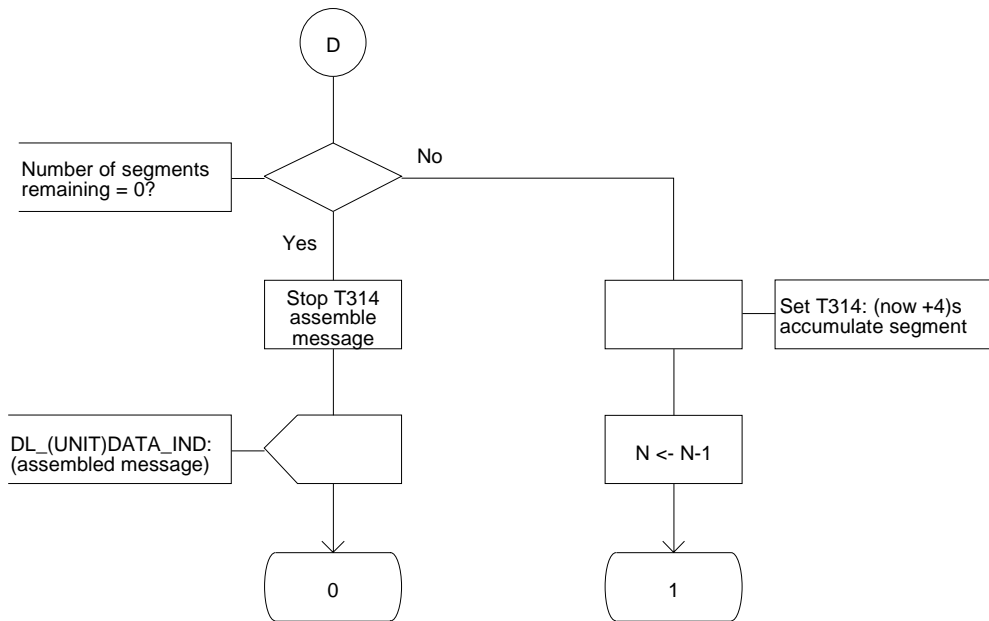
Figure H.5 (sheet 4 of 5): Message reassembler SDL
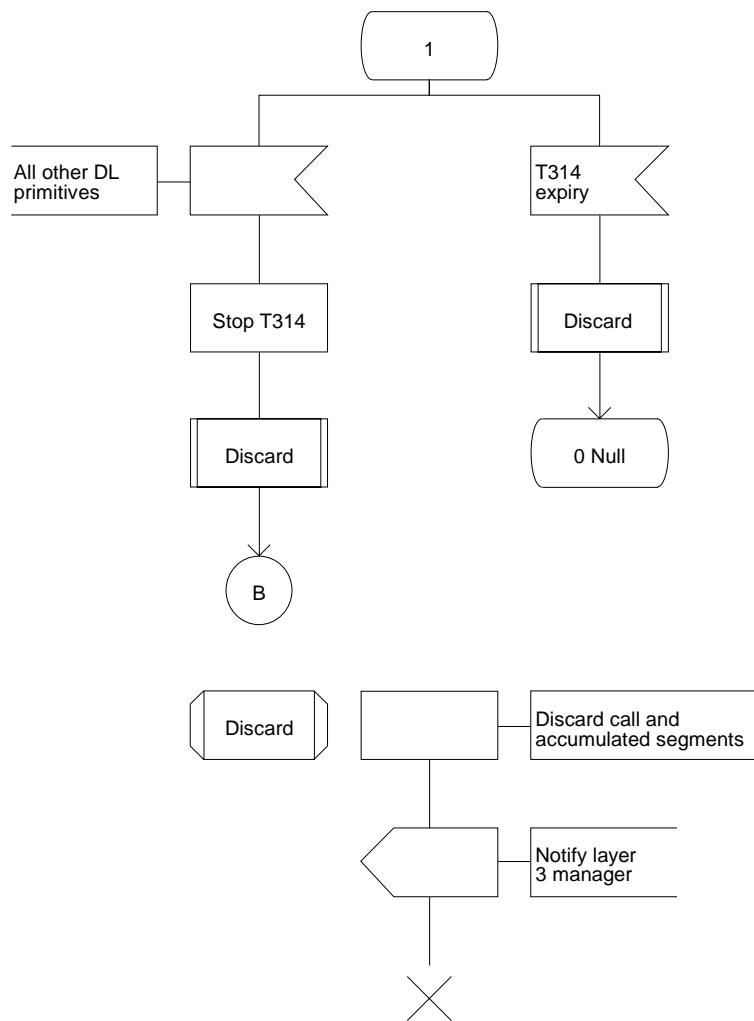
Figure H.5 (sheet 5 of 5): Message reassembler SDL

