Standard ECMA-106
3rd Edition - December 1993

ECMA

Standardizing Information and Communication Systems

Private Telecommunication Networks (PTN) - Signalling Protocol at the S Reference Point - Circuit Mode Basic Services

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(SSIG-BC)

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Brief history

This Standard is one of a series of ECMA standards defining services and signalling protocols applicable to Private Telecommunication Networks (PTNs). The series uses the ISDN concepts as developed by the ITU-T and is also within the framework of standards for open systems interconnection as defined by ISO. It has been produced under ITSTC work items M-IT-05 4.3.1.1 and 4.4 for Bon de commande 75D.5.

This particular Standard defines the signalling protocol for use at the S reference point in support of basic circuit mode services. It is intended to be supported by a suitable layer 2 protocol, for example Standard ECMA-105, in the D-channel of a basic access interface or a primary rate access interface.

The 1st Edition of Standard ECMA-106 was published by ECMA in 1985. A 2nd Edition was published by ECMA in June 1991, to extend the scope to include the connection of all types of Terminal Equipment to Private Telecommunication Networks, instead of just the connection of Data Processing Equipment to Private Circuit-Switching Networks, and to reflect work undeway in ETSI on the corresponding standard for public ISDNs in Europe.

The protocol defined in this 3rd Edition of Standard ECMA-106 is based upon that now specified in ETS 300 102-1. ETS 300 102-1 is applicable to interfaces to public ISDNs at the T reference point, or at coincident S and T reference points if there is no NT2 function. This ECMA Standard references many of the clauses of ETS 300 102-1 to avoid reproducing large quantities of text. Some of the options in ETS 300 102-1 are not applicable to interfaces at the S reference point, and therefore are excluded by this Standard. On the other hand, certain additions have been identified as being required at the S reference point. However, the major part of the protocol is identical with that specified in ETS 300 102-1, enabling TEs to be designed which are compatible with both PTNs and public ISDNs and can therefore be connected to either.

This ECMA Standard refers to ETS 300 102-2 for the description of the protocol in SDL form.

Compared to the 2nd Edition of Standard ECMA-106, various changes have been made in order to achieve alignment with ETS 300 192 (which is based on the 2nd Edition of ECMA-106 but modified during ETSI Public Enquiry and published by ETSI in December 1992).

Further, this 3rd Edition of Standard ECMA-106 includes a PICS proforma (annex G), which has itself been forwarded to ETSI as a proposed Amendment to ETS 300 192.

This Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC1, ITU-T, ETSI and other international, regional and national standardization bodies. It represents a pragmatic and widely based consensus.

Adopted as 3rd Edition of Standard ECMA-106 by the General Assembly of December 1993.

Table of contents

1 Scope

This Standard defines the Layer 3 protocol for signalling for the support of circuit-mode bearer services (used either on their own or in support of teleservices) at an interface at the S reference point between a Terminal Equipment (TE) and a Private Telecommunication Network (PTN). The S reference point is defined in ENV 41004.

This Standard is based upon ETS 300 102-1, which defines the equivalent protocol for the T and coincident T and S reference points between a user and a public ISDN. Many of the clauses of ETS 300 102-1 are incorporated by reference. Any reference in the text of ETS 300 102-1 to annex D of that document are not applicable to this Standard. Annex F contains information on terminal interchangeability between PTNs and public ISDNs.

This Standard is applicable to basic and primary rate accesses of PTNXs and to TEs that are intended for connection to such accesses.

The conveyance of non-standardized (e.g. manufacturer-specific) information in messages is outside the scope of this Standard. Annex D discusses ways in which this can be achieved.

2 Conformance

In order to conform to this Standard, a PTNX shall satisfy the PTN requirements and a TE shall satisfy the TE requirements identified in the Protocol Implementation Conformance Statement (PICS) Proforma in annex G.

3 References

ECMA-105	Private Telecommunication Networks (PTN) - Signalling at the S Reference Point - Data Link Layer Protocol (SSIG-L2) (1993)
ECMA-155	Addressing in Private Telecommunication Networks (1991)
ETS 300 102-1	Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control (1990)
ETS 300 171	Private Telecommunication Network (PTN); Specification, functional models and information flows; Control aspects of circuit-mode basic services (1992)
ETS 300 189	Private Telecommunication Network (PTN); Addressing (1992)
ENV 41004	Reference configurations for calls through exchanges of private telecommunication networks (1989)
ENV 41005	Method for the specification of basic and supplementary services of private telecommunication networks (1990)
ENV 41007	Definition of terms in private telecommunication networks (1989)
CCITT Rec. I.112	Vocabulary of terms for ISDNs (1988)

4 Definitions

For the purpose of this Standard, the terminology defined in ENV 41007 and CCITT Rec. I.112 applies. If there is conflict, the definitions in ENV 41007 shall take precedence. In addition the following definitions apply.

4.1 Basic call

A single invocation of a basic service according to ETS 300 171.

4.2 Incoming call

A call presented to the TE by the PTN.

4.3 Outgoing call

A call presented to the PTN by the TE.

4.4 User and network

Throughout this Standard, reference is made to clauses in ETS 300 102-1. When applying a clause in ETS 300 102-1 to the TE-PTN interface, the term "user" shall be interpreted as "TE", and the term "network" shall be interpreted as "PTN".

5 Acronyms

CLIP	Calling Line Identification Presentation
COLP	Connected Line Identification Presentation
ISDN	Integrated Services Digital Network
MSI	Manufacturer-Specific Information
PICS	Protocol Implementation Conformance Statement
PTN	Private Telecommunication Network
PTNX	Private Telecommunication Network eXchange
SAP	Service Access Point
TE	Terminal Equipment

6 General principles

This Standard specifies the signalling procedures for establishing, maintaining and clearing a basic circuit-switched call at a PTN user access. These signalling procedures are defined in terms of messages exchanged over a data link connection on the D-channel of a basic or primary rate interface structure. The result of successful basic call establishment is a connection for the purpose of user information transfer. This connection uses a B-channel of a basic or primary rate interface structure.

Throughout this Standard, the term "B-channel" is used to indicate any channel other than the D-channel.

The basic call signalling procedures specified in this Standard apply to circuit mode bearer services, used either on their own or in support of teleservices.

In addition, this Standard includes signalling procedures for layer management, including restart.

6.1 Protocol model

Figure 1 shows the relationship, within the Control Plane, between the layer 3 protocol at the S reference point, the protocol entities in the TE and PTN, and the adjacent layers.

The Protocol Control entity provides services to Call Control. Call Control corresponds to the functional entities identified for the basic call at Stage 2 (see ETS 300 171), i.e. the Call Control functional entity within the PTN (PTNX) and the Call Control Agent functional entity within the TE. Primitives exchanged across the boundary between Call Control and Protocol Control correspond to the information flows exchanged between the Call Control and Call Control Agent functional entities, as identified at Stage 2. Protocol Control provides the mapping between these primitives and the messages transferred across the TE-PTN interface.

In order to transfer messages, Protocol Control uses the services of the Data Link Layer, as available at the Data Link Layer Service Access Point (SAP). The Data Link Layer in turn uses the services of the Physical Layer.

6.2 Services provided to call control

Protocol Control provides services to Call Control whereby Call Control can send information flows to and receive information flows from the peer Call Control. A primitive from Call Control to Protocol Control of type "request" or "response" normally results in the associated information flow being presented to the peer Call Control as a primitive of type "indication" or "confirmation" respectively.

PTN side primitives are as listed in subclause 5.3 of ETS 300 102-2. TE side primitives are as listed in subclause 6.3 of ETS 300 102-2.

NOTE 1

These primitive names differ from the information flow names specified at Stage 2 in ETS 300 171.

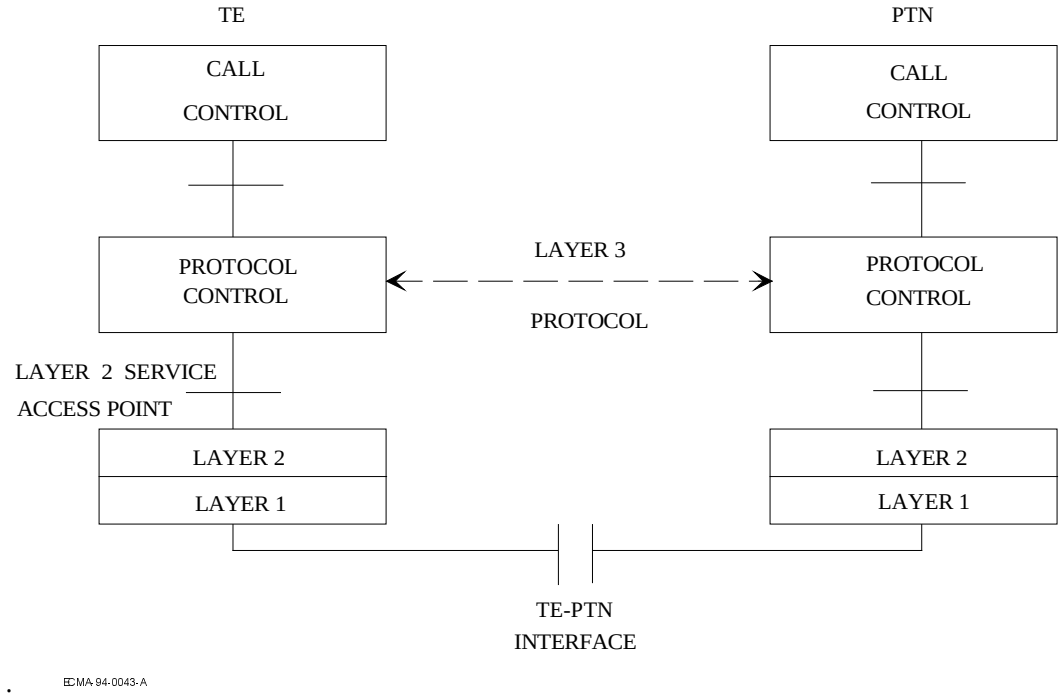


Figure 1 - Protocol model

6.3 Services required of the Data Link Layer

Services provided by the Data Link Layer and the associated primitives are defined in Standard ECMA-105. Protocol Control uses the following services:

6.3.1 Acknowledged information transfer services

- Data Transfer, using the DL-DATA-REQUEST/INDICATION primitives;
- Establishment of Multiple Frame Operation, using the DL-ESTABLISH-REQUEST/INDICATION/CONFIRM primitives;
- Termination of Multiple Frame Operation, using the DL-RELEASE-REQUEST/INDICATION/CONFIRM primitives.

6.3.2 Unacknowledged information transfer services

- Data Transfer, using the DL-UNIT-DATA-REQUEST/INDICATION primitives.

6.4 Protocol control states

Protocol Control procedures for calls and layer management are specified in terms of:

- messages which are transferred across the TE-PTN interface;
- the primitives to and from Call Control at the TE side and the PTN side of the TE-PTN interface;
- the information processing and actions that take place within Protocol Control at the TE side and the PTN side of the TE-PTN interface; and
- the states that can exist within Protocol Control at the TE side and the PTN side of the TE-PTN interface.

State machines are deemed to exist for each circuit mode call. A further state machine is deemed to exist for layer management, covering restart procedures.

6.4.1 States for circuit mode call control

The call states defined in subclause 2.1.1 of ETS 300 102-1 for the user side of the user-network interface apply also to the TE side of the TE-PTN interface.

NOTE 2

If the TE does not support the optional suspend and resume procedures of subclause 8.6, states U15 and U17 will never be entered.

The call states defined in subclause 2.1.2 of ETS 300 102-1 for the network side of the user-network interface apply also to the PTN side of the TE-PTN interface.

NOTE 3

If the PTN does not support the optional suspend and resume procedures of subclause 8.6, states N15 and N17 will never be entered.

6.4.2 States for layer management

The states defined in subclause 2.4.1 of ETS 300 102-1 for use in association with the global call reference at the user side of the user-network interface apply also to the TE side of the TE-PTN interface.

The states defined in subclause 2.4.2 of ETS 300 102-1 for use in association with the global call reference at the network side of the user-network interface apply also to the PTN side of the TE-PTN interface.

