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**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**

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Foreword

This ETSI Technical Report (ETR) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI).

ETRs are informative documents resulting from ETSI studies which are not appropriate for European Telecommunication Standard (ETS) or Interim European Telecommunication Standard (I-ETS) status. An ETR may be used to publish material which is either of an informative nature, relating to the use or the application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or an I-ETS.

This third edition of ETR 018 replaces the second edition issued in November 1992.

The following modifications have been made as compared to the second edition:

- examples of the use of the circuit-mode multiple-rate bearer service have been added (see subclause 6.1.4);
- the codings of the telematic services have been aligned with the amendments to ETS 300 102-1 (see subclauses 6.3.2 and 6.3.3);
- examples for the Integrated Services Digital Network (ISDN) syntax-based videotex service using packet mode bearer capability have been added (see subclauses 6.3.3.3 and 6.3.3.4);
- the codings of the 7 kHz telephony teleservice and of the videotelephony teleservice have been aligned with ETS 300 267 (see subclauses 6.3.4 and 6.3.5);
- since the teletex service is no longer considered as a teleservice but as a terminal application of a bearer service, the corresponding codings have been moved to subclause 7.1.3.

Further enhancements of this ETR will (most likely) become necessary. Candidates for inclusion in a future fourth edition are e.g.:

- examples to document the user signalling bearer service;
- examples to document the teleaction teleservice;
- examples to document the file transfer teleservice;
- examples to support channel aggregation as an application of the 64 kbit/s unrestricted bearer service.

Introduction

This ETR specifies the coding of the information elements Bearer Capability (BC), High Layer Compatibility (HLC) and Low Layer Compatibility (LLC) to be used by terminals supporting the ISDN telecommunications services so far specified within ETSI and operating in the demand mode. It is based on ITU-T Recommendation Q.931 (1993) as modified by ETS 300 403-1, including its relevant annexes (B, I and J).

For each service it is specified which field values the calling user is requested to send and which field values the called user could expect to receive in a pure ISDN environment (Clauses 6 and 7). Clause 8 specifies the codings to be used in the case of inter-working with non European ISDNs supporting restricted 64 kbit/s transfer capability. Furthermore, interworking with the Public Switched Telephone Network (PSTN) is also covered (subclause 9.1).

Unless otherwise stated, the use of the term "terminal" refers to customer's terminal apparatus which may be a Terminal Equipment type 1 (TE1), a Terminal Adapter (TA) together with a Terminal Equipment type 2 (TE2) or a Network Termination type 2 (NT2) as defined in ITU-T Recommendation I.411.

The terms "terminal" and "user" are used interchangeably.

The exact bit patterns correlated with the named field values can be found in the following subclauses of ETS 300 403-1:

- in subclause 4.5.5 for the Bearer capability information element;
- in subclause 4.5.17 for the High layer compatibility information element; and
- in subclause 4.5.19 for the Low layer compatibility information element.

Generally, the information elements BC, HLC and LLC serve the following purposes:

At the calling side, the network checks that the bearer service requested by the calling user in the Bearer capability information element matches with the bearer service provided to that user by the network (see ETS 300 403-1, annex B).

At the called side, the called user performs network-to-user compatibility checking based on the content of the BC-information element, and user-to-user compatibility checking based on the content of the HLC- and LLC- information elements (see ETS 300 403-1, annex B).

1 Scope

This ETSI Technical Report (ETR) provides supplementary information on the usage of the compatibility information elements Bearer Capability (BC), High Layer Compatibility (HLC) and Low Layer Compatibility (LLC) for individual telecommunications services. It considers the telecommunications services as they are specified for public Integrated Services Digital Networks (ISDNs). It does not specify additional codings of the compatibility information elements which might be required to support the request and provision of telecommunications services by private networks.

Since some bearer services can be used to support various user applications, additional information on such applications is specified:

- in subclause 7.1 for the circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service;
- in subclause 7.2 for the circuit-mode 64 kbit/s 8 kHz structured 3,1 kHz audio bearer service.

The specific objective of this ETR is to provide guidance on the correct usage of ETS 300 403-1 [5] codepoints to the different ETSI Technical Committees or Technical Subcommittees dealing with services, ISDN terminals, Terminal Adapters (TAs) and documents on testing. This ETR shall help to assure interoperability of terminals supporting the same telecommunication service and shall enable terminals to operate on different public ISDNs.

The typical codings specified in clause 6 should be supported by all users and networks supporting the corresponding telecommunications service. Other variants of these codings may be supported in addition, however, these variants might not provide for world-wide interoperability and might not guarantee terminal interchangeability.

The coding examples given in clause 7 are not exhaustive. They illustrate typical user applications involving bit rate adaption schemes where ETSI standardized interfaces are used.

clause 8 is devoted to examples showing the interworking of European ISDNs with non-European ISDNs supporting restricted 64 kbit/s transfer capability.

Finally, clause 9 presents codings when interworking with non-ISDNs occurs.

2 References

This ETR incorporates by dated or undated reference, provisions from other publications. These references are cited at the appropriate places in the text and the publications listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 080: "Integrated Services Digital Network (ISDN); ISDN lower layer protocols for telematic terminals".
- [2] ETS 300 103 (1990): "Integrated Services Digital Network (ISDN); Support of CCITT Recommendation X.21, X.21 bis and X.20 bis based Data Terminal Equipments (DTEs) by an ISDN; Synchronous and asynchronous terminal adaption functions".
- [3] ETS 300 218 (1993): "Integrated Services Digital Network (ISDN); Syntax-based Videotex lower layers protocols for ISDN packet mode (CCITT Recommendation X.31 Case A and Case B)".
- [4] ETS 300 264 (1993): "Integrated Services Digital Network (ISDN); Videotelephony teleservice; Service description".
- [5] ETS 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1); User-network interface layer 3 specification for basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

- [6] ITU-T Recommendation F.184: "Operational provisions for the international public facsimile service between subscriber stations with group 4 facsimile machines (telefax 4)".
- [7] CCITT Recommendation F.200: "Teletex service".
- [8] CCITT Recommendation F.220: "Service requirements unique to the processable mode number one (PM1) used within the teletex service".
- [9] CCITT Recommendation F.230: "Service requirements unique to the mixed mode (MM) used within the teletex service".
- [10] CCITT Recommendation T.90 (1992): "Characteristics and protocols for terminals for telematic services in ISDN".
- [11] CCITT Recommendation V.110 (1992): "Support of data terminal equipments with V-Series type interfaces by an Integrated Services Digital Network (ISDN)".
- [12] ITU-T Recommendation X.25: "Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit".
- [13] ITU-T Recommendation X.30 (1992): "Support of X.21, X.21 bis and X.20 bis based data terminal equipments (DTEs) by an Integrated Services Digital Network (ISDN)".
- [14] ITU-T Recommendation X.31 (1993): "Support of packet mode terminal equipment by an ISDN".
- [15] ITU-T Recommendation X.75: "Packet-switched signalling system between public networks providing data transmission services".