Pages 277 to 283, annex I

Annex I has the status of a normative annex.

Page 280, figure I.1/Q.931

Delete the note in figure I.1/Q.931.

Pages 281 and 282, subclause I.3.3, figures I.8, I.9 and I.10/Q.931

Delete subclause I.3.3 and figures I.8/Q.931 to I.10/Q.931. They are outside the scope of the present document.

Pages 282 and 283, clause I.4, figures I.11 and I.12/Q.931

Delete clause I.4, all of its subclauses and figures I.11/Q.931 and I.12/Q.931. They are outside the scope of the present document.

Pages 283 to 285, annex J

Annex J has the status of a normative annex.

Pages 283, annex J.3

Insert at the end of subclause J.3:

If bearer capability selection applies, and if a Low layer compatibility information element is returned by the called user in the CONNECT message, then the called user shall ensure that the information transfer attributes in that returned Low layer compatibility information element is the same as the information transfer attributes of the selected bearer capability.

Page 284, clause J.5

Delete subclause J.5. It is not applicable to the present document.

Page 285, annex K

Annex K has the status of a normative annex.

Page 285, clause K.1

Modify the first sentence of the first paragraph as follows:

For some applications, it is desirable to allow the completion of the transmission path associated with a bearer capability prior to receiving call acceptance.

Modify the last paragraph as follows:

The procedures described in this annex are only applicable to speech, 3,1 kHz audio and 64 kbit/s unrestricted digital information with tones/announcements bearer capabilities.

Delete the note.

Page 285, clause K.2

Insert at the end of the clause:

In networks conforming to the present document, the procedures described in this annex are optional. Networks which choose to implement these procedures shall ensure that they are not used on incoming international calls.

Page 286, annex L

Delete annex L. It is not applicable to the present document.

Pages 287 to 295, appendix I

Appendix I has the status of an informative annex.

Pages 296 to 308, appendix II

Delete appendix II. It is outside the scope of the present document.

Pages 309 to 311, appendix III

Delete appendix III. It is not applicable to the present document.

Annex ZA (informative):
Identification of changes from previous standards

ZA.1   Identification of changes from ETS 300 102-1 to ETS 300 403-1

This clause documents the main differences between ETS 300 102-1 (1990) and ETS 300 403-1 (1995).

ZA.1.1 Editorial changes

1) References and definitions of terms used in the present document have been added.

2) Annex D has been removed as symmetric call operation is now covered by ETS 300 172 which describes the layer 3 protocol for signalling between exchanges of private telecommunication networks for the control of circuit-switched calls.

3) The global call reference call state Null (Rest 0) has been renamed as Restart Null (Rest 0).

4) USER INFORMATION, CONGESTION CONTROL and FACILITY messages are no longer defined in the present document but in ETS 300 286-1 [107] and ETS 300 196-1 [105] respectively. The associated User-user, Congestion level, More data and Facility information elements are also no longer defined in the present document and have been removed from the descriptions of all messages in which they may be included.

5) The functional definition and content of the SEGMENT message has been defined in subclause 3.5.1.

6) Information elements related to packet communication and diversion supplementary services are deleted from table 4-3/Q.931. The information elements are defined in ETS 300 007 [98] and ETS 300 207-1 [106].

7) A table defining Bearer capability attributes has been added to subclause 4.5.5 (table 4-7) and to subclause 4.5.19 (table 4-17) in alignment with the ITU text.