6.5 Message segmentation and reassembly functions

Message segmentation and reassembly functions are employed where the size of a message exceeds the maximum size of the Data Link Layer information field size. The architectural relationship of segmentation and reassembly functions to other Protocol Control functions is shown in figure 2.

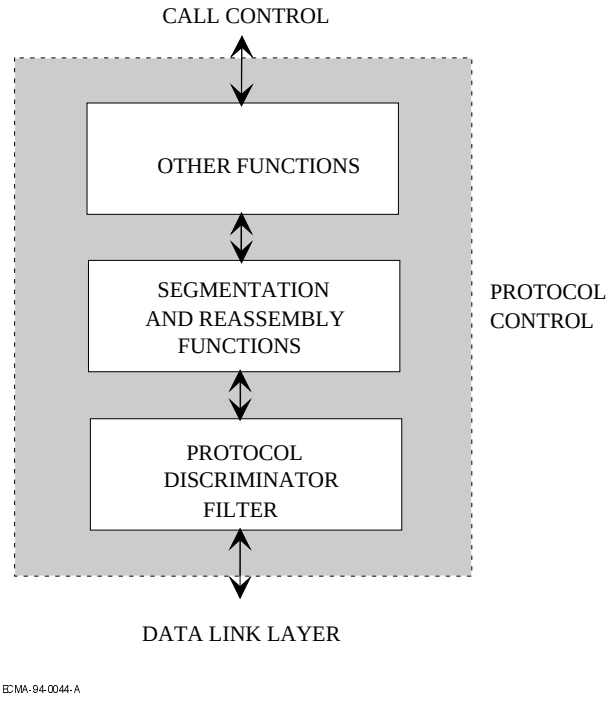


Figure 2 - Logical architecture of Protocol Control showing segmentation and reassembly functions

Segmentation and reassembly, where provided, effectively constitutes a lower sub-layer of Protocol Control. The only function of Protocol Control which lies below the segmentation and reassembly functions is the filtering out of messages containing a protocol discriminator which is not in accordance with that specified.

The primitives across the boundary between segmentation and reassembly functions and other functions are the same as those between the Data Link Layer and Protocol Control. The segmentation functions act upon DL-DATA-REQUEST primitives by converting, where necessary, a single primitive into two or more primitives before passing to the Data Link Layer. The reassembly functions act upon DL-DATA-INDICATION primitives from the Data Link Layer by converting, where necessary, two or more primitives into a single primitive for passing up to the other functions of Protocol Control. Other primitives to and from the Data Link Layer are not affected by the segmentation and reassembly functions.

Message segmentation and reassembly procedures are each specified in terms of a state machine. Message segmentation uses a single state, Null (0). Message reassembly uses two states, as listed below.

6.5.1 Null (0)

No message is being reassembled.

6.5.2 Receiving segmented message (1)

One or more segments of a segmented message have been received and one or more further segments are awaited.

7 General procedures

7.1 Use of the services of Layer 2

7.1.1 Establishment of a Data Link connection

Before the procedures for call control, layer management or any of the general procedures in subclauses 7.2 to 7.4 can be performed, a Data Link connection must be established between the PTN and the TE. The exception is the sending of a SETUP message by the PTN using the unacknowledged information transfer service of the Data Link Layer.

If a Data Link connection has not already been established, Protocol Control can request establishment by sending a DL-ESTABLISH-REQUEST primitive to the Data Link Layer. Receipt of a DL-ESTABLISH-CONFIRMATION primitive or a DL-ESTABLISH-INDICATION primitive from the Data Link Layer indicates that a Data Link connection has been established.

7.1.2 Transfer of data

If a multi-point configuration exists at an interface, or if the PTN does not know whether the configuration is multi-point or point-to-point, a SETUP message sent by the PTN shall use the unacknowledged data transfer service (broadcast Data Link) of the Data Link Layer. A message (or message segment) shall be transmitted by including it within a DL-UNIT-DATA-REQUEST primitive to the Data Link Layer. A received message (or message segment) will appear included with a DL-UNIT-DATA-INDICATION primitive from the Data Link Layer.

All other messages shall use the acknowledged data transfer service of the Data Link Layer (point-to-point Data Link). A message (or message segment) shall be transmitted by including it with a DL-DATA-REQUEST primitive to the Data Link Layer. A received message (or message segment) will appear included within a DL-DATA-INDICATION primitive from the Data Link Layer.

NOTE 4

Before a TE can respond to a SETUP message delivered using the unacknowledged data transfer service, it must establish a Data Link connection according to the procedures of 7.1.1, unless a Data Link connection already exists between the PTN and that TE.

7.2 Message segmentation procedures

This subclause specifies message segmentation and reassembly procedures for messages whose length exceeds the maximum size of the Data Link Layer information field. The maximum Data Link Layer information field size is defined in ETS 300 169 (parameter N201).

A PTN or a TE conforms to the message segmentation procedures if it is capable of transmitting a message which exceeds the maximum size of the Data Link Layer information field. Segmentation procedures shall not be applied to messages which do not exceed the maximum size of the Data Link Layer information field.

A PTN or a TE which claims conformance to this Standard shall declare the maximum size of message which it is able to receive. The declared maximum size shall not be less than 260 octets. If the maximum size of the Data Link Layer information field is less than the declared maximum size of message which can be received, the PTN or TE shall conform to the message reassembly procedures.

The message segmentation and reassembly procedures of annex K of ETS 300 102-1 shall apply, except the requirement in clause K.1.

If a segmented message is received by a PTN or TE which does not support reassembly procedures, the procedures specified in subclause 5.8.4 of ETS 300 102-1 for message type errors shall apply to each received segment.

7.3 Handling of protocol error conditions

The requirements of subclauses 5.8.1 to 5.8.9 of ETS 300 102-1 shall apply with the following clarifications and additions.

7.3.1 Addition to requirements of subclause 5.8.6.1 of ETS 300 102-1

When a RELEASE message which contains no Cause information element is received as a first clearing message, the actions to be taken shall be the same as if a RELEASE message with Cause No. 31 "normal, unspecified" had been received, except that if a RELEASE COMPLETE message is sent, it shall contain Cause No. 96 "mandatory information element is missing".

7.3.2 Addition to requirements of subclause 5.8.6.2 of ETS 300 102-1

When a RELEASE message with invalid content of the Cause information element is received as a first clearing message, the actions to be taken shall be the same as if a RELEASE message with Cause No. 31 "normal, unspecified" had been received, except that if a RELEASE COMPLETE message is sent, it shall contain Cause No. 100 "invalid information element contents".

7.3.3 Modification to subclause 5.8.7.1, second paragraph, of ETS 300 102-1

When the unrecognized information element occurs in a message other than DISCONNECT, RELEASE, or RELEASE COMPLETE, the STATUS message, if sent, shall indicate the call state that the receiving entity enters after processing the message in which the unrecognized information element was received.

7.3.4 Replacement for items a, b and c of subclause 5.8.7.1 of ETS 300 102-1

a) When a DISCONNECT message is received which has one or more unrecognized information elements, the actions taken shall be the same as if a DISCONNECT message had been received without these unrecognized information elements with the exception that the RELEASE message returned shall contain Cause No. 99 "information element non-existent". It is recommended to provide Cause No. 99 with diagnostics, although the inclusion of diagnostics is optional.

b) When a RELEASE message is received which has one or more unrecognized information elements, the actions taken shall be the same as if a RELEASE message had been received without these unrecognized information elements with the exception that the RELEASE COMPLETE message returned shall contain Cause No. 99 "information element non-existent". It is recommended to provide Cause No. 99 with diagnostics, although the inclusion of diagnostics is optional.

c) When a RELEASE COMPLETE message is received which has one or more unrecognized information elements, the actions taken shall be the same as if a RELEASE COMPLETE message without these unrecognized information elements had been received.

7.3.5 Addition to requirements of subclause 5.8.7.2 of ETS 300 102-1

If a DISCONNECT, RELEASE or RELEASE COMPLETE message is received which has one or more non-mandatory information elements with invalid contents, normal call clearing shall apply. The RELEASE and RELEASE COMPLETE messages returned shall contain Cause No. 100 "invalid information element contents". It is recommended to provide Cause No. 100 with diagnostics, although the inclusion of diagnostics is optional.

7.3.6 Modification to subclause 5.8.7.2, first paragraph, of ETS 300 102-1

When the information element with content error occurs in a message other than DISCONNECT, RELEASE, or RELEASE COMPLETE, the STATUS message, if sent, shall indicate the call state that the receiving entity enters after processing the message in which the information element with content error was received.

7.3.7 Modification to subclause 5.8.7.2, second paragraph, of ETS 300 102-1

Access information elements with a length exceeding the maximum length shall be treated as having content error, i.e. they shall not be truncated and processed.

7.4 Handling of configuration errors

In point-to-multipoint configurations at the TE-PTN interface, the PTN capability may be limited by manufacturer declaration. This means that the PTN may accept only a limited number of positive responses to a SETUP message which was delivered using the broadcast data link. If the number of positively responding TEs, as defined by the data link on which an initial responding message (i.e. CALL PROCEEDING, ALERTING or CONNECT) is received, reaches the limit, any additional positive response shall be rejected. Depending on implementation, the

PTN shall either send a RELEASE COMPLETE message containing Cause No. 47 "Resource unavailable, unspecified" or initiate normal call clearing using the same Cause number.

NOTE 5

It is the user's responsibility to configure a basic access in accordance with the particular PTN's limitation.

7.5 Status and status enquiry procedures

The requirements of subclauses 5.8.10 to 5.8.11 of ETS 300 102-1 shall apply with the following amendments.

7.5.1 Modifications to subclause 5.8.10 of ETS 300 102-1

The requirements of the paragraph beginning with "The sending or receipt of the STATUS ENQUIRY message..." shall be modified as follows.

A STATUS message containing Cause No. 97 shall not be treated as a response to the STATUS ENQUIRY message.

7.5.2 Modifications to subclause 5.8.11 of ETS 300 102-1

The requirements of the paragraph beginning with "A STATUS message may be received..." and the paragraph beginning with "In this case the actions..." shall be replaced by the following.

> On receipt of a STATUS message indicating a compatible protocol control state but containing one of the Causes No. 96, No. 97, No. 99, or No. 100, the receiving entity should attempt to analyse the contents of the received STATUS message considering the current stage of the call in order to determine whether or not the call can continue. The actions to be taken are an implementation option.

8 Procedures for circuit mode call control

The call states referred to in this clause cover the states perceived by the PTN, states perceived by the TE and states which are common to both TE and PTN. Unless specifically qualified, all states described in the following text shall be understood as common.

As a general principle, any message sent by the PTN to the TE may contain a Display information element whose contents may be displayed by the TE.

In addition to the messages exchanged as described in the following subclauses, INFORMATION messages for call control may be sent by the TE or by the PTN only after the first response to a SETUP message has been sent or received, and before clearing of the call reference is initiated. An INFORMATION message received in the Release Request state may be ignored.

8.1 Call establishment at the originating interface

The requirements of subclause 5.1 of ETS 300 102-1 shall apply with the following additions and modifications.

8.1.1 Addition to subclause 5.1.1 of ETS 300 102-1

Address information elements shall be handled as specified in ETS 300 189.

8.1.2 Modification to the "ETSI requirement" concerning en-bloc sending in subclause 5.1.1 of ETS 300 102-1

The #-character shall not be used as sending complete indication.

8.1.3 Modification to the "ETSI requirement" concerning the tone option in subclause 5.1.3 of ETS 300 102-1

If the PTN provides dial tone to the TE, the progress description value No. 8 shall be included in the SETUP ACKNOWLEDGE message. The "tone option" should be interpreted as the need to return dial tone in the case where the Bearer capability information element indicates an appropriate Bearer capability, e.g. "3,1 kHz audio" or "speech". The TE may attach to the B-channel on receipt of the SETUP ACKNOWLEDGE message with the Progress description value No. 8.

NOTE 6

The attachment to the B-channel by the TE at this point is recommended, when the network-provided tones or announcements are of use.