3 Abbreviations

For the purposes of this ETR, the following abbreviations apply:

AU	Access Unit
BC	Bearer Capability
CSPDN	Circuit Switched Public Data Network
HDLC	High Level Data Link Control
HLC	High Layer Compatibility
ISDN	Integrated Services Digital Network
LLC	Low Layer Compatibility
MSN	Multiple Subscriber Number
NIC	Network Independent Clock
NT	Network Termination
PSPDN	Packet Switched Public Data Network
PSTN	Public Switched Telephone Network
SAPI	Service Access Point Identifier
SUB	Subaddressing
TA	Terminal Adapter
TE	Terminal Equipment

4 General principles applicable to all services

For all services, the following principles apply:

- a) the LLC information element is transferred transparently through an ISDN between the calling entity and the addressed entity. However, dependent on the charging principles applied, some networks may perform checks on the length of the LLC information elements;
- b) the HLC information element is transferred transparently through an ISDN between the calling entity and the addressed entity. However, some networks may check its content, e.g., to associate a supplementary service to a teleservice;
- c) where bearer services are specified, the HLC information element will normally not be present unless they are used to support high layer applications;
- d) the coding examples consider the general case. In special terminal arrangements the user may need to rely on address information only. In these cases the Multiple Subscriber Number (MSN) supplementary service shall be used;
- e) a Terminal Equipment type 2 (TE2) together with a TA are assumed to provide the same functionality as a Terminal Equipment type 1 (TE1). Therefore, a TA should not generate and send a progress indicator when setting-up a connection. Consequently, a TA, e.g., adapting a two-wire analogue Public Switched Telephone Network (PSTN) user-network interface to the ISDN user-network interface will generate the BC and, if appropriate, the HLC and LLC information elements in accordance with the type of equipment it serves at the interface at the R reference point, namely:

Equipment connected to an interface at the R reference point	BC-/HLC-/LLC-codepoints used at an interface at the coincident S&T reference point		
	BC	HLC	LLC
analogue telephone	speech	telephony	
facsimile group 2/3 equipment	3,1 kHz audio	facsimile group 2/3	
voice band data equipment via modem	3,1 kHz audio		modem type

For the presentation of the coding examples, the following conventions apply:

- octets 1 and 2 of the compatibility information elements, indicating the information element identifier and length respectively, are omitted from the considerations and therefore not shown in the examples;
- a dash instead of a field value indicates:
 - a) at the calling side: this field is not included in the information element;
 - b) at the called side: this field is not present;
- field values in brackets () may or may not be included at the calling side and therefore not be present at the called side.

5 Impact of interworking situations

5.1 Incoming calls from non-ISDNs

In the case of interworking with non-ISDNs, HLC and LLC information elements may be absent, and this interworking is shown with the presence of the Progress indicator information element. When this occurs, the terminal should accept the incoming call according to annex B of ETS 300 403-1 [5], i.e. it should regard the compatibility as successful if it is compatible with the included information, which as a minimum will be the Bearer capability information element.

5.2 BC and LLC application guidelines

In many cases, the same low layer information (e.g., the user rate and the rate adaption technique applied) can be coded in either the BC or the LLC information element. However, the provision of information in the one or the other information element has consequences with respect to the selection or the denial of a network provided interworking function.

The following guidelines exist for the application of BC and LLC information elements according to annex I of ETS 300 403-1 [5]:

- Type I Information used only at the destination end to allow decision regarding terminal compatibility. This information, if required, shall be coded into octets (3a and) 5 to 7 of the LLC information element.
- Type II Information to permit the network to select the bearer service. This information shall be coded into:
- octets 3 and 4 of the BC information element for circuit-mode traffic;
 - octets 3 and 4, 6 and 7 of the BC information element for packet-mode traffic.
- Type III Information used by the addressed user to determine terminal compatibility and used by the network to facilitate interworking with other ISDNs or other dedicated networks. This information is encoded into octet 5 (including octets 5a-5d if appropriate) of the BC information element.

These types of information can be used as follows:

- Case 1 If the originating user wishes to transfer information end-to-end to ensure end user compatibility without invoking network interworking, then type I information together with type II information shall apply.
- Case 2 If the originating user either requires network interworking or is willing to accept network interworking, should it be necessary in order to complete the call, then type III information together with type II information shall apply.

Consequently, if interworking with a PSTN, Circuit Switched Public Data Network (CSPDN) or the pan-European mobile cellular system is supported by the network by providing the appropriate functions (i.e. data extraction, modem pool) at the interworking unit, then those calls carrying the rate adaption information in the LLC information element may not be successfully completed. These calls will be successful instead, when the rate adaption information is included in the BC information element.

Terminals shall have the capability to determine compatibility independent of whether the compatibility information is coded in the BC information element (as type III information) or in the LLC information element (as type I information).

6 Request and recognition of a basic telecommunications service in a "pure" ISDN environment

The examples given in this clause assume that a pure ISDN environment exists and no network-provided interworking function is selected.

Therefore, the particular user rate as well as the rate adaption technique applied are specified in the LLC information element, thus permitting compatibility decision by the destination terminal.

6.1 Request and recognition of a circuit-mode bearer service

6.1.1 Circuit-mode 64 kbit/s 8 kHz structured bearer service category usable for speech information transfer

6.1.1.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	speech
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element shall not be included.

c) Low layer compatibility information element coding:

This information element is not required.

6.1.1.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	speech
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Terminals supporting circuit-mode 64 kbit/s 8 kHz structured speech bearer service shall be able to accept incoming calls from terminals which include the HLC information element (see subclause 6.3.1.2). If an HLC information element for telephony is received and the terminal supports HLC analysis, it shall consider the compatibility check to be successful if the HLC information element is coded as specified in subclause 6.3.1.2).

If an HLC information element is not received, the call shall be accepted if the compatibility checks on the BC and LLC information element (if present) are successful.

c) Low layer compatibility information element coding:

This information element is normally absent. If present, it may be used for compatibility checking or be ignored by the terminal. If any conflict from duplication of the information in the BC and LLC information elements is detected, the conflict shall be resolved in favour of the BC information element, i.e., the conflicting information in the LLC information element shall be ignored.

6.1.2 Circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category

More specific user applications of this bearer service can be found in clause 7.

Interworking with networks using restricted digital information transfer is covered in clause 8.

6.1.2.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is optional. If present, it shall be encoded in accordance with ETS 300 403-1 [5], subclause 4.5.17.

c) Low layer compatibility information element coding:

This information element is optional. If present, it shall be encoded in accordance with ETS 300 403-1 [5], subclause 4.5.19.

6.1.2.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is present if provided by the calling user. If present, it is checked for terminal compatibility according to annex B of ETS 300 403-1 [5].

c) Low layer compatibility information element coding:

This information element is present if provided by the calling user. If present, it is checked for terminal compatibility according to annex B of ETS 300 403-1 [5] and for parameter negotiation according to annex J of ETS 300 403-1 [5].

6.1.3 Circuit-mode 64 kbit/s 8 kHz structured bearer service category usable for 3,1 kHz audio information transfer

More specific user applications of this bearer service can be found in clause 7.

6.1.3.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	3,1 kHz audio
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is optional. If present, it shall be encoded in accordance with ETS 300 403-1 [5], subclause 4.5.17.

c) Low layer compatibility information element coding:

This information element is optional. If present, it shall be encoded in accordance with ETS 300 403-1 [5], subclause 4.5.19.

6.1.3.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	3,1 kHz audio
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is present if provided by the calling user. If present, it is checked for terminal compatibility according to annex B of ETS 300 403-1 [5].

c) Low layer compatibility information element coding:

This information element is present if provided by the calling user. If present, it is checked for terminal compatibility according to annex B of ETS 300 403-1 [5] and for parameter negotiation according to annex J of ETS 300 403-1 [5].