8) The former annex H (examples of information element encoding) has been deleted.

9) "7 kHz audio" is now referred to as "unrestricted digital information with tones/announcements".

10) Some editorial changes have been made to the description of Subaddress information in the Called and Calling party subaddress information elements (octet 4) to align with the ITU-T text.

11) The Cause information element is no longer fully defined in the present document but reference made to ITU-T Recommendation Q.850 as modified by ETS 300 485 [113].

12) Text clarifying the encoding of "channel number" in the channel identification information element has been included in alignment with ITU-T text.

13) The subclauses describing call clearing have been redrafted to better align with the SDL diagrams. A collision of a RELEASE message with a DISCONNECT message has been defined explicitly as a clear collision and the text describing message type and message sequence errors (subclause 5.8.4) modified accordingly.

14) The subclauses describing restart procedures have been redrafted.

15) A new subclause 5.8.7.3 describing the behaviour on receipt of an "unexpected recognized information element" has been included in alignment with the ITU-T text.

16) The subclauses describing the procedures to be followed in case of data link reset and failure include specific requirements for the case of call offering on a broadcast data link.

17) The informative appendix III to ETS 300 102-1 which presented a summary of assigned information element identifier and message type codepoints has been removed.

18) The text in clause 5 of ETS 300 403-1 and the SDL diagrams of ETS 300 403-2 [112] together provide a complete specification of the protocol within the scope of the present document.

ZA.1.2 Technical changes

1) The Bearer capability and High layer compatibility information elements may now be included in the ALERTING, CALL PROCEEDING, CONNECT, and PROGRESS messages for support of BC and HLC selection.

2) The length of the Date/time information element in the CONNECT message is 2-8 octets instead of 2-7.

3) The Date/time information element may now be included in the network to user direction in the SETUP message.

4) The maximum length of the Display information element has been increased from 34 to 82 octets.

5) The Channel identification information element has been deleted from the CONNECT ACKNOWLEDGE message.

6) A new procedure has been defined to combine the two octet extension procedures in subclause 4.5.1, items e) and f).

7) Codeset 4, which is reserved for use by ISO/IEC standards, has been added.

8) Octets 4a and 4b of the Bearer capability information element have been removed and octet 4.1 (Rate multiplier) has been added. The maximum length of the Bearer capability information element is now 12 octets.

9) An information transfer rate (octet 4 of Bearer capability information element) codepoint has been added for circuit-mode multirate (64 kbit/s base rate) service.

10) The codepoint indicating "384 kbit/s video" (User information layer 1 protocol (octet 5) of Bearer capability information element) has been removed.

11) There were previously references in octet 5 of the Bearer capability and Low layer compatibility information elements to ITU-T Recommendations G.722 and G.725. The references have changed to ITU-T Recommendations H.221 and H.242.

12) The user rate (octet 5a of Bearer capability information element) indicating "rate is indicated by E-bits specified in Recommendation I.460" is now defined as "rate is indicated by E-bits specified in Recommendation I.460 or may be negotiated in-band".

13) Modem type codepoints (octet 5d of Bearer capability information element) have been changed to align with ITU-T values.

14) The use of the Presentation and Screening indicators is described in CLIR (see ETS 300 093-1 [103]). Two notes in subclause 4.5.10 have been deleted.

15) Cause information element values specific to ETSI have been deleted.

16) A new codepoint 0000101 "public land mobile networks, Q.1031/Q.1051" has been included in octet 3a of the cause information element (see ETS 300 485 [113]).

17) Some new cause values have been added (see ETS 300 485 [113]).

18) Some changes have been made to the use of the diagnostic field (see ETS 300 485 [113]).

19) The maximum length of the Channel identification information element has been changed from network dependent to 34 octets.

20) The H_0, H_{11} and H_{12} channels are not applicable to networks conforming to the present document.

21) The "slot map" is used in the Channel identification information element when supporting multirate (64 kbit/s base rate) services.

22) The Date/time information element has been moved from subclause 4.6 "Supplementary service information elements" in ETS 300 102-1 to subclause 4.5 "Other information elements" in the present document. An optional octet 8 "seconds" has been added.