8.1.4 Clarification of subclause 5.1.5 of ETS 300 102-1

The indicated Causes in subclause 5.1.5 of ETS 300 102-1 for rejecting a call because the requested service is not authorized or is not available, are only examples. Other Causes are possible in this case.

8.1.5 Modification to subclause 5.1.6 of ETS 300 102-1

The requirements in subclause 5.1.6 of ETS 300 102-1 for receipt of a Progress indicator information element shall be replaced by the following requirement.

> If the Progress indication information element is included in a call control message, the procedures specified in the rest of subclause 5.1 shall apply. If the Progress indicator information element is included in the PROGRESS message, no state change shall occur but supervisory timer T310 shall be stopped if progress description value No. 1, 2 or 8 is included in the PROGRESS message. In both cases the user shall connect to the B-channel (if not already connected) if progress description value No. 1 or 8 is included.

8.1.6 Modification to the "ETSI requirement" concerning the sending of the alerting message in subclause 5.1.7 of ETS 300 102-1

The first "ETSI Requirement" in subclause 5.1.7 of ETS 300 102-1 concerning the sending of the ALERTING message shall be replaced by the following requirement.

> For services which require an in-band tone or announcement to be supplied to the calling TE during the period of alerting, the PTN shall connect the appropriate tone or announcement to the B-channel.

8.1.7 Modification to the "ETSI requirement" concerning the receipt of the alerting message in subclause 5.1.7 of ETS 300 102-1

The second "ETSI Requirement" in subclause 5.1.7 of ETS 300 102-1 concerning the receipt of the ALERTING message shall be replaced by the following requirement.

> When the TE receives the ALERTING message with Progress description value No. 1 or No. 8 of the Progress indicator information element included in the message, the TE may attach to the B-channel (if not attached already). The TE shall attach to the B-channel on receipt of the CONNECT message if not already attached.

8.1.8 Addition to subclause 5.1.8 of ETS 300 102-1

The PTN shall support the transfer of the Low layer compatibility information element transparently in both directions in the SETUP and the CONNECT message if it is provided by the calling TE (using the SETUP message) or by the called TE (using the CONNECT message). The requirements of annex M and of annex L, clauses L.1 and L.2, of ETS 300 102-1 shall apply.

8.1.9 Non-applicability of transit network selection

The transit network selection, described in subclause 5.1.10 of ETS 300 102-1, is outside the scope of this Standard.

8.2 Call establishment at the destination interface

The requirements of subclause 5.2 of ETS 300 102-1 shall apply with the following modifications.

8.2.1 Addition to subclause 5.2.1 of ETS 300 102-1

Address information elements shall be handled as specified in ETS 300 189.

8.2.2 Change to case 4 of subclause 5.2.3.1 of ETS 300 102-1

In case 4 "no B-channel available" of the channel selection procedure, the TE shall be allowed to reject the call by sending a RELEASE COMPLETE message with the Cause No. 34 (free TE) or No. 17 (busy TE). Alternative actions whereby the user employs supplementary services in order to proceed with the call are outside the scope of this Standard.

8.2.3 Change to case b of subclause 5.2.3.2 of ETS 300 102-1

In case b "no B-channel available" of the channel selection procedure, the TE shall be allowed to reject the call by sending a RELEASE COMPLETE message with the Cause No. 34 (free TE) or No. 17 (busy TE). Alternative actions whereby the user employs supplementary services in order to proceed with the call are outside the scope of this Standard.

8.2.4 Non-applicability of overlap receiving procedure

The overlap receiving procedure described in subclauses 5.2.1 and 5.2.4 of ETS 300 102-1 shall not be used, but only the en-bloc receiving procedure. Complete called party number information shall always be sent in the SETUP message.

8.2.5 Replacement of the first paragraph of 5.2.5.2 of ETS 300 102-1

When the SETUP message is delivered on a broadcast data link, the PTN shall maintain a state machine that tracks the overall progression of the incoming call. The PTN shall also maintain an associated call state, up to an implementation-dependent number, for each responding TE as determined by the data link on which a message is received.

8.2.6 Modification to the "ETSI requirement" concerning progress description value No. 1

On receipt of a PROGRESS message with the Progress description value No. 1, the PTN shall stop only supervisory timer T310.

8.2.7 Addition to subclause 5.2.8 of ETS 300 102-1

The PTN shall support the transfer of the Low layer compatibility information element transparently in both directions in the SETUP and the CONNECT message if it is provided by the calling TE (using the SETUP message) or by the called TE (using the CONNECT message). The requirements of annex M and of annex L, clauses L.1 and L.2, of ETS 300 102-1 shall apply.

The PTN shall connect the B-channel in both directions on receipt of the CONNECT message from the called TE. Optionally, and if the SETUP message was delivered on a point-to-point Data Link, through connection may occur in one or both directions at an earlier stage, but not before completion of channel negotiation at the destination interface.

8.3 Call clearing

The requirements of subclause 5.3 of ETS 300 102-1 shall apply with the following amendments.

8.3.1 Replacement of item b of subclause 5.3.2 of ETS 300 102-1

If a SETUP message has been delivered on the broadcast data link, the PTN shall initiate the clearing of a responding TE which is not awarded the call by sending a RELEASE message or, if the PTN is unable to establish a state machine for the TE, by sending a RELEASE COMPLETE message. The RELEASE or RELEASE COMPLETE message shall contain cause No. 26 "non-selected user clearing".

8.3.2 Non-applicability of item c of subclause 5.3.2 of ETS 300 102-1

Subclause 5.3.2 of ETS 300 102-1 item c) shall not apply.

8.3.3 Modification to subclause 5.3.3 of ETS 300 102-1

A second Cause information element shall not be used in a clearing message.

8.3.4 Modification to subclause 5.3.4.1 of ETS 300 102-1

A second Cause information element shall not be used in a clearing message.

8.3.5 Modification to subclause 5.3.4.2 of ETS 300 102-1

A second Cause information element shall not be used in a clearing message.

8.4 In-band tones and announcements

The requirements of subclause 5.4 of ETS 300 102-1 shall apply with the exception of its Note 3.

8.5 Call collisions

The requirements of subclause 5.7 of ETS 300 102-1 shall apply.

8.6 Suspend and resume procedures

These procedures are optional for TEs and for PTNs.

The requirements of subclause 5.6 of ETS 300 102-1 shall apply with the following exceptions.

i. The "ETSI requirement" permitting some networks only to support a maximum length of the Call identity value of two octets shall not apply.

ii. Subclause 5.6.7 shall not apply.

iii. The sending of the NOTIFY message is outside the scope of this Standard.

NOTE 7

The use of these procedures in support of the Terminal Portability supplementary service is outside the scope of this Standard.

8.7 TE-side and PTN-side SDL diagrams

The user-side and network-side Specification and Description Language (SDL) diagrams contained in ETS 300 102-2 may also be used to provide additional clarification of the procedures described in this Standard, except for those aspects which conflict with differences between this Standard and ETS 300 102-1. The differences specified in subclauses 7.4, 7.5, 8.1.5, 8.2.2, 8.2.3, 8.2.4 and 8.3.2 of this Standard are not reflected in the SDL diagrams of ETS 300 102-2.

9 Procedures for layer management

9.1 Restart procedures

The requirements of subclause 5.5 of ETS 300 102-1 shall apply.

ETS 300 102-2 contains (informative) SDL diagrams of the Restart procedures, which may be used to provide additional clarification of these procedures.

10 List of system parameters

The requirements of clause 9 of ETS 300 102-1 shall apply with the following amendments.

i. All TE-side timer values shall have a tolerance of 5%; all PTN-side timer values shall have a tolerance of 10%.

ii. TE-side timer T310 shall have a value in the range 30 s to 120 s.

NOTE 8

It is recommended that, if TE-side timer T310 is implemented, a value near to the upper-end of the range be chosen to avoid problems when routeing is delayed, e.g. while waiting for resources.

iii. Timer T320 and timer T321 are not used.

11 Functional definition and content of messages

The procedures of this Standard make use of the messages listed in table 1 below.

Table 1 - Messages

Call establishment messages: ALERTING CALL PROCEEDING CONNECT CONNECT ACKNOWLEDGE PROGRESS SETUP SETUP ACKNOWLEDGE
Call information phase messages: RESUME RESUME ACKNOWLEDGE RESUME REJECT SUSPEND SUSPEND AKCNOWLEDGE SUSPEND REJECT
Call clearing messages: DISCONNECT RELEASE RELEASE COMPLETE
Layer management messages: RESTART RESTART ACKNOWLEDGE
Miscellaneous messages: INFORMATION STATUS STATUS ENQUIRY

This clause defines each of these messages by means of a reference to the corresponding clause of ETS 300 102-1 which describes the particular message, supplemented by a description of the differences in those cases where this Standard differs from ETS 300 102-1.

Each definition in ETS 300 102-1 includes:

a) A brief description of the direction, significance and use of that message.

Statements in ETS 300 102-1 concerning the significance of a message shall be ignored.

b) A table listing the information elements of codeset 0 in the order of their appearance in the message (same relative order for all message types). For each information element the table indicates:

- the clause of ETS 300 102-1 describing the information element (clause 12 below defines all the information elements used for this Standard);
- the direction in which it may be sent ['n → u', meaning network-to-user (PTN-to-TE); 'u → n', meaning user-to-network (TE-to-PTN) or both];
- whether inclusion is mandatory (M) or optional (O), with a reference to notes explaining the circumstances under which the information element shall be included;
- the length (or length range) of the information element, in octets, where * denotes an undefined maximum length which may be network- or service- dependent.

c) Further explanatory notes, as necessary.

Additional elements in codeset 5 are specified in this Standard. Note, however, that the shift from codeset 0 to codeset 5 is not explicitly shown.

Since this Standard only deals with basic call control, all messages and information elements of ETS 300 102-1 that do not pertain to basic services as defined in ETS 300 171 are excluded from its scope. This means that support of these messages and information elements is not required in order to conform to this Standard.

NOTE 9

Other messages and information elements than those defined here will be required for the support of supplementary services and Additional Network Features (ANFs); these will be defined in other standards.

11.1 Messages for general procedures

11.1.1 STATUS

The requirements of subclause 3.1.18 and of subclause 3.4.3 of ETS 300 102-1 shall apply.

11.1.2 STATUS EQUIRY

The requirements of subclause 3.1.19 of ETS 300 102-1 shall apply.

11.2 Messages for circuit mode call control

11.2.1 ALERTING

The requirements of subclause 3.1.1 of ETS 300 102-1 shall apply, with the following modifications:

- the information elements 'Facility' and 'User-user' are outside the scope of this Standard;
- the last statement of note 2, explaining the use of 'Progress indicator' in the direction 'user to network', shall not apply since annex N is not applicable;
- the following codeset 5 information element may also be included:

Table 2 - Information element of codeset 5

Information Element	Reference	Direction	Type	Length
Party category	12.6	n → u	0	4

11.2.2 CALL PROCEEDING

The requirements of subclause 3.1.2 of ETS 300 102-1 shall apply, with the following exception:

- the last statement of note 3, explaining the use of 'Progress indicator' in the direction 'user to network', shall not apply since annex N is not applicable.

11.2.3 CONNECT

The requirements of subclause 3.1.4 of ETS 300 102-1 shall apply, with the following modifications:

- the information elements 'Facility' and 'User-user' are outside the scope of this Standard;
- the following information elements may also be included:

Table 3 - Additional information elements

Information Element	Reference	Direction	Type	Length
Connected number	12.5	u → n (Notes 10 and 11)	0	4-24
Connected subaddress	12.5	u → n (Note 10)	0	4-23
Party category	12.6	n → u	0	4

NOTE 10

Inclusion in the direction user-to-network shall be in accordance with the provisions of ETS 300 189. Inclusion in the direction network-to-user is part of the supplementary service COLP.

NOTE 11

Information element Connected number is relevant only in the context of a multiple subscriber number arrangement at the access.

11.2.4 CONNECT ACKNOWLEDGE

The requirements of subclause 3.1.5 of ETS 300 102-1 shall apply.

11.2.5 DISCONNECT

The requirements of subclause 3.1.6 of ETS 300 102-1 shall apply, with the following exception:

– the information elements 'Facility' and 'User-user' are outside the scope of this Standard.