6.1.4 Circuit-mode multiple-rate unrestricted 8 kHz structured bearer service category

6.1.4.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	multirate (note)
4.1	Rate multiplier	multiplier to the base rate 64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

NOTE: The bearer channels used for a given call are indicated in the Channel identification information element according to ETS 300 403-1 [5], subclause 4.5.13.

b) High layer compatibility information element coding:

This information element is optional. If present, it shall be coded in accordance with ETS 300 403-1 [5], subclause 4.5.17.

c) Low layer compatibility information element coding:

This information element is optional. If present, it shall be encoded in accordance with ETS 300 403-1 [5], subclause 4.5.19.

6.1.4.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	multirate (note)
4.1	Rate multiplier	multiplier to the base rate 64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

NOTE: The bearer channels used for a given call are indicated in the Channel identification information element according to ETS 300 403-1 [5], subclause 4.5.13.

b) High layer compatibility information element coding:

This information element is present if provided by the calling user. If present, it is checked compatibility according to annex B of ETS 300 403-1 [5].

c) Low layer compatibility information element coding:

This information element is present if provided by the calling user. If present, it is checked for terminal compatibility according to annex B of ETS 300 403-1 [5], and for parameter negotiation according to annex J of ETS 300 403-1 [5].

6.2 Packet mode bearer service categories

6.2.1 Virtual call bearer services (support of X.25 terminal equipment allowing access to the ISDN virtual circuit service (ITU-T Recommendation X.31, Case B))

The coding examples given below assume that a new access connection is required between the terminal and the packet handler function.

6.2.1.1 Access through the B-channel

6.2.1.1.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	packet mode
	Information transfer rate	00000: packet mode
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	Recommendation X.25, link layer
7	User information layer 3 protocol	Recommendation X.25, packet layer

b) High layer compatibility information element coding:

This information element is not included.

c) Low layer compatibility information element coding:

This information element is not included.

6.2.1.1.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	packet mode
	Information transfer rate	00000: packet mode
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	Recommendation X.25, link layer
7	User information layer 3 protocol	Recommendation X.25, packet layer

b) High layer compatibility information element coding:

The HLC information element is not present.

c) Low layer compatibility information element coding:

The LLC information element is not present.

6.2.1.2 Access through the D-channel

6.2.1.2.1 Request by a calling terminal equipment

The calling terminal accesses a packet handler function by establishing a link layer connection (SAPI = 16) to that function which can then be used to support packet communications according to ITU-T Recommendation X.25 [12] layer 3 procedures. Consequently, ETS 300 403-1 [5] procedures are not required to provide D-channel access.

6.2.1.2.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	packet mode
	Information transfer rate	00000: packet mode
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	Recommendation Q.921
7	User information layer 3 protocol	Recommendation X.25, packet layer

b) High layer compatibility information element coding:

The HLC information element is not present.

c) Low layer compatibility information element coding:

The LLC information element is not present.

6.3 Request and recognition of a teleservice

6.3.1 Telephony 3,1 kHz teleservice

6.3.1.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	speech
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	telephony
4a	Extended high layer characteristics identification	_____

c) Low layer compatibility information element coding:

The LLC information element is not required. If present, its content shall be identical to the BC information element.

6.3.1.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	speech
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	————
7	User information layer 3 protocol	————

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	telephony
4a	Extended high layer characteristics identification	————

The HLC Information element may or may not be present. If present, it shall be coded as depicted.

c) Low layer compatibility information element coding:

The LLC information element is normally absent. If present, it may be used for compatibility checking or be ignored by the terminal. If any conflict from duplication of the information in the BC and LLC information elements is detected, the conflict shall be resolved in favour of the BC information element, i.e., the conflicting information in the LLC information element shall be ignored.

6.3.2 Telefax G4 service (using circuit-mode bearer capability)

6.3.2.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	————
6	User information layer 2 protocol	————
7	User information layer 3 protocol	————

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	group 4 class 1 facsimile
4a	Extended high layer characteristics identification	————

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	(set according to the capability of the terminal)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	_____
5a	Synchron/asynchron	_____
	Negotiation	
	User rate	
5b	Intermediate rate	_____
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
	Assignor/assignee	
In-band/outband negotiation		
5c	Number of stop bits	_____
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	
6	User information layer 2 protocol	ISO/IEC 7776 DTE-DTE operation (note 1)
6a, 6b	Optional layer 2 protocol information	(set according to the capability of the terminal) (note 3)
7	User information layer 3 protocol	ISO/IEC 8208 (note 2)
7a-7c	Optional layer 3 protocol information	(set according to the capability of the terminal) (note 3)
NOTE 1: This codepoint is also used when the protocol defined in ITU-T Recommendation X.75 [15] modified by the application rules specified in ETS 300 080 [1] is applied.		
NOTE 2: Additional application rules as specified in ETS 300 080 [1] need to be fulfilled.		
NOTE 3: The extension octets 6a-6b and 7a-7c may also be used to negotiate protocol options or parameters.		

6.3.2.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardised coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	note
4a	Extended high layer characteristics identification	_____
NOTE: The called terminal holds a list of field values describing its receiving capabilities. It will accept calls with HLC codings corresponding to any one in the list. Intercommunication between basic-mode and mixed-mode teletex terminals and classes I, II and III group 4 facsimile terminals is shown in CCITT Recommendation T.90 [10], table 2/T.90.		

c) Low layer information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	(set according to the capability of the terminal)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	_____
5a	Synchron/asynchron	_____
	Negotiation	
	User rate	
5b	Intermediate rate	_____
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
	Assignor/assignee	
In-band/outband negotiation		
5c	Number of stop bits	_____
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	
6	User information layer 2 protocol	ISO/IEC 7776 DTE-DTE operation
6a, 6b	Optional layer 2 protocol information	(check according to the capability of the terminal) (note)
7	User information layer 3 protocol	ISO/IEC 8208
7a-7c	Optional layer 3 protocol information	(set according to the capability of the terminal) (note)
NOTE: The extension octets 6a-6b and 7a-7c may also be used to negotiate protocol options or parameters.		

A terminating terminal should check whether a LLC information element is included in the SETUP message or not. If the LLC information element is omitted, the default values will be assumed, i.e. ISO/IEC 7776 DTE-DTE operation as layer 2 protocol and ISO/IEC 8208 as layer 3 protocol (see also subclause 6.3.2.1, item c), notes 1 and 2).

6.3.3 Syntax-based videotex teleservice

Two different types of connections are possible between a videotex terminal and the videotex service access function, namely:

- circuit-switched connections; and
- packet-switched connections.

In the case of circuit-switched connections two different access-network scenarios have to be distinguished:

- the ISDN provides for an end-to-end circuit-switched link between the terminal function and the videotex access function (the codings for this scenario are covered in subclause 6.3.3.1); and
- the ISDN provides for an circuit-switched link between the terminal function and an Access Unit (AU) of a Packet Switched Public Data Network (PSPDN) according to ITU-T Recommendation X.31 [14], Case A. The videotex service is accessed via this AU. The codings for this scenario are covered in subclause 6.3.3.2.

In the case of packet-switched connections, also two different access network scenarios have to be considered:

- access to the videotex service through the B-channel using the ISDN virtual circuit service according to ITU-T Recommendation X.31 [14], Case B (see subclause 6.3.3.3); and
- access to the videotex service through the D-channel using the ISDN virtual circuit service according to ITU-T Recommendation X.31 [14], Case B (see subclause 6.3.3.4).