23) The High layer compatibility information element may now be repeated in a SETUP message for selection purposes. This is in alignment with the ITU-T text.

24) A number of new codepoints for high layer and extended high layer characteristics identification have been added to the High layer compatibility information element (octets 4 and 4a).

25) The maximum length of the Low layer compatibility information element has been extended to 18 octets.

26) Octets 4a and 4b of the Low layer compatibility information element have been deleted and octets 4.1 (rate multiplier), 6a (mode of operation and Q.933 use), 6b (window size), 7a (mode of operation), 7b (default packet size) and 7c (packet window size) added in alignment with the ITU-T text.

27) A codepoint has been added to the Low layer compatibility information element information transfer rate (octet 4) for multirate (64 kbit/s base rate).

28) The codepoint indicating 384 kbit/s video (User information layer 1 protocol (octet 5) of Low layer compatibility information element) has been removed.

29) The user rate (octet 5a of Low layer compatibility information element) indicating "rate is indicated by E-bits specified in Recommendation I.460" is now defined as "rate is indicated by E-bits specified in Recommendation I.460 or may be negotiated in-band".

30) Modem type codepoints (octet 5d of Low layer compatibility information element) have been changed to align with the ITU-T values.

31) Additional codepoints have been defined for octet 6 (user information layer 2 protocol) and octet 7 (user information layer 3 protocol) of the Low layer compatibility information element in alignment with the ITU-T text.

32) The codepoint 0011 "transit network" has been added to octet 3a of the Progress indicator information element and the codepoint 0111 "international network" has been deleted.

33) A progress description #5 "interworking has occurred and has resulted in a telecommunication service change" has been added to the list of codepoints for octet 4 of the Progress indicator information element.

34) The Signal information element has been deleted.

35) Subclause 5.1.6, third paragraph: T322 is also not stopped, if running, if a PROGRESS message is received with a progress descriptor #1 or #2.

36) Subclause 5.2.6, fourth paragraph: T301, T310 and T322 are also not stopped, if running, if a PROGRESS message is received with a progress descriptor #1 or #2.

37) If the user or network indicate "channel is indicated, no acceptable alternative" and this channel does not exist, cause #82 "identified channel does not exist" is included in the RELEASE COMPLETE message (see subclauses 5.1.2 and 5.2.3.1).

38) When T313 expires, cause #102 "recovery on timer expiry" is used (see subclause 5.2.8).

39) When a SETUP message is sent via the broadcast data link, if a network disconnect indication is received during call establishment prior to the expiry of timer T312, timers T301 and T310 (in addition to timer T303) are stopped (see item e) of subclause 5.3.2).

40) Upon second expiry of timer T303, if implemented on the user side, the user sends a RELEASE COMPLETE message with cause #102 "recovery on timer expiry" (see item g) of subclause 5.3.2).

41) Separate state machines shall handle initiated and received restart requests respectively (see subclause 5.5).

42) If none of the specified channels have been returned to the idle condition when timer T317 expires, no action is taken (see subclause 5.5.2).

43) Restart error handling procedures have been defined (see subclause 5.5.3).

44) If the call suspension procedures are supported, the use of the NOTIFY message needs also to be supported.

45) The action to be taken on receipt of a SUSPEND message on a primary rate access is now defined (see subclause 5.6.3).

46) The error handling procedures of subclauses 5.8.1 through 5.8.7 are also valid for messages using the global call reference.

47) Procedures are specified for the case where an entity not supporting the restart procedure receives a message using the global call reference (see subclause 5.8.3.2).

48) The handling of unexpected DISCONNECT, RELEASE and RELEASE COMPLETE messages has been clarified (see subclause 5.8.4).

49) User equipment may pass cause values, location codes and diagnostics on to another entity even if those values are not recognized by the NT2 (see subclauses 5.8.6.2 and 5.8.7.2).

50) The network invokes the status enquiry procedure following a layer 2 re-establishment while layer 3 is in the active state (N10) (see subclause 5.8.10).