11.2.6 INFORMATION

The requirements of subclause 3.1.8 of ETS 300 102-1 shall apply, with the following exceptions:

– the information element 'Keypad facility' is outside the scope of this Standard;

– the network option 'Inclusion of the 'Cause' information element' shall not apply.

11.2.7 PROGRESS

The requirements of subclause 3.1.10 of ETS 300 102-1 shall apply, with the following exception:

– the information element 'User-user' is outside the scope of this Standard.

11.2.8 RELEASE

The requirements of subclause 3.1.11 of ETS 300 102-1 shall apply, with the following exception:

– the information elements 'Facility' and 'User-user' are outside the scope of this Standard.

11.2.9 RELEASE COMPLETE

The requirements of subclause 3.1.12 of ETS 300 102-1 shall apply, with the following exception:

– the information elements 'Facility' and 'User-user' are outside the scope of this Standard.

11.2.10 RESUME

The requirements of subclause 3.1.13 of ETS 300 102-1 shall apply.

11.2.11 RESUME ACKNOWLEDGE

The requirements of subclause 3.1.14 of ETS 300 102-1 shall apply.

11.2.12 RESUME REJECT

The requirements of subclause 3.1.15 of ETS 300 102-1 shall apply.

11.2.13 SETUP

The requirements of subclause 3.1.16 of ETS 300 102-1 shall apply, with the following modifications:

– The information elements 'Facility', 'Keypad facility', 'Network specific facilities', 'Transit network selection' and 'User-user' are outside the scope of this Standard.

– The information element 'Progress indicator' shall be used only to indicate interworking.

– The information elements 'Calling party number' and 'Calling party subaddress' may optionally be included in the direction user-to-network, in accordance with the provisions of ETS 300 189. Information element Calling party number is relevant only in the context of a multiple subscriber number arrangement at the access.

NOTE 12

Inclusion in the direction network-to-user is part of the supplementary service CLIP.

– The following codeset 5 information element may also be included:

Table 4 - Additional information element of codeset 5

Information Element	Reference	Direction	Type	Length
Party category	12.6	n → u	0	4

11.2.14 SETUP ACKNOWLEDGE

The requirements of subclause 3.1.17 of ETS 300 102-1 shall apply.

11.2.15 SUSPEND

The requirements of subclause 3.1.20 of ETS 300 102-1 shall apply.

11.2.16 SUSPEND ACKNOWLEDGE

The requirements of subclause 3.1.21 of ETS 300 102-1 shall apply.

11.2.17 SUSPEND REJECT

The requirements of subclause 3.1.22 of ETS 300 102-1 shall apply.

11.3 Messages for layer management

11.3.1 RESTART

The requirements of subclause 3.4.1 of ETS 300 102-1 shall apply.

11.3.2 RESTART ACKNOWLEDGE

The requirements of subclause 3.4.2 of ETS 300 102-1 shall apply.

12 General message format and coding of information elements

This clause defines the format of messages and the coding of information elements, respectively, by means of references to the corresponding clauses of ETS 300 102-1, supplemented by a description of the differences in those cases where this Standard differs from ETS 300 102-1.

Order of transmission:

ETS 300 102-1 describes the structure of information elements in the form of figures and tables. Within each octet, the bit designated "bit 1" shall be transmitted first, followed by bits 2, 3, 4 etc. Similarly, the octet shown at the top of each figure shall be sent first.

12.1 Overview

The requirements of subclause 4.1 of ETS 300 102-1 shall apply.

12.2 Protocol discriminator

The requirements of subclause 4.2 of ETS 300 102-1 shall apply.

12.3 Call reference

The requirements of subclause 4.3 of ETS 300 102-1 shall apply, with the following qualification:

– the dummy call reference is outside the scope of this Standard, but may be required for other standards.

12.4 Message type

The requirements of subclause 4.4 of ETS 300 102-1 shall apply, with the following modification:

– table 4.2 of ETS 300 102-1 shall be replaced by the following table.

Table 5 - Messages Types

8	7	6	5	4	3	2	1	
0	0	0						Call establishment messages:
			0	0	0	0	1	ALERTING
			0	0	0	1	0	CALL PROCEEDING
			0	0	1	1	1	CONNECT
			0	1	1	1	1	CONNECT ACKNOWLEDGE
			0	0	0	1	1	PROGRESS
			0	0	1	0	1	SETUP
			0	1	1	0	1	SETUP ACKNOWLEDGE
0	0	1						Call information phase messages:
			0	0	1	1	0	RESUME
			0	1	1	1	0	RESUME ACKNOWLEDGE
			0	0	0	1	0	RESUME REJECT
			0	0	1	0	1	SUSPEND
			0	1	1	0	1	SUSPEND ACKNOWLEDGE
			0	0	0	0	1	SUSPEND REJECT
0	1	0						Call clearing and Layer management messages:
			0	0	1	0	1	DISCONNECT
			0	1	1	0	1	RELEASE
			1	1	0	1	0	RELEASE COMPLETE
			0	0	1	1	0	RESTART
			0	1	1	1	0	RESTART ACKNOWLEDGE
0	1	1						Miscellaneous messages:
			0	0	0	0	0	SEGMENT
			1	1	0	1	1	INFORMATION
			1	1	1	0	1	STATUS
			1	0	1	0	1	STATUS ENQUIRY

All other settings are reserved.

12.5 Other information elements (Codeset 0)

12.5.1 Coding rules

The requirements of subclause 4.5.1 of ETS 300 102-1 shall apply, with the following modifications:

- the requirements of subclause 4.5.1.1 shall not apply: table 4.3 of ETS 300 102-1 shall be replaced by the following table 6, which specifies the information elements of codeset 0 used in this Standard;
- the requirements of subclause 4.5.1.2 of ETS 300 102-1 (specifying the use of codeset 5) shall not apply; see 12.6 of this Standard for a definition of codeset 5 elements.

Table 6 - Coding of the information element identifier coding (Codeset 0)

Coding									Reference	Max. Length (octets) (Note 13)
8	7	6	5	4	3	2	1			
1	:	:	:	-	-	-	-	Single-octet information elements:		
	0	0	0	-	-	-	-	Reserved		
	0	0	1	-	-	-	-	Shift	12.5.3	1
	0	1	0	0	0	0	1	Sending complete	12.5.23	1
0	:	:	:	:	:	:	:	Variable-length information elements:		
	0	0	0	0	0	0	0	Segmented message	12.5.22	4
	0	0	0	0	1	0	0	Bearer capability	12.5.5	13
	0	0	0	1	0	0	0	Cause	12.5.12	32
	0	0	1	0	0	0	0	Call identity	12.5.6	10
	0	0	1	0	1	0	0	Call state	12.5.7	3
	0	0	1	1	0	0	0	Channel identification	12.5.13	Note 14
	0	0	1	1	1	1	0	Progress indicator	12.5.20	4
	0	1	0	1	0	0	0	Display	12.5.17	34
	0	1	0	1	0	0	1	Date/Time	12.5.16	8
	1	0	0	1	1	0	0	Connected number	12.5.14	24
	1	0	0	1	1	0	1	Connected subaddress	12.5.15	23
	1	1	0	1	1	0	0	Calling party number	12.5.10	24
	1	1	0	1	1	0	1	Calling party subaddress	12.5.11	23
	1	1	1	0	0	0	0	Called party number	12.5.8	23
	1	1	1	0	0	0	1	Called party subaddress	12.5.9	23
	1	1	1	1	0	0	1	Restart indicator	12.5.21	3
	1	1	1	1	1	0	0	Low Layer compatibility	12.5.19	16
	1	1	1	1	1	0	1	High Layer compatibility	12.5.18	5

All other settings are reserved.

NOTE 13

The length limits for the variable-length information elements take into account only the present CCITT standardized coding values. Future enhancements and expansions to this Standard will not be restricted to these limits.

NOTE 14

The maximum length is network-dependent.

NOTE 15

The reserved values with bits 5 to 8 set to "0000" are for future information elements for which comprehension by the receiver is required.

12.5.2 Extensions of codesets

The requirements of subclause 4.5.2 of ETS 300 102-1 shall apply, with the following modifications:

– codeset 5 is used for information elements defined by ETSI for PTN use;

– codeset 6: the terms 'national network' and 'national or international boundary' shall be replaced by 'local network' and 'local network boundary' respectively in the text concerning codeset 6.

12.5.3 Locking shift procedure

The requirements of subclause 4.5.3 of ETS 300 102-1 shall apply, with the following modifications to table 4.4:

– codeset 5: information elements defined by ETSI for PTN use;

– replace 'national' by 'local' in the text concerning codeset 6.

12.5.4 Non-locking shift procedure

The requirements of subclause 4.5.4 of ETS 300 102-1 shall apply, with the following modifications to table 4.5:

– codeset 5: information elements defined by ETSI for PTN use;

– replace 'national' by 'local' in the text concerning codeset 6.

12.5.5 Bearer capability

The requirements of subclause 4.5.5 of ETS 300 102-1 shall apply, with the following exceptions:

– the information transfer capability 'restricted digital information' shall only apply in interworking cases;

– the requirements prohibiting the use of rate adaption according to CCITT Rec. V.120 ("ETSI Note" in user information layer 1 protocol) shall not apply;

– only the codings applicable to services defined in ETS 300 171 shall be used.

NOTE 16

ETR 018 gives guidance on the combinations of code values applicable to the different basic services.

12.5.6 Call identity

The requirements of subclause 4.5.6 of ETS 300 102-1 shall apply.

12.5.7 Call state

The requirements of subclause 4.5.7 of ETS 300 102-1 shall apply.

12.5.8 Called party number

The requirements of subclause 4.5.8 of ETS 300 102-1 shall apply, with the following modifications:

– type of number (octet 3): the coding specified in ETS 300 102-1 applies only to numbers from the CCITT Rec. E.163/164 Numbering Plan;

– for a Private Numbering Plan according to ETS 300 189 (Numbering Plan identification = Private Numbering Plan) the following coding shall apply:

Table 7 - Coding of a Private Numbering Plan

Bits	7	6	5	Meaning
	0	0	0	Unknown
	0	0	1	Level 2 regional number
	0	1	0	Level 1 regional number
	0	1	1	PTN-specific number
	1	0	0	Local number
	1	0	1	Reserved
	1	1	0	Abbreviated number
	1	1	1	Reserved

12.5.9 Called party subaddress

The requirements of subclause 4.5.9 of ETS 300 102-1 shall apply.

12.5.10 Calling party number

The requirements of subclause 4.5.10 of ETS 300 102-1 shall apply, with the modifications from subclause 12.5.8 above.

12.5.11 Calling party subaddress

The requirements of subclause 4.5.11 of ETS 300 102-1 shall apply.

12.5.12 Cause

The requirements of subclause 4.5.12 of ETS 300 102-1 shall apply, with the following qualifications:

– the Cause information element shall not appear more than once in a message;

– all values in the range 1 to 127 shall be accepted as valid cause values;

– any suitable cause value may be chosen from ETS 300 102-1, table 4.13, except where the procedures of this Standard explicitly specify certain cause values, in which case those values shall be used;

– ETSI-specific cause values, encoded using coding standard '10', shall not apply.

NOTE 17

Refer to annex B for information on the use of cause values.

12.5.13 Channel identification

The requirements of subclause 4.5.13 of ETS 300 102-1 shall apply, with the following restrictions:

– channel type (octet 3.2): only the value 'B-channel units' shall be used (bits 4 to 1 set to 0011);

– Note 4 of ETS 300 102-1 figure 4.20 (optional repetition of octet 3.3) shall not apply.

NOTE 18

Refer to annex H of ETS 300 102-1 for examples of the encoding of the Channel identification information element.

12.5.14 Connected number

The purpose of the Connected number information element is to indicate which number is connected to a call. The connected number may be different from the called party number because of changes (e.g. call redirection, transfer) during the lifetime of the call.

The Connected number information element is coded as shown in figure 3. The coding of octets 3, 3a and 4 shall follow the rules of subclause 4.5.10 of ETS 300 102-1, with the modifications from subclause 12.5.8 above.