6.3.3.1 Access to the syntax-based videotex teleservice using an end-to-end circuit-switched connection

6.3.3.1.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	syntax-based videotex (Recommendations F.300 and T.102)
4a	Extended high layer characteristics identification	_____

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	(set according to the capability of the terminal)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	_____
5a	Synchron/asynchron	
	Negotiation	
	User rate	
5b	Intermediate rate	
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
	Assignor/assignee	
In-band/outband negotiation		
5c	Number of stop bits	_____
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	
6	User information layer 2 protocol	ISO/IEC 7776 DTE-DTE operation (notes 1 and 2)
6a, 6b	Optional layer 2 protocol information	(set according to the capability of the terminal) (note 3)
7	User information layer 3 protocol	ISO/IEC 8208 (note 2)
7a-7c	Optional layer 3 protocol information	(set according to the capability of the terminal) (note 3)
NOTE 1: This codepoint is also used when the protocol defined in ITU-T Recommendation X.75 [15] modified by the application rules specified in ETS 300 080 [1] is applied.		
NOTE 2: Additional application rules as specified in ETS 300 080 [1] need to be fulfilled.		
NOTE 3: The extension octets 6a-6b and 7a-7c may also be used to negotiate protocol options or parameters.		

6.3.3.1.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	syntax-based videotex (Recommendations F.300 and T.102)
4a	Extended high layer characteristics identification	_____

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	(set according to the capability of the terminal)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	_____
5a	Synchron/asynchron	_____
	Negotiation	
	User rate	
5b	Intermediate rate	_____
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
	Assignor/assignee	
In-band/outband negotiation		
5c	Number of stop bits	_____
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	
6	User information layer 2 protocol	ISO/IEC 7776 DTE-DTE operation
6a, 6b	Optional layer 2 protocol information	(check according to the capability of the terminal) (note)
7	User information layer 3 protocol	ISO/IEC 8208
7a-7c	Optional layer 3 protocol information	(check according to the capability of the terminal) (note)
NOTE: The extension octets 6a-6b and 7a-7c may also be used to negotiate protocol options or parameters.		

A terminating terminal should check whether a LLC information element is included in the SETUP message or not. If the LLC information element is omitted, the default values will be assumed, i.e. ISO/IEC 7776 DTE-DTE operation as layer 2 protocol and ISO/IEC 8208 as layer 3 protocol (see also subclause 6.3.3.1.1, item c), notes 1 and 2).

6.3.3.2 Access to the syntax-based videotex teleservice via a PSPDN access unit (ITU-T Recommendation X.31, Case A)

6.3.3.2.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardised coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is not included.

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	_____
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	(CCITT standardized rate adaption X.31 HDLC flag stuffing) (note 1)
5a	Synchron/asynchron	_____
	Negotiation	
	User rate	
5b	Intermediate rate	_____
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
Assignor/assignee		
In-band/outband negotiation		
5c	Number of stop bits	_____
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	
6	User information layer 2 protocol	Recommendation X.25, link layer (note 2)
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	Recommendation X.25, packet layer
7a-7c	Optional layer 3 protocol information	_____

NOTE 1: This octet is only included when rate adaption is applied.

NOTE 2: Additional application rules as defined in ETS 300 218 [3] need to be fulfilled.

6.3.3.2.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is not present.

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	_____
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	(CCITT standardized rate adaption X.31 HDLC flag stuffing) (note 1)
5a	Synchron/asynchron	_____
	Negotiation	
	User rate	
5b	Intermediate rate	_____
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
	Assignor/assignee	
In-band/outband negotiation		
5c	Number of stop bits	_____
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	
6	User information layer 2 protocol	Recommendation X.25, link layer (note 2)
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	Recommendation X.25, packet layer
7a-7c	Optional layer 3 protocol information	_____
NOTE 1: This octet is only present when rate adaption is applied.		
NOTE 2: Additional application rules as defined in ETS 300 218 [3] are applied.		

6.3.3.3 Access to the syntax-based videotex service using a packet-switched connection through the B-channel

The codings shown in this subclause are indistinguishable from those for the packet mode bearer services (see subclause 6.2). Consequently, terminal selection can only be made by using the MSN or Subaddressing (SUB) supplementary services.

6.3.3.3.1 Request by a calling terminal

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	packet mode
	Information transfer rate	00000: packet mode
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	Recommendation X.25, link layer
7	User information layer 3 protocol	Recommendation X.25, packet layer

b) High layer compatibility information element coding:

The HLC information element is not included.

c) Low layer compatibility information element coding:

The LLC information element is not included.

6.3.3.3.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	packet mode
	Information transfer rate	00000: packet mode
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	Recommendation X.25, link layer
7	User information layer 3 protocol	Recommendation X.25, packet layer

b) High layer compatibility information element coding:

This information element is not present.

c) Low layer compatibility information element coding:

This information element is not present.

6.3.3.4 Access to the syntax-based videotex service using a packet-switched connection through the D-channel

6.3.3.4.1 Request by a calling terminal using the D-channel

The calling terminal accesses a packet handler function by establishing a link layer connection (SAPI = 16) to that function which can then be used to support packet communications according to ITU-T Recommendation X.25 [12] layer 3 procedures. Consequently, ETS 300 403-1 [5] procedures are not required to provide D-channel access.

6.3.3.4.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	packet mode
	Information transfer rate	00000: packet mode
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	Recommendation Q.921
7	User information layer 3 protocol	Recommendation X.25, packet layer

b) High layer compatibility information element coding:

This information element is not present.

c) Low layer compatibility information element coding:

This information element is not present.

6.3.4 Telephony 7 kHz teleservice

The coding examples given in this subclause assume that bearer capability and high layer compatibility selection are not allowed by the calling terminal. Therefore, only the coding typical for the telephony 7 kHz teleservice is shown.

If the calling terminal allows fallback to occur to an alternative bearer capability, i.e. to the telephony 3,1 kHz teleservice, then the terminal shall indicate this to the network by means of repeated BC information elements within the SETUP message. The order of the information elements indicates the priority of the bearer capabilities i.e. the first BC information element has lowest and the second has highest priority. Therefore, in the case of fallback being allowed to telephony 3,1 kHz teleservice, the first BC information element shall be coded as depicted in subclause 6.3.1. The second BC information element shall be coded as depicted in this example.

6.3.4.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information with tones/ announcements (notes 1 and 2)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendations H.221 and H.242 (notes 2 and 3)
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

NOTE 1: This codepoint was formerly labelled "7 kHz audio".
 NOTE 2: The information transfer capability used by this teleservice requires additional signalling capabilities within the network. This may delay the introduction in some ISDNs. Similar capabilities may be possible using the 64 kbit/s unrestricted bearer service. In the case of octet 3 specifying unrestricted digital information transfer capability, compatibility with some networks requires octet 5 to be absent, except in the case of interworking with networks supporting 56 kbit/s transfer capability.
 NOTE 3: The codings given for octets 5 and 5a in subclause 8.1 will be used for interworking with 56 kbit/s networks.

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	telephony
4a	Extended high layer characteristics identification	_____

c) Low layer compatibility information element coding:

If fallback is permitted, the LLC information element is not included.

If fallback is not permitted, the LLC information element may be included. If included, its content shall be identical to the BC information element.

6.3.4.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information with tones/ announcements (notes 1, 2 and 3)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation H.221 and H.242 (notes 2 and 3)
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____
NOTE 1: This codepoint was formerly labelled "7 kHz audio".		
NOTE 2: A user equipment intended to interoperate with user equipment supporting the 7 kHz telephony application over a 64 kbit/s unrestricted 8 kHz structured bearer service category shall consider the 64 kbit/s bearer capability as being compatible with this particular coding. In this case octet 5 may also be absent.		
NOTE 3: See also subclause 6.3.4.1, item a), notes 2 and 3.		