51) Wherever cause #97 "message type non-existent or not implemented" was specified in ETS 300 102-1, cause #98 "message not compatible with call state or message type non-existent or not implemented" may now be used if the equipment does not differentiate between "message not compatible with call state" and "message type non-extent or not implemented".

52) The option to retransmit the STATUS ENQUIRY message in the status enquiry procedure has been made dependent on the cause value received in the STATUS message (see subclause 5.8.10).

53) Subclauses defining basic telecommunication service and selection (subclause 5.10), signalling procedures for bearer capability selection (subclause 5.11), signalling procedures for high layer compatibility selection (subclause 5.12) and control of status request procedures (subclause 5.13) have been added to the present document.

54) Clause 8 describing circuit-mode multirate (64 kbit/s base rate) procedures has been added in alignment with the ITU-T text.

55) Table 9-1: The normal stop condition for timer T307 is on sending a RESUME ACKNOWLEDGE message.

56) Tables 9-1 and 9-2: The duration of T309 has been changed to 6 to 12 seconds and is applicable when the call is in the active state. It is now mandatory for both network and user sides.

57) Table 9-2: The default value of T310 has been changed to be in the range 30 to 100 seconds.

58) The use of progress indicator No. 1 has been clarified in annex G.

59) Some additional error handling procedures have been specified for the message segmentation procedure in annex H.

ZA.2 Identification of changes from ETS 300 403-1 to the EN 300 403-1 V1.2.2 (1998-04)

This clause documents the main differences between ETS 300 403-1 (1995) and the EN 300 403-1 V1.2.2 (1998-04).

ZA.2.1 Editorial changes

1) ETR 189/EG 201 189 is used for guidance and reference to values of the Protocol discriminator.

2) EN 300 196-1 [105] is referenced for generic length requirements of the Notification indicator information element.

3) The codepoint 1 "In-band negotiation not possible" has changed to "In-band negotiation possible" (octet 5a of Bearer capability information element).

4) The codepoint 011101 in octet 5d of the Bearer capability information element has been changed to 011100.

5) The codepoint 01111 in octet 5d of the Low layer compatibility information element has been changed to 00111.

6) The codepoint for "Audiovisual" is now called "Videotelephony".

7) The significance of the CONNECT message is local.

8) The codepoint for the Progress indicator has changed from 0011111 to 0011110 in figure 4-29/Q.931.

ZA.2.2 Technical changes

1) The codepoints indicating "38,4 kbit/s", "57,6 kbit/s" and "28,8 kbit/s" (octet 5a of Bearer capability information element) have been added.

2) The codepoint indicating "V.34 [97]" (octet 5d of Bearer capability information element) has been added.

3) Octet 4a, "Extended high layer characteristics identification" has been removed from the High layer capability information element.

4) Octet 4a, "Extended videotelephony characteristics identification" has been added to Higher layer compatibility information element.

5) The codepoints indicating "Videotelephony", "Videoconferencing", "Audiographic conferencing", and "Multimedia services" (octet 4 of Higher layer characteristics identification information element) have been added.

6) Codepoints for "Capability set of initial channel of H.221", "Capability set of subsequent channel of H.221" and "Capability set of initial channel associated with an active 3,1 kHz audio or speech call" (octet 4a for videotelephony of High layer characteristics identification information element) have been added.

7) The codepoint indicating "CCITT standardized rate adaption V.120" (octet 5 and 5b of Bearer capability information element) has been added.

8) The codepoints indicating "38,4 kbit/s", "57,6 kbit/s", and "28,8 kbit/s" (octet 5a of Low layer compatibility information element) have been added.

9) The codepoint indicating "V.34 [97]" (octet 5d of Low layer compatibility information element) has been added.

10) The handling of SETUP and RESUME messages with an incorrect call reference flag has been clarified.

11) Network options to pass octet 5b, 5c, 5d, 6 and 7 of the Bearer capability information element, the High layer compatibility information element and the Low layer compatibility information element even if the network cannot interpret the values have been added.

12) A user option to accept cause values, location codes and diagnostics even if the network cannot interpret the values has been added.

13) The handling of information elements with zero length has been clarified.

14) The handling of the network connection when receiving a STATUS message indicating the Null state, in any state except the Null state, has been clarified.