8	7	6	5	4	3	2	1	
0	Connected number information element identifier 1	0	0	1	1	0	0	Octet 1
Length of connected number information								Octet 2
0/1 ext	Type of number			Numbering plan identification				Octet 3
1 ext	Presentation Indicator		0	0 spare	0	Screening Indicator		Octet 3a*)
0 spare	Number digits							Octet 4 (repeated)

* This octet is optional

Figure 3 - Connected number information element

12.5.15 Connected subaddress

The purpose of the Connected subaddress information element is to identify the subaddress of the connected party of a call. The Connected subaddress may be different from the called party subaddress because of changes (e.g. call redirections, transfer) during the lifetime of the call.

The Connected subaddress information element is coded as shown in figure 4. The coding of octets 3, 4, etc. shall follow the rules of subclause 4.5.11 of ETS 300 102-1.

The maximum length of this information element is 23 octets.

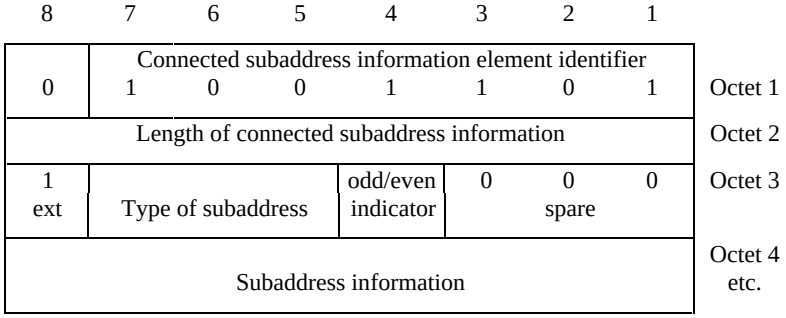


Figure 4 - Connected subaddress information element

12.5.16 Date / time

The requirements of subclause 4.6.1 of ETS 300 102-1 shall apply.

12.5.17 Display

The requirements of subclause 4.5.15 of ETS 300 102-1 shall apply.

12.5.18 High layer compatibility (Layers 4 - 7)

The requirements of subclause 4.5.16 of ETS 300 102-1 shall apply.

NOTE 19

ETR 018 gives guidance on the combinations of code values applicable to the different basic services.

12.5.19 Low layer compatibility (Layers 1 - 3)

The requirements of subclause 4.5.18 of ETS 300 102-1 shall apply.

NOTE 20

ETR 018 gives guidance on the combinations of code values applicable to the different basic services.

12.5.20 Progress indicator

The requirements of subclause 4.5.22 of ETS 300 102-1 shall apply, with the following modifications:

– this information element may appear up to three times in a message, in ascending order according to progress description values.

– Progress description (octet 4):

1. Coding standard (octet 3) = 00 (CCITT-standardized coding): the requirements of sub-clause 4.5.22 of ETS 300 102-1 shall apply.

2. Coding standard (octet 3) = 01 (other international standards):

Bits	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**No**	**Meaning**
	0	0	1	0	0	0	0	16	Interworking with a public network
	0	0	1	0	1	0	0	20	Interworking with another private network

All other settings are reserved.

NOTE 21

Refer to annex A for information on the use of progress indicators.

12.5.21 Restart indicator

The requirements of subclause 4.5.24 of ETS 300 102-1 shall apply.

12.5.22 Segmented message

The requirements of subclause 4.5.25 of ETS 300 102-1 shall apply.

12.5.23 Sending complete

The requirements of subclause 4.5.26 of ETS 300 102-1 shall apply.

12.6 Information elements of codeset 5

Codeset 5 contains information elements defined by ETSI, in addition to those specified in CCITT Rec. Q.931.

In general, the coding rules defined for codeset 0 apply also to codeset 5.

Table 8 lists the information element identifiers for information elements of codeset 5 which are used for this Standard.

Table 8 - Information element identifier coding (Codeset 5)

Coding									Reference	Length
8	7	6	5	4	3	2	1			
1	:	:	:	-	-	-	-	Single-octet information elements:		
	0	0	0	-	-	-	-	reserved	-	-
	0	0	1	-	-	-	-	Shift	12.5.3	1
0	:	:	:	:	:	:	:	Variable-length information elements:		
	0	1	1	0	0	1	0	Party category	12.6.1	3

All other settings are reserved.

12.6.1 Party category

The purpose of this information element is to indicate the category of a party involved in a call.

The Party category information element is coded as shown in figure 5.

8	7	6	5	4	3	2	1		
	Party category information element identifier								
0	0	1	1	0	0	1	0		Octet 1
Length of party category information									Octet 2
1	0	0	0	0	party category				Octet 3
ext	reserved				0	0	0	unknown	
					0	0	1	extension	
					0	1	0	operator	
					0	1	1	emergency extension	

All other settings are reserved.

Figure 5 - Party category information element

Annex A
(informative)

Use of progress indicators

Progress description 1 indicates that interworking with a non-ISDN has occured within the network or networks which the call has traversed.

Progress description 2 indicates that the destination TE is non-ISDN equipment.

Progress description 3 indicates that the origination TE is non-ISDN equipment.

Progress description 4 indicates that a call which had left the ISDN has returned at the same point it had left due to redirection within the non-ISDN. This progress indicator would be employed if a progress indicator No. 1 "call is not end-to-end ISDN" had been delivered to the calling user before.

The use of progress description 8 is described in clause 8.

Progress description 16 indicates that the call comes from or goes to the public ISDN.

Progress description 20 indicates that the call comes from or goes to a private network other than the local PTN.

Annex B
(informative)

Use of cause values

B.1 Definition of cause values

For a definition of cause values, refer to ETS 300 102-1 annex G.

B.2 Use of causes for busy conditions

Based on the scenario of figure B.1 with an assumed call establishment attempt from 'A' towards 'D', table B.1 below summarizes how causes No. 17 "user busy", 34 "no channel available" and 44 "requested channel not available" are to be used. Busy conditions encountered elsewhere along the call path are outside the scope of this Standard (they are for instance dealt with by QSIG procedures).

For the case of interworking with a public ISDN, refer to ETS 300 102-1 annex J.

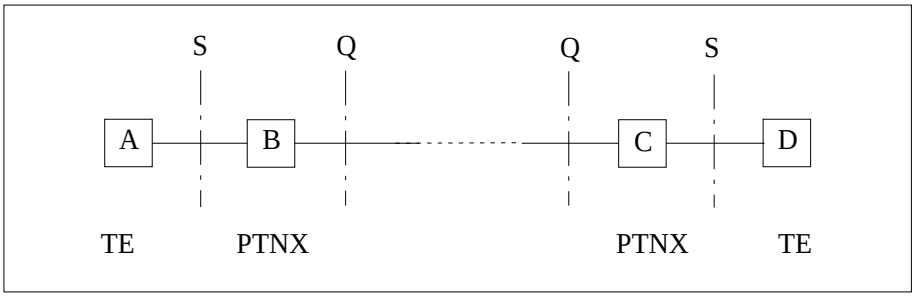


Figure B.1 - Scenario for busy cases

Table B.1 - Cause and location values for busy conditions

Location of Busy	Cause value	Original location	Location reported to user A
B incoming side	34 or 44	local PTN	local PTN
B outgoing side	34 or 44	local PTN	local PTN
C outgoing side	17	local PTN	remote PTN or local PTN
D incoming side	34 or 44	user	user
D call control	17	user	user

Annex C
(informative)

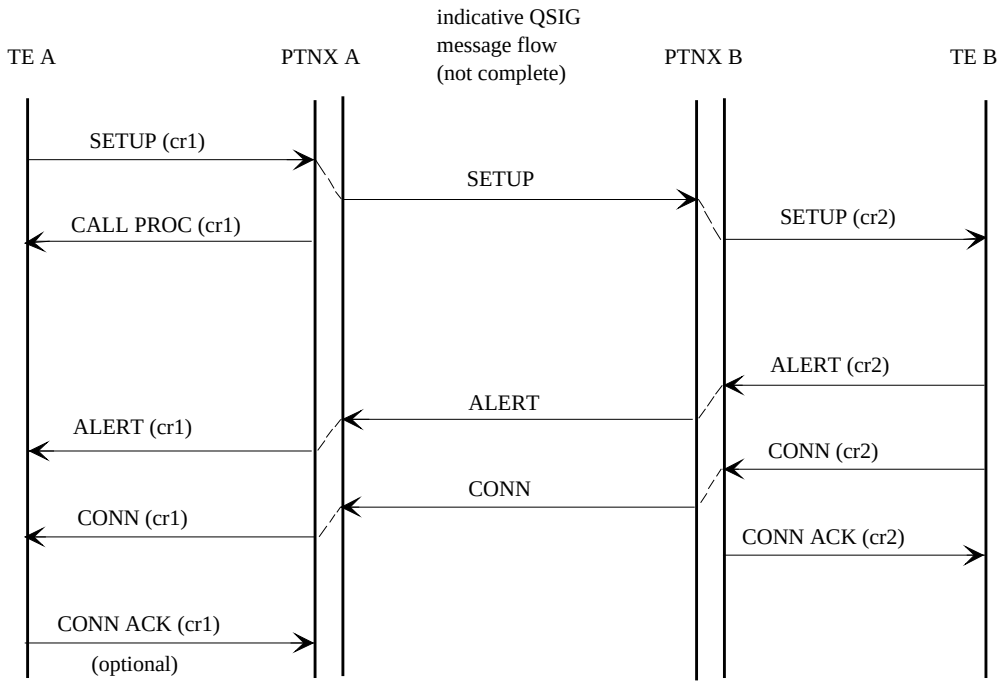
Examples of message sequences

The inter-PTNX signalling is not shown in detail in the following examples.

C.1 En-bloc sending

C.1.1 Successful call setup

Figure C.1 shows an example of the message sequences across the user-network interfaces at A and at B when a call is initiated from TE A to TE B (which is free) and the called party number in the SETUP message to PTNX A is complete.



cr1, cr2 ... Call references

ECMA-94-0046-A

Figure C.1 - En-bloc sending, successful call

C.1.2 Unsuccessful call setup

Figure C.2 shows an example of the message sequences across the user-network interfaces at A and at B when a call is initiated from TE A to TE B (which is busy) and the called party number in the SETUP message to PTNX A is complete.