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	telephony
4a	Extended high layer characteristics identification	_____

c) Low layer compatibility information element coding:

If fallback is permitted, the LLC information element is not present.

If fallback is not permitted, the LLC information element may be present. If present, it may be used for compatibility checking or be ignored by the terminal. If any conflict from duplication of the information in the BC and LLC information elements is detected, the conflict shall be resolved in favour of the BC information element, i.e. the conflicting information in the LLC information element shall be ignored.

6.3.5 Videotelephony teleservice

For this service, two sets of codings are included in this subclause. Subclause 6.3.5.1 shows the codings as they are finally required for the support of the videotelephony teleservice as specified in ETS 300 264 [4]. Subclause 6.3.5.2 provides codings additionally to those of subclause 6.3.5.1. These codings can be used when networks are involved in videotelephony calls, which, for an interim period of time, do not support the videotelephony teleservice i.e. these networks do not support either or both the BC coding "unrestricted digital information with tones/announcements" and the fallback procedure.

6.3.5.1 Codings required for the service specified in ETS 300 264

The codings shown in this subclause are based on the assumption that this service requires two connections with 64 kbit/s transfer capability each. If the videotelephony call requires only one 64 kbit/s connection, then the coding example of the first connection applies.

This subclause only covers the ISDN videotelephony teleservice as specified in ETS 300 264 [4]. Other audiovisual services such as video conference service, audiographic conference service and audiovisual interactive service are not covered in this subclause.

6.3.5.1.1 First connection

If the calling terminal allows fallback to occur to an alternative bearer capability and high layer compatibility, then the terminal shall indicate this to the network by means of repeated BC and HLC information elements within the SETUP message.

- a) To indicate that a videotelephony teleservice is required with fallback allowed to telephony 3,1 kHz, the user shall set:
 - the first HLC information element included in the SETUP message to "telephony"; and
 - the second HLC information element as specified in this subclause; and
 - the first BC information element included in the SETUP message to "speech" as specified in subclause 6.3.1; and
 - the second BC information element as specified in the following example.
- b) To indicate that a videotelephony teleservice is required with fallback allowed to telephony 7 kHz, the user shall set:
 - the first HLC information element included in the SETUP message to "telephony"; and
 - the second HLC information element as specified in this subclause; and
 - the BC information element as specified in this subclause. It shall be present only once.

If the calling terminal does not allow fallback to occur, then only one BC and one HLC information element shall be sent within the SETUP message, and they shall be coded as specified in the following examples.

6.3.5.1.1.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information with tones/announcements (note)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendations H.221 and H.242
6	User information layer 2 protocol	————
7	User information layer 3 protocol	————
NOTE: This codepoint was formerly labelled "7 kHz audio".		

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	videotelephony (Recommendation F.721) (note)
4a	Extended high layer characteristics identification	capability set of initial channel of Recommendation H.221
NOTE: This codepoint was formerly labelled "audiovisual".		

c) Low layer compatibility information element coding:

If fallback is permitted, the LLC information element is not included.

If fallback is not permitted, the LLC information element may be included. If included, its contents shall be identical to the BC information element.

6.3.5.1.1.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information with tones/announcements (note)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendations H.221 and H.242
6	User information layer 2 protocol	————
7	User information layer 3 protocol	————
NOTE: This codepoint was formerly labelled "7 kHz audio".		

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	videotelephony (Recommendation F.721) (note)
4a	Extended high layer characteristics identification	capability set of initial channel of Recommendation H.221
NOTE: This codepoint was formerly labelled "audiovisual".		

c) Low layer compatibility information element coding:

If fallback is permitted, the LLC information element is not present.

If fallback is not permitted, the LLC information element may be present. If present, its contents shall be identical to the BC information element, and it may be used for compatibility checking or be ignored by the terminal. If any conflict from duplication of the information in the BC and LLC information elements is detected, the conflict shall be resolved in favour of the BC information, i.e. the conflicting information in the LLC information element shall be ignored.

NOTE: The LLC coding of "Recommendations H.221 and H.242" in conjunction with the BC coding given in subclause 8.2 do not represent a conflict.

6.3.5.1.2 Second connection

6.3.5.1.2.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendations H.221 and H.242 (note)
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

NOTE: Compatibility with some networks outside Europe requires octet 5 to be absent.

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	videotelephony (Recommendation F.721) (note)
4a	Extended videotelephony characteristics identification	capability set of subsequent channel of Recommendation H.221

NOTE: This codepoint was formerly labelled "audiovisual".

c) Low layer compatibility information element coding:

This information element is optional. If present, it shall be coded to indicate "Recommendations H.221 and H.242" in octet 5, and with octets 3 and 4 identical to the BC information element.

6.3.5.1.2.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendations H.221 and H.242 (note)
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

NOTE: Compatibility with some networks outside Europe requires octet 5 to be absent.

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	videotelephony (Recommendation F.721) (note)
4a	Extended videotelephony characteristics identification	capability set of subsequent channel of Recommendation H.221
NOTE: This codepoint was formerly labelled "audiovisual".		

c) Low layer compatibility information element coding:

If present, this information element may be used for compatibility checking or be ignored by the terminal. If any conflict from duplication of the information in the BC and LLC information elements is detected, the conflict shall be resolved in favour of the BC information, i.e. the conflicting information in the LLC information element shall be ignored.

6.3.5.2 Codings required for short term procedures

For an interim period of time some European or non-European networks may not support the BC codepoint "unrestricted digital information with tones/announcements" and/or the fallback procedure. The user may obtain an equivalent service, without fallback and without tones and announcements, by requesting the circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category. In order for this alternative service mechanism to operate, the destination user will also have to support this bearer service category. As a short term solution, terminals supporting the videotelephony teleservice according to ETS 300 264 [4] may support, in addition to the codings specified in subclause 6.3.5.1, the codings given in this subclause.

6.3.5.2.1 Request by a calling terminal equipment

a) Bearer capability information element coding (first and second connection):

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information (note 1)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendations H.221 and H.242 (notes 2 and 3)
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____
NOTE 1: When this codepoint is used, fallback cannot occur in the network and the network will not provide tones and announcements. Furthermore, the network cannot recognize the call as a videotelephony call.		
NOTE 2: Compatibility with some networks requires octet 5 to be absent, except in the case of interworking with networks supporting 56 kbit/s transfer capability.		
NOTE 3: The codings given for octets 5 and 5a in subclause 8.1 will be used for interworking with 56 kbit/s networks.		

b1) High layer compatibility information element coding (first connection):

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	videotelephony (Recommendation F.721) (note 1)
4a	Extended videotelephony characteristics identification	capability set of initial channel of Recommendation H.221 (note 2)
NOTE 1: This codepoint was formerly labelled "audiovisual".		
NOTE 2: Implementations based on ETS 300 102-1 may not use this octet.		

If octet 3 of the BC information element specifies unrestricted digital information, then this information element may be absent.

b2) High layer compatibility information element coding (second connection):

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	videotelephony (Recommendation F.721) (note 1)
4a	Extended videotelephony characteristics identification	capability set of subsequent channel of Recommendation H.221 (note 2)
NOTE 1: This codepoint was formerly labelled "audiovisual".		
NOTE 2: Implementations based on ETS 300 102-1 may not use this octet.		

If octet 3 of the BC information element specifies unrestricted digital information, then this information element may be absent.

c) Low layer compatibility information element coding:

This information element is not required.