15) The handling of timers when sending a PROGRESS message with progress description #5 "interworking has occurred and resulted in a telecommunication service change" has been clarified.

16) The case when insufficient number of channels are subscribed to on a single interface to support a call has been clarified.

17) Optional subscription checks by originating and destination networks have been clarified.

18) The procedures for fallback have been clarified.

19) User-to-user compatibility checking and bearer service selection has been clarified.

20) The use of progress indicator No. 1 has been further clarified in annex G.

21) Some additional error handling procedures have been specified for the message segmentation procedure in annex H.

22) The requirement to compare Low layer compatibility information element in the CONNECT message to the selected bearer capability has been added in the procedures for low layer compatibility negotiation between users.

23) The optional procedure to include Keypad facility information element in the network to user direction in the SETUP message has been maintained due to backwards compatibility and is not recommended for future use.

24) The error procedures for the Call reference information element has been clarified.

ZA.3 Identification of changes from EN 300 403-1 V1.2.2 (1998-04) to the present document

This clause documents the main differences between EN 300 403-1 V1.2.2 (1998-04) and the present document.

ZA.3.1 Editorial changes

No change.

ZA.3.2 Technical changes

1) The Date/time information element representation of the year has been clarified to refer to the last two digits of the decimal representation of the year.

2) The Bearer capability and Low layer capability information elements have been extended to include the new codepoints to support a connection for IP traffic.

3) The Bearer capability and Low layer capability information elements have been extended with the two additional 7a* and 7b* that may be included if octet 7 indicates ISO/IEC TR9577.

4) The User information layer 1 protocol of the Bearer capability and Low layer capability information elements has been extended to include also the codepoint for the Recommendation H.223 [90] and H.245 [87].

Annex ZB (informative):
Identification of differences affecting terminal interchangeability with private ISDNs

ZB.1   Identification of changes from ETS 300 102-1 to ETS 300 403-1

ETS 300 192 (1992) is based on ETS 300 102-1 (1990) and CCITT Recommendation Q.931 (1988). Therefore, the differences identified in clause ZA.1 of the present document apply. In addition, the following differences exist:

1) All procedures applicable to the T reference point do not apply in ETS 300 192. Examples include subclause 5.6.7, and annex K of the present document.

2) When a DISCONNECT, RELEASE or RELEASE COMPLETE message is received with a non-mandatory information element with invalid contents, ETS 300 192 specifies that a STATUS message is not sent, but requires the inclusion of the cause value #100 "invalid information element contents" in the response message, if any. ETS 300 192 recommends the inclusion of the diagnostic in this cause value.

3) ETS 300 192 removes the network option (specified in subclause 5.8.7.2 of the present document) to truncate access information elements.

4) Instead of the requirement of subclause 5.2.4 of the present document for the network to clear responding terminals after a maximum number of other terminals have responded using the procedures of subclause 5.2.9 of the present document, ETS 300 192 offers an option of clearing such terminals with a RELEASE COMPLETE message with cause value #47 "resource unavailable". This option of sending RELEASE COMPLETE also applies to non-selected user clearing when insufficient resources are available to establish the state machine.

5) The use and contents of the addressing information elements are further defined by normative reference to ETS 300 189 (1992). In order to comply with ETS 300 189, ETS 300 192 defines various type of number values when the numbering plan identifier is set to private numbering plan.

6) When tones are provided by the network, ETS 300 192 requires the use of the appropriate progress description within the Progress indicator information element. In the present document, this is only an option, for example see subclause 5.1.3 of the present document. However, ETS 300 192 also recommends that the user attach to the B-channel at this point.

7) The requirements concerning the receipt of progress descriptions in a PROGESS message are different. For the originating side, ETS 300 192 includes progress description #8 in the requirement to stop timers, but excludes progress descriptions #2 and #4 from this list. For the destination side, ETS 300 192 excludes progress descriptions #3 and #4 from this list. ETS 300 192 requires only the stopping of timer T310.

8) Support by the network of annex J (low layer compatibility negotiation) is mandatory.