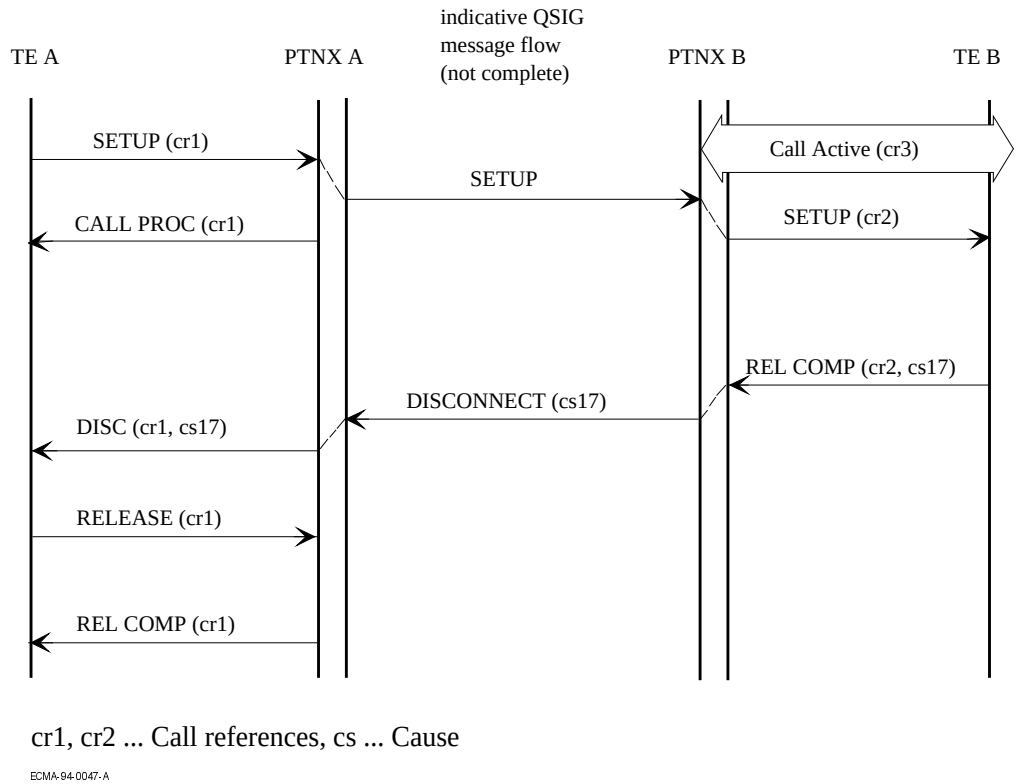
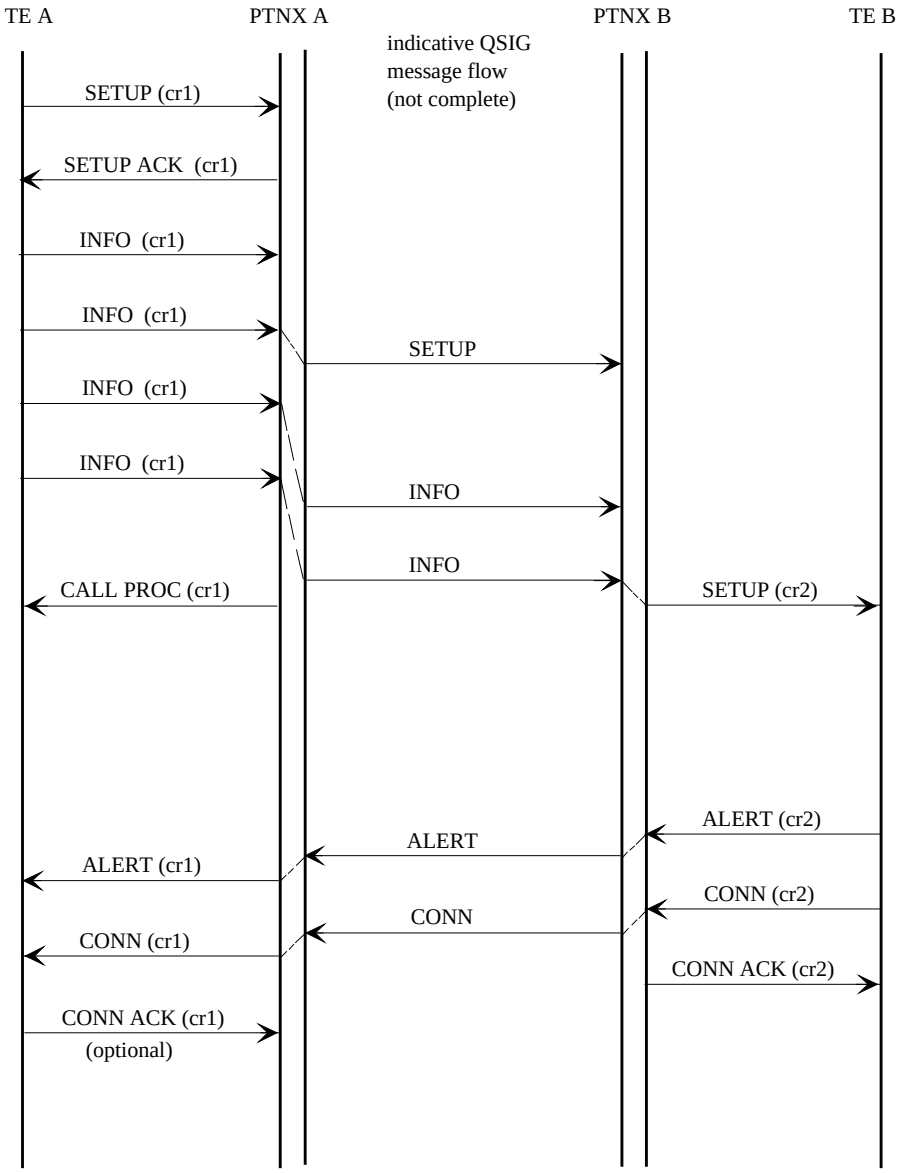


Figure C.2 - En-bloc sending, unsuccessful call

C.2 Overlap sending

C.2.1 Successful call setup

Figure C.3 shows an example of the message sequences across the user-network interfaces at A and at B when a call is initiated from TE A to TE B (which is free) and the called party number in the SETUP message to PTNX A is not complete.



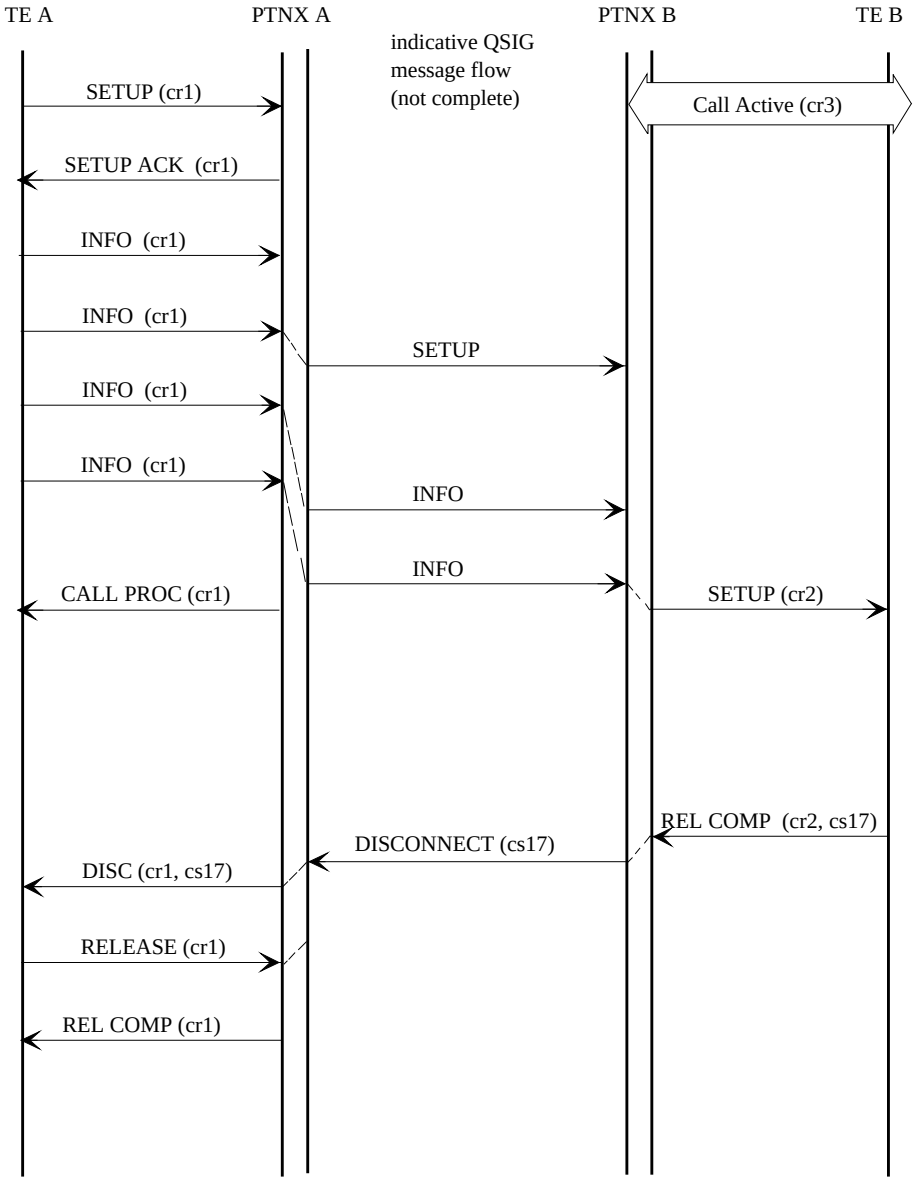
cr1, cr2 ... Call references

ECMA-94-0048-A

Figure C.3 - Overlap sending, successful call

C.2.2 Unsuccessful call setup

Figure C.4 shows an example of the message sequences across the user-network interfaces at A and at B when a call is initiated from TE A to TE B (which is busy) and the called party number in the SETUP message to PTNX A is not complete.



cr1, cr2 ... Call references, cs ... Cause

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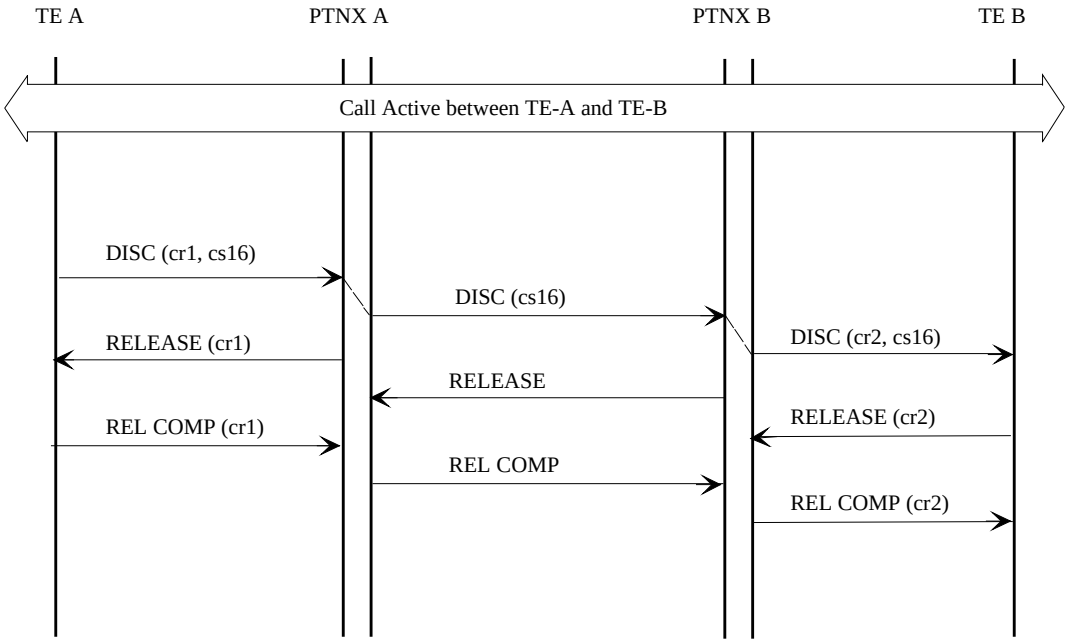
Figure C.4 - Overlap sending, unsuccessful call

C.3 Call clearing

Figure C.5 shows an example of normal call clearing from the active state, initiated by TE A.



cr1, cr2 ... Call references, cs ... Cause

ECMA-94-0051-A

Figure C.5 - Normal call clearing

Annex D
(informative)

Manufacturer-specific information

This Standard permits the inclusion in messages of non-standardized information which is specific to a particular manufacturer, a particular design of equipment, a particular network, etc.. This information is known as Manufacturer-Specific Information (MSI).

The exchange of MSI across a user-network interface may be achieved by means of information elements of codeset 6 or 7. The error procedures of subclause 7.3 will apply in the event of an information element being received and not recognized by a terminal or PTNX. Note that ambiguity may arise when two items of equipment use the same information element identifier for different purposes.

A general purpose method of conveying MSI is by means of the Facility information element specified for supplementary services in another standard. This provides a transparent means of conveying information between a terminal and a PTNX which is not necessarily the terminal's local PTNX. It uses internationally-recognized Object Identifiers to avoid ambiguity.

Annex E
(informative)

Bibliography

ETS 300 102-2	Integrated Services Digital Network (ISDN); User-network interface layer 3, Specifications for basic call control, Specification Description Language (SDL) diagrams (1990).
ETS 300 055	Integrated Services Digital Network (ISDN); Terminal Portability (TP) supplementary service, Digital Subscriber Signalling System No. 1 (DSS1) protocol (1991).
ETR 018	Integrated Services Digital Network (ISDN); Application of the BC-, HLC-, LLC-information elements by terminals supporting ISDN services.