In the case of octet 3 of the BC information element specifying unrestricted digital information, this information element may be included specifying octets 3 and 4 identical to the BC information element, and indicating "Recommendations H.221 and H.242" in octet 5.

6.3.5.2.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information (note 1)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendations H.221 and H.242 (notes 2 and 3)
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____
NOTE 1: If this codepoint is received, octet 5 may be absent.		
NOTE 2: If octet 3 specifies "unrestricted digital information", this octet may be absent.		
NOTE 3: User equipment intended to interoperate with dedicated networks supporting 56 kbit/s transfer capability shall consider the codings given in subclause 8.2 also to be compatible.		

b1) High layer compatibility information element coding (first connection):

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	videotelephony (Recommendation F.721) (note 1)
4a	Extended videotelephony characteristics identification	capability set of initial channel of Recommendation H.221 (note 2)
NOTE 1: This codepoint was formerly labelled "audiovisual".		
NOTE 2: Implementations based on ETS 300 102-1 may not use this octet.		

In some cases the HLC information element may not be present. If present, it can be used for compatibility checking.

b2) High layer compatibility information element coding (second connection):

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	videotelephony (Recommendation F.721) (note 1)
4a	Extended videotelephony characteristics identification	capability set of subsequent channel of Recommendation H.221 (note 2)
NOTE 1: This codepoint was formerly labelled "audiovisual".		
NOTE 2: Implementations based on ETS 300 102-1 may not use this octet.		

In some cases the HLC information element may not be present. If present, it can be used for compatibility checking.

c) Low layer compatibility information element coding:

If octet 3 of the BC information element specifies unrestricted digital information, then this information element may be present with octets 3 and 4 identical to the BC information element content and octet 5 specifying "Recommendations H.221 and H.242". If present, it may be used for compatibility checking or be ignored by the terminal. If any conflict from duplication of the information in the BC and LLC information elements is detected, the conflict shall be resolved in favour of the BC information element, i.e. the conflicting information in the LLC information element shall be ignored.

NOTE: The LLC coding of "Recommendation H.221 and H.242" in conjunction with the BC coding given in subclause 8.2 do not represent a conflict.

6.3.6 Facsimile group 2/3 service

Although this service is not defined by ETSI as an ISDN service in its own right, it has been included as it bears some similarities to other ISDN services.

6.3.6.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	3,1 kHz audio
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	facsimile group 2/3 (Recommendation F.182)
4a	Extended videotelephony characteristics identification	_____

c) Low layer compatibility information element coding:

The LLC information element is not included.

6.3.6.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	3,1 kHz audio
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	facsimile group 2/3 (Recommendation F.182)
4a	Extended high layer characteristics identification	_____

c) Low layer compatibility information element coding:

The LLC information element is normally not present. If present, it shall be ignored by the terminal.

7 Coding examples applicable to specific user applications

7.1 Specific user applications of the circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service

The examples presented in this clause are typical applications of this bearer service. They are not exhaustive. Further applications are possible.

Furthermore, it is assumed that a pure ISDN environment exists and no network provided interworking function is selected. Therefore, the particular user rate as well as the rate adaption technique applied are specified in the LLC information element, thus permitting compatibility decision only by the destination terminal.

7.1.1 Support of terminal adapters V.110/X.30

7.1.1.1 Synchronous mode of operation

7.1.1.1.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	High layer protocol profile
4	High layer characteristics identification	set according to the high layer application supported by the terminal
4a	Extended high layer characteristics identification	_____

The HLC information element shall only be included if a terminal supporting a high layer application is connected to the TA (e.g. a teletex terminal).

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	(set according to the capability of the TA)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	(CCITT standardized rate adaption V.110/X.30)
5a	Synchron/asynchron	synchronous
	Negotiation	(set according to the capability of the TA)
	User rate	user rate at reference point R
5b	Intermediate rate	(set according to the user rate)
	NIC on transmission	(set by the user according to the capability of the TA)
	NIC on reception	(set by the user according to the capability of the TA)
	Flow control on transmission	(irrelevant, set to 0)
	Flow control on reception	(irrelevant, set to 0)
	Rate adaption header	_____
	Multiple frame support	_____
	Mode of operation	_____
5c	Logical link identifier negotiation	_____
	Assignor/assignee	_____
	In-band/outband negotiation	_____
	Number of stop bits	_____
5d	Number of data bits	_____
	Parity information	_____
5d	Duplex mode	note 2
	Modem type	(irrelevant)
6	User information layer 2 protocol	(set according to user layer 2 protocol)
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	(set according to user layer 3 protocol)
7a-7c	Optional layer 3 protocol information	_____
NOTE 1: TAs according to ITU-T Recommendation X.30 [13] supporting user class of service 19 (64 kbit/s) will not include octet 5b.		
NOTE 2: Where a TA wishes to indicate the mode of operation (half or full duplex), then octet 5d will be present with the modem type being not relevant. In this case, octet 5c needs to be present but is irrelevant.		

7.1.1.1.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	check according to the high layer application supported by the terminal
4a	Extended videotelephony characteristics identification	_____

Depending on the type of terminal connected to the calling TA, the HLC information element may be present (e.g. a teletex terminal).

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	(check according to the capability of the TA)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	(CCITT standardized rate adaption V.110/X.30)
5a	Synchron/asynchron	synchronous
	Negotiation	(check according to the capability of the TA)
	User rate	check this value according the user rate at reference point R
5b	Intermediate rate	(check according to the capability of the TA)
	NIC on transmission	(check according to the capability of the TA)
	NIC on reception	
	Flow control on transmission	ignore
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	_____
	Logical link identifier negotiation	
Assignor/assignee		
5c	In-band/outband negotiation	
	Number of stop bits	
	Number of data bits	_____
5d	Parity information	
	Duplex mode	(check according to the capability of the TE2 supported)
	Modem type	ignore
	User information layer 2 protocol	(check according to user layer 2 protocol supported by the terminal)
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	(check according to user layer 3 protocol supported by the terminal)
7a-7c	Optional layer 3 protocol information	_____
NOTE: In the case of TAs according to ITU-T Recommendation X.30 [13] supporting user class of service 19 (64 kbit/s), octet 5b will not be present. The field values in brackets may or may not be checked by the receiving TA.		

7.1.1.2 Asynchronous mode of operation

7.1.1.2.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	set according to the high layer application supported by the terminal
4a	Extended high layer characteristics identification	_____

The HLC information element shall only be included if a terminal supporting a high layer application is connected to the TA (e.g. a teletex terminal).

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	(set according to the capability of the TA)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	CCITT standardized rate adaption V.110/X.30
5a	Synchron/asynchron	asynchronous
	Negotiation	(set according to the capability of the TA)
	User rate	user rate at reference point R
5b	Intermediate rate	(set according to the user rate)
	NIC on transmission	irrelevant, set to "0"
	NIC on reception	irrelevant, set to "0"
	Flow control on transmission	(set according to the capability of the TA)
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	_____
	Logical link identifier negotiation	
5c	Assignor/assignee	
	In-band/outband negotiation	
	Number of stop bits	
5d	Number of data bits	(set according to the capability of the TA)
	Parity information	
5d	Duplex mode	(set according to user's requirements)
	Modem type	irrelevant
6	User information layer 2 protocol	(set according to user layer 2 protocol)
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	(set according to user layer 3 protocol)
7a-7c	Optional layer 3 protocol information	_____

7.1.1.2.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	check according to the high layer application supported by the terminal
4a	Extended high layer characteristics identification	_____

Depending on the type of terminal connected to the calling TA, the HLC information element may be present (e.g. a teletex terminal).