9) Transit network selection and network specific facilities are outside the scope of ETS 300 192.

10) In addition to the requirements specified in subclause 5.2.3.1 case 4) in the present document, ETS 300 192 allows the user to send cause #17 "user busy" as a response. Similar considerations apply to subclause 5.2.3.2 case b) in the present document.

11) ETS 300 192 precludes the use of the overlap receiving procedure. This is not necessarily a difference, as normal application of the present document would not require its use at a terminal interface (the coincident S and T reference point).

12) ETS 300 192 precludes the use of a second Cause information element (e.g. to indicate timer expiry) in a message. All cause values from 1 to 127 are defined to be valid cause values, but ETSI-specific cause values (coding standard "10") are not.

13) ETS 300 192 allows user timer T310 to be optional rather than mandatory, and, if implemented, the maximum value is allowed to be 120 seconds rather than 100 seconds. ETS 300 192 recommends a value be chosen near the maximum value.

14) ETS 300 192 specifies a tolerance on implemented timers. This ETS does not, although some regulatory testing does, and a tolerance must be supplied for conformance testing of the present document.

15) ETS 300 192 does not define the transport of the NOTIFY message, of the Notification indicator information element.

16) ETS 300 192 defines a codeset 5 information element called the Party category information element which may be included in the ALERTING, CONNECT, and SETUP messages. This information element is used to indicate the category of the call, e.g. operator, extension, or emergency extension.

17) ETS 300 192 provides for the usage of the Connected number information element and the Connected subaddress information element in the user-to-network direction within the CONNECT message. This ETS relies on ETS 300 097-1 to provide this functionality although it is defined as being part of basic call.

18) ETS 300 192 limits the usage of the Calling party number information element in the SETUP message from user to network, and the Connected number information element in the CONNECT message from user to network to situations where multiple subscriber number exists.

19) ETS 300 192 defines two new values of progress description (coding standard "10") to indicate that the call has come from or is going to the public ISDN. As a result, the progress indicator information element may appear up to three times in a message.

ZB.2 Identification of changes from ETS 300 403-1 to EN 300 403-1 V1.2

No additional changes have been identified.

ZB.3 Identification of changes from EN 300 403-1 V1.2 to V1.3

Changes to Date/time, information element to cater for Y2K.

Annex ZC (informative):
Editorial corrections to ITU-T Recommendation Q.931

The following editorial changes apply to ITU-T Recommendation Q.931 (1993).

Page	Location	Change
79	Figure 4-16	Change "Presentation indicataor" to "Presentation indicator"
131	5.1.5.1 Call proceeding, en-bloc sending	First paragraph, third line: Change "shal" to "shall"
148	5.8.1 Protocol discrimination error	Change "ignored," to "ignored. Ignore"
179	8.2.2.2 Point-to-multipoint configuration	Change "1)" to "a)"
180	Table 9-1, column heading	Change "Defaut" to "Default" (all pages)
180	Table 9-1	Timer T304: Change "values" to "value"
183	Table 9-1, note 1	Change "N200+1]" to "[N200+1]"
184	Table 9-2, column heading	Change "Defaut" to "Default" (all pages)
186	Table 9-2, note 1	Change "odified" to "modified"
265	E.1 Default provider	Last line: Change "5.8.7.1" to "5.8.7.2
265	E.2 Routing not supported	Change "unimplemented non-mandatory" to "unrecognized"

Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

-   ETR 018/EG 201 018: "Integrated Services Digital Network (ISDN); Application of the Bearer Capability (BC), High Layer Compatibility (HLC) and Low Layer Compatibility (LLC) information elements by terminals supporting ISDN services".

-   ETR 189/EG 201 189: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Master list of codepoints and operation values".

-   ITU-T Recommendation Q.939: "Typical DSS1 service indicator codings for ISDN telecommunications services".

History

Document history		
Edition 1	November 1995	Publication as ETS 300 403-1
V1.2.2	April 1998	Publication as EN 300 403-1
V1.3.1	July 1999	One-step Approval Procedure OAP 9949: 1999-07-07 to 1999-11-05
V1.3.2	November 1999	Publication