Annex F
(informative)

Terminal interchangeability

Terminals can be designed that will be compatible with both public ISDNs offering interfaces conforming to ETS 300 102-1 and PTNs offering interfaces conforming to this Standard.

Annex G
(normative)

Protocol Implementation Conformance Statement (PICS) Proforma

G.1 Introduction

The supplier of a protocol implementation which is claimed to conform to this Standard shall complete one of the following Protocol Implementation Conformance Statement (PICS) proformas. The PICS proforma in G.3 is for a PTNX. The PICS proforma in G.4 is for a TE.

A completed PICS proforma is the PICS for the implementation in question. The PICS is a statement of which capabilities and options of the protocol have been implemented. The PICS can have a number of uses, including use:

– by the protocol implementor, as a check list to reduce the risk of failure to conform to the Standard through oversight;

– by the supplier and acquirer (or potential acquirer) of the implementation, as a detailed indication of the capabilities of the implementation, stated relative to the common basis for understanding provided by the Standard PICS proforma;

– by the user (or potential user) of the implementation, as a basis for initially checking the possibility of interworking with another implementation (note that, while interworking cannot be guaranteed, failure to interwork can often be predicted from incompatible PICS);

– by a protocol tester, as the basis for selecting appropriate tests against which to assess the claim for conformance of the implementation.

G.2 Instructions for completing the PICS proforma

G.2.1 General structure of the PICS proforma

The PICS proforma is a fixed-format questionnaire divided into subclauses each containing a group of individual items. Each item is identified by an item number, the name of the item (question to be answered), and the reference(s) to the clause(s) specifying the item in the main body of this Standard.

The "Status" column indicates whether an item is applicable, and if so whether support is mandatory or optional. The following terms are used:

m	mandatory (the capability is required for conformance to this Standard);
o	optional (the capability is not required for conformance to this Standard, but if the capability is implemented then it is required to conform to the protocol specifications);
o.<n>	optional, but support of at least one of the group of options labelled by the same numeral <n> is required;
x	prohibited;
c.<cond>	conditional requirement, depending on support for the item or items listed in condition <cond>;
<item>:m	simple-conditional requirement, the capability being mandatory if item number <item> is supported, otherwise not applicable;
<item>:o	simple-conditional requirement, the capability being optional if item number <item> is supported, otherwise not applicable.

Answers to the questionnaire items are to be provided in the "Support" column, by simply marking an answer to indicate a restricted choice (Yes or No), or in the "Not Applicable" column (N/A).

G.2.2 Additional information

Items of additional information allow a supplier to provide further information intended to assist the interpretation of the PICS. It is not intented or expected that a large quantity will be supplied, and a PICS can be considered complete without any such information. Examples might be an outline of the ways in which a (single) implementation can be set up to operate in a variety of environments and configurations.

References to items of additional information may be entered next to any answer in the questionnaire, and may be included in items of exception information.

G.2.3 Exception information

It may occasionally happen that a supplier will wish to answer an item with mandatory or prohibited status (after any conditions have been applied) in a way that conflicts with the indicated requirements. No pre-printed answer will be found in the Support column for this. Instead, the supplier is required to write into the support column an x.<i> reference to an item of exception information, and to provide the appropriate rationale in the exception item itself.

An implementation for which an exception item is required in this way does not conform to this Standard. A possible reason for the situation described above is that a defect in the Standard has been reported, a correction for which is expected to change the requirement not met by the implementation.

G.3 PICS proforma for ECMA-106 PTNX implementation

G.3.1 Implementation identification

Supplier	
Contact point for queries about the PICS	
Implementation Name(s) and Version(s)	
Other information necessary for full identification, e.g. name(s) and version(s) for machines and/or operating systems; system name(s)	

Only the first three items are required for all implementations; other information may be completed as appropriate in meeting the requirement for full identification.

The terms "Name" and "Version" should be interpreted appropriately to correspond with a supplier's terminology (e.g. Type, Series, Model).

G.3.2 Protocol summary

Protocol version	3rd Edition
Addenda implemented	
Amendments implemented	
Have any exception items been required?	No [ ] Yes [ ] (The answer "Yes" means that the implementation does not conform to this Standard)

Date of Statement	

G.3.3 Major capabilities

Item	Questions/feature	Reference	Status	N/A	Support
Z1	Support of the 64 kbps unrestricted bearer	12.5.5	o.1		Yes [ ] No [ ]
Z2	Support of the 64 kbps bearer with speech transfer capability	12.5.5	o.1		Yes [ ] No [ ]
Z3	Support of the 64 kbps bearer with 3.1 khz audio transfer capability	12.5.5	o.1		Yes [ ] No [ ]
Z4	Support of point-to-point configuration for basic access		o.2		Yes [ ] No [ ]
Z5	Support of multipoint configuration for basic access		o.2		Yes [ ] No [ ]
Z6	Support of primary rate access		o.2		Yes [ ] No [ ]

G.3.4 General procedures

G.3.4.1 Use of the services of Layer 2

Item	Questions/feature	Reference	Status	N/A	Support
A1	Establishment of a data link connection	7.1.1	m		Yes [ ]
A2	Transfer of data	7.1.2	m		Yes [ ]

G.3.4.2 Message segmentation procedures

Item	Questions/feature	Reference	Status	N/A	Support
A3	Maximum message size generated	7.2	m		Size [ ]
A4	Maximum message size received	7.2	m		Size [ ]
A5	Length of data link information field generated < Maximum message size generated	7.2	o		Yes [ ] No [ ]
A6	Length of data link information field received < Maximum message size received	7.2	o		Yes [ ] No [ ]
A7	Procedures for message segmentation	7.2	c.1		m: Yes [ ] x: No [ ]
A8	Procedures for message reassembly	7.2	A6:m	[ ]	m: Yes [ ]

c.1 If A5, then mandatory
else, prohibited

G.3.4.3 Handling of protocol error conditions

Item	Questions/feature	Reference	Status	N/A	Support
A9	Treatment of protocol discriminator error	7.3	m		Yes [ ]
A10	Treatment of too short message	7.3	m		Yes [ ]
A11	Treatment of call reference errors	7.3	m		Yes [ ]
A12	Treatment of message type or message sequence errors	7.3	m		Yes [ ]
A13	Treatment of general information element errors	7.3	m		Yes [ ]
A14	Treatment of mandatory information element errors	7.3	m		Yes [ ]
A15	Treatment of non-mandatory information element errors	7.3	m		Yes [ ]
A16	Treatment of data link reset	7.3	m		Yes [ ]
A17	Treatment of data link failure	7.3	m		Yes [ ]

G.3.4.4 Handling of a multipoint configuration

Item	Questions/feature	Reference	Status	N/A	Support
A18	Limit of positive responses to a SETUP message in a multipoint configuration	7.4	Z5:o	[ ]	o: Yes [ ] No [ ] Limit [ ]
A19	Number of maintained state machines that track the overall progression of an incoming call on a broadcast data link	7.4	Z5:m	[ ]	m: Yes [ ] Number [ ]
A20	Procedure for positive responses exceeding the limit of PTN capabilities	7.4	A18:m	[ ]	m: Yes [ ]

G.3.4.5 Status and status enquiry

Item	Questions/feature	Reference	Status	N/A	Support
A21	Receipt of a STATUS ENQUIRY message	7.5	m		Yes [ ]
A22	Sending of a STATUS ENQUIRY message	7.5	o		Yes [ ] No [ ]
A23	Receipt of a solicited STATUS message	7.5	A22:m	[ ]	m: Yes [ ]
A24	Receipt of an unsolicited STATUS message	7.5	m		Yes [ ]

G.3.5 Messages and information elements for general procedures

Item	Questions/feature	Reference	Status	N/A	Support
B1	Receipt of the messages in accordance with the procedures supported and receipt of all the permitted information elements in those messages	11	m		Yes [ ]
B2	Sending of messages, including for each message those information elements marked as mandatory for that message, in accordance with procedures supported	11	m		Yes [ ]
B3	Sending of the Channel identification information element in a SETUP ACKNOWLEDGE, CALL PROCEEDING, ALERTING or CONNECT message when that message is a first response to a SETUP message	11	m		Yes [ ]
B4	Sending of a Progress indicator information element in an ALERTING message in connection with the provision of in-band information/patterns	11.2.1	o		Yes [ ] No [ ]
B5	Sending of a Party category information element in an ALERTING message	11.2.1	o		Yes [ ] No [ ]
B6	Sending of a Progress indicator information element in a CALL PROCEEDING message in connection with the provision of in-band information/patterns	11.2.2	o		Yes [ ] No [ ]
B7	Sending of a Progress indicator information element in a CONNECT message in connection with the provision of in-band information/patterns	11.2.3	o		Yes [ ] No [ ]
B8	Sending of a Low layer compatibility information element in a CONNECT message	11.2.3	o		Yes [ ] No [ ]
B9	Sending of a Party category information element in a CONNECT message	11.2.3	o		Yes [ ] No [ ]
B10	Sending of Date/Time information element in a CONNECT message	11.2.3	o		Yes [ ] No [ ]
B11	Sending of a Progress indicator information element in a DISCONNECT message in connection with the provision of in-band information/patterns	11.2.5	o		Yes [ ] No [ ]
B12	Sending of a Cause information element in a PROGRESS message	11.2.7	o		Yes [ ] No [ ]
B13	Sending of a Cause information element in a RELEASE message when it is not the first clearing message	11.2.8	o		Yes [ ] No [ ]
B14	Sending of a Cause information element in a RELEASE COMPLETE message when it is not the first clearing message	11.2.9	o		Yes [ ] No [ ]
B15	Sending of a Sending complete information element in a SETUP message when en bloc sending	11.2.13	o		Yes [ ] No [ ]

B16	Sending of a Progress indicator information element in a SETUP message in connection with the provision of in-band information/patterns	11.2.13	o		Yes [ ] No [ ]
B17	Sending of a Calling party number information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B18	Sending of a Calling party subaddress information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B19	Sending of a Called party subaddress information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B20	Sending of a Low layer compatibility information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B21	Sending of a High layer compatibility information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B22	Sending of a Party category information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B23	Sending of a Progress indicator information element in a SETUP ACKNOWLEDGE message in connection with the provision of in-band information/patterns	11.2.14	o		Yes [ ] No [ ]
B24	Sending of a Channel identification information element in a RESTART message	11.3.1	D1:o	[ ]	o: Yes [ ] No [ ]
B25	Message formats and codings for non-segmented messages and information elements supported	11	m		Yes [ ]
B26	Message formats and codings for segmented message types and information elements supported	11	(A7 or A8):m	[ ]	m: Yes [ ]

G.3.6 Procedures for circuit mode call control

G.3.6.1 Call establishment at the originating interface

Item	Questions/feature	Reference	Status	N/A	Support
C1	Support of procedures for outgoing call at the originating interface	8.1	m		Yes [ ]

G.3.6.2 Call establishment at the destination interface

Item	Questions/feature	Reference	Status	N/A	Support
C2	Support of procedures for incoming call in a point-to-point configuration	8.2	Z4:m	[ ]	Yes [ ]
C3	Support of procedures for incoming call in a multipoint terminal configuration	8.2	Z5:m	[ ]	Yes [ ]
C4	Support of procedures for incoming call on a primary rate access	8.2	Z6:m	[ ]	Yes [ ]

G.3.6.3 Call clearing

Item	Questions/feature	Reference	Status	N/A	Support
C5	Support of call clearing procedures when tones/announcement not provided	8.3	m		Yes [ ]
C6	Support of call clearing procedures when tones/announcement provided	8.3	o		Yes [ ] No [ ]

G.3.6.4 Call collisions

Item	Questions/feature	Reference	Status	N/A	Support
C7	Support of the channel selection mechanism	8.5	m		Yes [ ]

G.3.6.5 Suspend and resume procedure

Item	Questions/feature	Reference	Status	N/A	Support
C8	Support of call suspend and resume procedure on a basic access	8.6	o		Yes [ ] No [ ]

G.3.7 Procedures for layer management

Item	Questions/feature	Reference	Status	N/A	Support
D1	Initiation of restart procedures	9.1	o		Yes [ ] No [ ]
D2	Receipt of RESTART	9.1	m		Yes [ ]
D3	Restart procedures - Restart collision	9.1	D1:m	[ ]	m: Yes [ ]

G.3.8 Timers

Item	Questions/feature	Reference	Status	N/A	Support
E1	Implementation of T301	10	o		Yes [ ] No [ ] Value [ ]
E2	Implementation of T302	10	m		Yes [ ] Value [ ]
E3	Implementation of T303	10	m		Yes [ ] Value [ ]
E4	Implementation of T304	10	m		Yes [ ] Value [ ]
E5	Implementation of T305	10	m		Yes [ ] Value [ ]
E6	Implementation of T306	10	C6:m	[ ]	m: Yes [ ]
E7	Implementation of T307	10	C8:m	[ ]	m: Yes [ ]
E8	Implementation of T308	10	m		Yes [ ]
E9	Implementation of T309	10	m		Yes [ ]
E10	Implementation of T310	10	m		Yes [ ]
E11	Implementation of T312	10	m		Yes [ ]
E12	Implementation of T314	10	A8:m	[ ]	m: Yes [ ] Value [ ]
E13	Implementation of T316	10	D1:m	[ ]	m: Yes [ ]
E14	Implementation of T317	10	m		Yes [ ] Value [ ]
E15	Implementation of T322	10	A22:m	[ ]	m: Yes [ ] Value [ ]

G.4 PICS proforma for ECMA-106 TE implementation

G.4.1 Implementation identification

Supplier	
Contact point for queries about the PICS	
Implementation Name(s) and Version(s)	
Other information necessary for full identification, e.g. name(s) and version(s) for machines and/or operating systems; system name(s)	

Only the first three items are required for all implementations; other information may be completed as appropriate in meeting the requirement for full identification.