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	(set according to the capability of the TA)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	CCITT standardized rate adaption V.110/X.30
5a	Synchron/asynchron	asynchronous
	Negotiation	(check according to the capability of the TA) (note)
	User rate	check according to the user rate at reference point R (note)
5b	Intermediate rate	(check according to the capability of the TA) (note)
	NIC on transmission	ignore
	NIC on reception	
	Flow control on transmission	(check according to the capability of the TA)
	Flow control on reception	(note)
	Rate adaption header	
	Multiple frame support	
	Mode of operation	———
	Logical link identifier negotiation	
	Assignor/assignee	
In-band/outband negotiation		
5c	Number of stop bits	
	Number of data bits	(check according to the capability of the TA)
	Parity information	
5d	Duplex mode	(check according to the capability of the TE2 supported)
	Modem type	ignore
6	User information layer 2 protocol	(check according to user layer 2 protocol)
6a, 6b	Optional layer 2 protocol information	———
7	User information layer 3 protocol	(check according to user layer 3 protocol)
7a-7c	Optional layer 3 protocol information	———
<p>NOTE: The following cases may occur:</p> <p>a) if there is a match of the fields "user rate", intermediate rate" and "flow control" then there will be no in-band parameter exchange required;</p> <p>b) if these field values do not match, then call acceptability is dependent on in-band negotiation results according to CCITT Recommendation V.110 [11].</p> <p>The field values in brackets may or may not be checked by the receiving TA.</p>		

7.1.2 Support of X.25 terminal equipment allowing access to PSPDN via an access unit (ITU-T Recommendation X.31, Case A)

7.1.2.1 Rate adaption using X.31 HDLC flag stuffing

7.1.2.1.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

The HLC information element is not included.

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	_____
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	(CCITT standardized rate adaption X.31 HDLC flag stuffing) note
5a	Synchron/asynchron	_____
	Negotiation	_____
	User rate	_____
5b	Intermediate rate	_____
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
Assignor/assignee		
In-band/outband negotiation		
5c	Number of stop bits	_____
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	_____
6	User information layer 2 protocol	Recommendation X.25, link layer
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	Recommendation X.25, packet layer
7a-7c	Optional layer 3 protocol information	_____
NOTE: The absence of octet 5 indicates that HDLC flag stuffing applies.		

7.1.2.1.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

The HLC information element is not present.

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	_____
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	(CCITT standardized rate adaption X.31 HDLC flag stuffing) (note)
5a	Synchron/asynchron	_____
	Negotiation	
	User rate	
5b	Intermediate rate	_____
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
	Assignor/assignee	
In-band/outband negotiation		
5c	Number of stop bits	_____
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	
6	User information layer 2 protocol	Recommendation X.25, link layer
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	Recommendation X.25, packet layer
7a-7c	Optional layer 3 protocol information	_____

NOTE: The absence of octet 5 indicates that HDLC flag stuffing applies.

7.1.2.2 Rate adaption corresponding to CCITT Recommendations V.110/X.30

7.1.2.2.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

The HLC information element is not included.

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	_____
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	(CCITT standardized rate adaption V.110/X.30)
5a	Synchron/asynchron	synchronous
	Negotiation	in-band negotiation not possible
	User rate	user rat at reference point R
5b	Intermediate rate	(set corresponding to user rate at R)
	NIC on transmission	(set according to the capability of the TA) (note)
	NIC on reception	(set according to the capability of the TA) (note)
	Flow control on transmission	note
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
Assignor/assignee		
In-band/outband negotiation		
5c	Number of stop bits	
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	_____
6	User information layer 2 protocol	Recommendation X.25, link layer
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	Recommendation X.25, packet layer
7a-7c	Optional layer 3 protocol information	_____

NOTE: Octet 5b may be present. If present, only the NIC bits are relevant.

7.1.2.2.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is not present.

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	-----
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	(CCITT standardized rate adaption V.110/X.30)
5a	Synchron/asynchron	synchronous
	Negotiation	not possible
	User rate	check user rate at reference point R
5b	Intermediate rate	(check or ignore)
	NIC on transmission	(check according to the capability of the TA) (note)
	NIC on reception	(check according to the capability of the TA) (note)
	Flow control on transmission	note
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
Logical link identifier negotiation		
Assignor/assignee		
In-band/outband negotiation		
5c	Number of stop bits	_____
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	_____
6	User information layer 2 protocol	Recommendation X.25, packet layer
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	Recommendation X.25, packet layer
7a-7c	Optional layer 3 protocol information	_____

NOTE: Octet 5b may be present. If present, only the NIC bits are relevant.

7.1.3 Support of teletex terminals using circuit-mode 64 kbit/s unrestricted 8 kHz-structured bearer capability

7.1.3.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	note
4a	Extended high layer characteristics identification	

NOTE: The calling terminal shall select the field value according to its capabilities and according to the type of document to be transferred:

- teletex service, basic mode of operation (CCITT Recommendation F.200 [7]). This coding shall be used by terminals supporting basic operation only; or
- teletex service, basic and mixed mode of operation (CCITT Recommendation F.230 [9]) and facsimile service group 4 classes II and III (ITU-T Recommendation F.184 [6]). This coding shall be used by terminals which want to operate in the mixed mode of operation. The same codepoint may be used by terminals which want to operate facsimile group 4 classes II or III; or
- teletex service, basic and processable mode of operation (CCITT Recommendation F.220 [8]). This coding shall be used by terminals which want to operate in the processable mode of operation.

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	(set according to the capability of the terminal)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	_____
5a	Synchron/asynchron	_____
	Negotiation	
	User rate	
5b	Intermediate rate	_____
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
	Assignor/assignee	
In-band/outband negotiation		
5c	Number of stop bits	_____
	Number of data bits	
	Parity information	
5d	Duplex mode	_____
	Modem type	
6	User information layer 2 protocol	ISO/IEC 7776 DTE-DTE operation (note 1)
6a, 6b	Optional layer 2 protocol information	(set according to the capability of the terminal) (note 3)
7	User information layer 3 protocol	ISO/IEC 8208 (note 2)
7a-7c	Optional layer 3 protocol information	(set according to the capability of the terminal) (note 3)
NOTE 1: This codepoint is also used when the protocol defined in ITU-T Recommendation X.75 [15] modified by the application rules specified in ETS 300 080 [1] is applied.		
NOTE 2: Additional application rules as specified in ETS 300 080 [1] need to be fulfilled.		
NOTE 3: The extension octets 6a-6b and 7a-7c may also be used to negotiate protocol options or parameter.		

7.1.3.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Interpretation	first high layer characteristics identification to be used in the call
	Presentation method of protocol profile	high layer protocol profile
4	High layer characteristics identification	note
4a	Extended high layer characteristics identification	_____
NOTE: The called terminal holds a list of field values describing its receiving capabilities. It will accept calls with calls with HLC codings corresponding to any one in the list.		

c) LLC information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
3a	Negotiation indicator	(check according to the capability of the terminal)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	_____
5a	Synchron/asynchron	
	Negotiation	_____
	User rate	
5b	Intermediate rate	
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	_____
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
	Assignor/assignee	
In-band/outband negotiation		
5c	Number of stop bits	
	Number of data bits	_____
	Parity information	
5d	Duplex mode	_____
	Modem type	
6	User information layer 2 protocol	ISO/IEC 7776 DTE-DTE operation
6a, 6b	Optional layer 2 protocol information	(check according to the capability of the terminal) (note)
7	User information layer 3 protocol	ISO/IEC 8208
7a-7c	Optional layer 3 protocol information	(check according to the capability of the terminal) (note)
NOTE: The extension octets 6a-6b and 7a-7c may also be used to negotiate protocol options or parameters.		