The terms "Name" and "Version" should be interpreted appropriately to correspond with a suppliers terminology (e.g. Type, Series, Model).

G.4.2 Protocol summary

Protocol version	3rd Edition
Addenda implemented	
Amendments implemented	
Have any exception items been required?	No [ ] Yes [ ] (The answer "Yes" means that the implementation does not conform to this Standard)

Date of Statement	

G.4.3 Major capabilities

Item	Questions/feature	Reference	Status	N/A	Support
Z1	Support of the 64 kbps unrestricted bearer	12.5.5	o.1		Yes [ ] No [ ]
Z2	Support of the 64 kbps bearer with speech transfer capability	12.5.5	o.1		Yes [ ] No [ ]
Z3	Support of the 64 kbps bearer with 3.1 khz audio transfer capability	12.5.5	o.1		Yes [ ] No [ ]
Z4	Support of point-to-point configuration for basic access		o.2		Yes [ ] No [ ]
Z5	Support of multipoint configuration for basic access		o.2		Yes [ ] No [ ]
Z6	Support of primary rate access		o.2		Yes [ ] No [ ]
Z7	Support of outgoing calls		o.3		Yes [ ] No [ ]
Z8	Support of incoming calls		o.3		Yes [ ] No [ ]

G.4.4 General procedures

G.4.4.1 Use of the services of Layer 2

Item	Questions/feature	Reference	Status	N/A	Support
A1	Establishment of a data link connection	7.1.1	m		Yes [ ]
A2	Transfer of data	7.1.2	m		Yes [ ]

G.4.4.2 Message segmentation procedures

Item	Questions/feature	Reference	Status	N/A	Support
A3	Maximum message size generated	7.2	m		Size [ ]
A4	Maximum message size received	7.2	m		Size [ ]
A5	Length of data link information field generated < Maximum generated message size	7.2	o		Yes [ ] No [ ]
A6	Length of data link information field received < Maximum received message size	7.2	o		Yes [ ] No [ ]
A7	Procedures for message segmentation	7.2	c.1		m: Yes [ ] x: No [ ]
A8	Procedures for message reassembly	7.2	A6:m	[ ]	m: Yes [ ]

c.1 If A5, then mandatory
else, prohibited

G.4.4.3 Handling of protocol error conditions

Item	Questions/feature	Reference	Status	N/A	Support
A9	Treatment of protocol discriminator error	7.3	m		Yes [ ]
A10	Treatment of too short message	7.3	m		Yes [ ]
A11	Treatment of call reference errors	7.3	m		Yes [ ]
A12	Treatment of message type or sequence errors	7.3	m		Yes [ ]
A13	Treatment of general information errors	7.3	m		Yes [ ]
A14	Treatment of mandatory information element errors	7.3	m		Yes [ ]
A15	Treatment of non-mandatory information element errors	7.3	m		Yes [ ]
A16	Treatment of data link reset	7.3	m		Yes [ ]
A17	Treatment of data link failure	7.3	m		Yes [ ]

G.4.4.4 Status and status enquiry

Item	Questions/feature	Reference	Status	N/A	Support
A18	Receipt of a STATUS ENQUIRY message	7.5	m		Yes [ ]
A19	Sending of a STATUS ENQUIRY message	7.5	o		Yes [ ]
A20	Receipt of a solicited STATUS message	7.5	A19:m	[ ]	m: Yes [ ]
A21	Receipt of an unsolicited STATUS message	7.5	m		Yes [ ]

G.4.5 Messages and information elements for general procedures

G.4.5.1 Outgoing calls

This table shall apply only if the answer to item Z7 is "Yes".

Item	Questions/feature	Reference	Status	N/A	Support
B1	Receipt of the messages in accordance with the procedures supported and receipt of all the permitted information elements in those messages	11	m		Yes [ ]
B2	Sending of messages, including for each message those information elements marked as mandatory for that message, in accordance with procedures supported	11	m		Yes [ ]
B3	Sending of a Sending complete information element in an INFORMATION message when overlap sending is complete	11.2.6	C2:o	[ ]	o: Yes [ ] No [ ]
B4	Sending of a Cause information element in a RELEASE message when it is not the first clearing message	11.2.8	o		Yes [ ] No [ ]
B5	Sending of a Cause information element in a RELEASE COMPLETE message when it is not the first clearing message	11.2.9	o		Yes [ ] No [ ]
B6	Sending of a Call identity information element in a RESUME message	11.2.10	o		Yes [ ] No [ ]
B7	Sending of a Channel identification information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B8	Sending of a Sending complete information element in a SETUP message when en bloc sending	11.2.13	C1:o	[ ]	o: Yes [ ] No [ ]
B9	Sending of a Progress indicator information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B10	Sending of a Calling party number information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B11	Sending of a Calling party subaddress information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B12	Sending of a Called party subaddress information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B13	Sending of a Low layer compatibility information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B14	Sending of a High layer compatibility information element in a SETUP message	11.2.13	o		Yes [ ] No [ ]
B15	Sending of a Call identity information element in a SUSPEND message	11.2.15	o		Yes [ ] No [ ]
B16	Sending of a Channel identification information element in a RESTART message	11.3.1	D1:o	[ ]	o: Yes [ ] No [ ]

B17	Message formats and codings for non-segmented messages and information elements supported	11	m		Yes [ ]
B18	Message formats and codings for segmented message types and information elements supported	11	(A7 or A8):m	[ ]	m: Yes [ ]

G.4.5.2 Incoming calls

This table shall apply only if the answer to item Z8 is "Yes".

Item	Questions/feature	Reference	Status	N/A	Support
B19	Receipt of the messages in accordance with the procedures supported and receipt of all the permitted information elements in those messages	11	m		Yes [ ]
B20	Sending of messages, including for each message those information elements marked as mandatory for that message, in accordance with procedures supported	11	m		Yes [ ]
B21	Sending of a Connected number information message element in a CONNECT message	11.2.3	o		Yes [ ] No [ ]
B22	Sending of a Connected subaddress information element in a CONNECT message	11.2.3	o		Yes [ ] No [ ]
B23	Sending of a Low layer compatibility information element in a CONNECT message	11.2.3	o		Yes [ ] No [ ]
B24	Sending of a Cause information element in a PROGRESS message	11.2.7	o		Yes [ ] No [ ]
B25	Sending of a Cause information element in a RELEASE message when it is not the first clearing message	11.2.8	o		Yes [ ] No [ ]
B26	Sending of a Cause information element in a RELEASE COMPLETE message when it is not the first clearing message	11.2.9	o		Yes [ ] No [ ]
B27	Sending of a Call identity information element in a RESUME message	11.2.10	o		Yes [ ] No [ ]
B28	Sending of a Call identity information element in as SUSPEND message	11.2.15	o		Yes [ ] No [ ]
B29	Sending of a Channel identification information element in a RESTART message	11.3.1	D1:o	[ ]	o: Yes [ ] No [ ]
B30	Message formats and codings for non-segmented messages and information elements supported	11	m		Yes [ ]
B31	Message formats and codings for segmented message types and information elements supported	11	(A7 or A8):m	[ ]	m: Yes [ ]

G.4.6 Procedures for circuit mode call control

G.4.6.1 Call establishment for outgoing call

Item	Questions/feature	Reference	Status	N/A	Support
C1	Support of en bloc sending procedures	8.1	Z7:o.4	[ ]	o: Yes [ ] No [ ]
C2	Support of overlap sending procedures	8.1	Z7:o.4	[ ]	o: Yes [ ] No [ ]

G.4.6.2 Call establishment for incoming call

Item	Questions/feature	Reference	Status	N/A	Support
C3	Support of procedures for incoming call over a point-to-point data link for basic access	8.2	(Z4 and Z8):m	[ ]	m: Yes [ ]
C4	Support of procedures for incoming call over a Broadcast data link for basic access	8.2	(Z5 and Z8):m	[ ]	m: Yes [ ]
C5	Support of procedures for incoming call on a primary rate access	8.2	(Z6 and Z8):m	[ ]	m: Yes [ ]

G.4.6.3 Call clearing

Item	Questions/feature	Reference	Status	N/A	Support
C6	Support of call clearing procedures when tones/announcement not provided	8.3	m		Yes [ ]
C7	Support of call clearing procedures when tones/announcement provided	8.3	m		Yes [ ]

G.4.6.4 Suspend and resume

Item	Questions/feature	Reference	Status	N/A	Support
C8	Support of call suspend and resume procedure on a basic access	8.6	(Z4 or Z5):o	[ ]	o: Yes [ ] No [ ]

G.4.7 Procedures for layer management

Item	Questions/feature	Reference	Status	N/A	Support
D1	Initiation of restart procedures	9.1	o		Yes [ ] No [ ]
D2	Receipt of RESTART	9.1	m		Yes [ ]
D3	Restart procedures - Restart collision	9.1	D1:m	[ ]	m: Yes [ ]

G.4.8 Timers

G.4.8.1 Outgoing calls

This table shall apply only if the answer to item Z7 is "Yes".

Item	Questions/feature	Reference	Status	N/A	Support
E1	Implementation of T301	10	o		Yes [ ] No [ ] Value [ ]
E2	Implementation of T304	10	C2:m	[ ]	m: Yes [ ]
E3	Implementation of T305	10	m		Yes [ ]
E4	Implementation of T308	10	m		Yes [ ]
E5	Implementation of T309	10	o		Yes [ ] No [ ] Value [ ]
E6	Implementation of T310	10	o		Yes [ ] No [ ]
E7	Implementation of T314	10	A8:m	[ ]	m: Yes [ ]
E8	Implementation of T316	10	D1:m	[ ]	m: Yes [ ]
E9	Implementation of T317	10	D1:m	[ ]	m: Yes [ ] Value [ ]
E10	Implementation of T322	10	A19:m	[ ]	m: Yes [ ]

G.4.8.2 Incoming calls

This table shall apply only if the answer to item Z8 is "Yes".

Item	Questions/feature	Reference	Status	N/A	Support
E11	Implementation of T305	10	m		Yes [ ]
E12	Implementation of T308	10	m		Yes [ ]
E13	Implementation of T309	10	o		Yes [ ] No [ ]
E14	Implementation of T313	10	m		Yes [ ]
E15	Implementation of T314	10	A8:m	[ ]	m: Yes [ ]
E16	Implementation of T316	10	D1:m	[ ]	m: Yes [ ]
E17	Implementation of T317	10	m		Yes [ ] Value [ ]
E18	Implementation of T322	10	A19:m	[ ]	m: Yes [ ]

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