A terminating terminal should check whether a LLC information element is included in the SETUP message or not. If the LLC information element is omitted, the default values will be assumed, i.e. ISO/IEC 7776 DTE-DTE operation as layer 2 protocol and ISO/IEC 8208 as layer 3 protocol (see also subclause 7.1.3.1, item c), notes 1 and 2).

7.2 Specific user applications of the circuit mode 64 kbit/s 8 kHz structured bearer service category usable for 3,1 kHz audio information transfer

The codings presented in this subclause consider a typical application of this bearer service. They are not exhaustive. Further applications are possible.

Furthermore, it is assumed that a pure ISDN environment exists and no network provided interworking function is selected. Therefore, the particular terminal characteristics are specified in the LLC information element, thus permitting compatibility decision only by the destination terminal.

7.2.1 Voice band data via modem

7.2.1.1 Request by a calling terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	3,1 kHz audio
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

The HLC information element is not included.

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	3,1 kHz audio
3a	Negotiation indicator	_____
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	Recommendation G.711, A-law
5a	Synchron/asynchron	(may be set depending on the user's requirements)
	Negotiation	
	User rate	
5b	Intermediate rate	not relevant but cannot be omitted in order to have octet 5d
	NIC on transmission	
	NIC on reception	not relevant but cannot be omitted in order to have octet 5d
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
Logical link identifier negotiation		
Assignor/assignee		
In-band/outband negotiation		
5c	Number of stop bits	(may be set depending on the user's requirements)
	Number of data bits	
	Parity information	
5d	Duplex mode	set according to the modem type
	Modem type	set according to the modem type
6	User information layer 2 protocol	(set according to user layer 2 protocol)
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	(set according to user layer 3 protocol)
7a-7c	Optional layer 3 protocol information	_____

Depending on the user's requirements, the whole LLC information element may be absent.

7.2.1.2 Compatibility at the called terminal equipment

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	3,1 kHz audio
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

The presence of a progress description indicates that the call originates from the PSTN.

b) High layer compatibility information element coding:

The HLC information element is not present.

c) Low layer compatibility information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	3,1 kHz audio
3a	Negotiation indicator	_____
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
Layer 1		
5	User information layer 1 protocol	Recommendation G.711, A-law
5a	Synchron/asynchron	(check according to the capability of the user's equipment)
	Negotiation	
	User rate	
5b	Intermediate rate	ignore
	NIC on transmission	
	NIC on reception	
	Flow control on transmission	
	Flow control on reception	
	Rate adaption header	
	Multiple frame support	
	Mode of operation	
	Logical link identifier negotiation	
	Assignor/assignee	
In-band/outband negotiation		
5c	Number of stop bits	check according to the capability of the user's equipment
	Number of data bits	
	Parity information	
5d	Duplex mode	check according to the capability of the user's equipment
	Modem type	check according to the capability of the user's equipment
6	User information layer 2 protocol	(check according to user layer 2 protocol supported by the terminal)
6a, 6b	Optional layer 2 protocol information	_____
7	User information layer 3 protocol	(check according to user layer 3 protocol supported by the terminal)
7a-7c	Optional layer 3 protocol information	_____

The LLC information element should be checked against the capability of the user's equipment. In the case of interworking with the PSTN indicated by the presence of a progress description, the LLC information element will be absent.

8 Interworking with non-European ISDNs supporting restricted 64 kbit/s transfer capability

8.1 Request by a calling terminal connected to a network supporting 64 kbit/s unrestricted digital information transfer

This example assumes that the calling user is aware of the interworking situation.

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	CCITT standardized rate adaption V.110/X.30
5a	Synchronous/asynchronous	synchronous
	Negotiation	not possible
	User rate	56 kbit/s Recommendation V.6
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is optional. If present, it shall be encoded in accordance with ETS 300 403-1 [5], subclause 4.5.17.

c) Low layer compatibility information element coding:

This information element is optional. If present, it shall be encoded in accordance with ETS 300 403-1 [5], subclause 4.5.19.

8.2 Compatibility at the called terminal equipment connected to a network supporting 64 kbit/s unrestricted digital information transfer

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	unrestricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	CCITT standardized rate adaption V.110/X.30
5a	Synchronous/asynchronous	synchronous
	Negotiation	not possible
	User rate	56 kbit/s Recommendation V.6
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is present if provided by the calling user. If present, it is checked for terminal compatibility according to annex B of ETS 300 403-1 [5].

c) Low layer compatibility information element coding:

This information element is present if provided by the calling user. If present, it is checked for terminal compatibility according to annex B of ETS 300 403-1 [5] and for parameter negotiation according to annex J of ETS 300 403-1 [5].

8.3 Request by a calling terminal connected to a non-European network supporting 64 kbit/s restricted digital information transfer

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	restricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is optional. If present, it shall be encoded in accordance with ETS 300 403-1 [5], subclause 4.5.17.

c) Low layer compatibility information element coding:

This information element is optional. If present, it shall be encoded in accordance with ETS 300 403-1 [5], subclause 4.5.19.

8.4 Compatibility at the called terminal equipment connected to a non-European network using restricted digital information transfer

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	restricted digital information
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	_____
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

b) High layer compatibility information element coding:

This information element is present if provided by the calling user. If present, it is checked for terminal compatibility according to annex B of ETS 300 403-1 [5].

c) Low layer compatibility information element coding:

This information element is present if provided by the calling user. If present, it is checked for terminal compatibility according to annex B of ETS 300 403-1 [5] and for parameter negotiation according to annex J of ETS 300 403-1 [5].

9 Codings in the case where non-ISDNs are involved

9.1 Calls from PSTN to ISDN

A call originated in the PSTN, supported by conventional signalling prior to arrival at the ISDN interworking point, will belong to one of the three indistinguishable services:

- speech; or,
- voice band data via modem; or,
- facsimile group 2/3 service.

At the interworking point, the bearer capability "3,1 kHz audio" shall be assigned to the call.

A progress indicator shall also be applied to mark a non-ISDN call source.

The following example shows the coding of the compatibility information elements in the case where conventional signalling was applied prior to arrival at the ISDN interworking point.

a) Bearer capability information element coding:

Octet	Information element field	Field value
3	Coding standard	CCITT standardized coding
	Information transfer capability	3,1 kHz audio (note)
4	Transfer mode	circuit mode
	Information transfer rate	64 kbit/s
5	User information layer 1 protocol	Recommendation G.711, A-law
6	User information layer 2 protocol	_____
7	User information layer 3 protocol	_____

NOTE: The field value 3,1 kHz audio is accompanied by a progress indicator. This progress indicator indicates to the ISDN terminal that interworking with the PSTN has occurred.

b) High layer compatibility information element coding:

The HLC information element is not present.

c) Low layer compatibility information element coding:

The LLC information element is not present.

9.2 Calls from PSPDN to ISDN

See ITU-T Recommendation X.31 [14], subclause 6.2.

9.3 Calls from CSPDN to ISDN

See ETS 300 103 [2].

Annex A: Bibliography

- 1) ETS 300 102-1 (1990): "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".
- 2) ETS 300 267 (1993): "Integrated Services Digital Network (ISDN); Telephony 7 kHz and videotelephony teleservices - Digital Subscriber Signalling System No. one (DSS1) protocol".
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