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Foreword

ETSI Technical Reports (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 application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or I-ETS.

This ETR has been produced by the ISDN standards Management and Co-ordination Committee (IMCC) of the European Telecommunications Standards Institute (ETSI). It is maintained by the ISDN Management Team of the ETSI Secretariat.

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1 Scope

The purpose of this ETR is to provide a guide to the standards (and work items for standards) for the European ISDN. ETSI has published or will publish both European Telecommunication Standards (ETSs) or ETSI Technical Reports (ETRs) to specify or provide guidance on the services and standards for the European public ISDN and for Private Telecommunication Networks (PTNs) based on ISDN concepts (Private ISDNs), including terminal related specifications. This ETR identifies standards available and work items in progress. It provides an overview of the structure and inter-relationship of the ETSs, ETRs, and work items. It does not indicate their status.

This ETR does not cover all the standardisation work done by ETSI in the field of PTNs. It only covers PTN standardisation work based upon ISDN concepts and ISDN related concepts. PTNs based upon such concepts are termed "Private ISDNs". Standards relating to private networks based on other concepts (e.g. analogue networks) are excluded.

This ETR does not cover the standardisation work done by ETSI in the area of radio communications, satellite applications or CENTREX for ISDN.

2 Background to the ISDN - ITU-T Recommendations

An ISDN is a network providing end-to-end digital connectivity to support a wide range of telecommunication services. These services include voice and non-voice services to which customers have access by a small set of standard user-network interfaces by direct attachment of terminal equipment to the public network, or by the same type of interfaces provided at an exchange being part of a PTN and connected to the public network. The European ISDN standards include services which are offered in public ISDNs only, or in private ISDNs only, or in both public and private ISDNs.

The ITU-T (formerly CCITT) has prepared, in the I-Series, Recommendations which provide principles and guidelines on the ISDN concept, as well as detailed specifications. Information about the ISDN concept can be found in the following ITU-T Recommendations:

I.112 defines those terms that are considered essential to the understanding and application of the principles of an ISDN.

I.120 describes the concept, principles and structure of an ISDN.

I.130 provides a method for describing telecommunication services (Three stage methodology).

I.210.2 includes the description of the principles for defining telecommunication services supported by an ISDN including the concept of bearer services, teleservices and supplementary services.

I.310 describes the ISDN network functional principles.

I.410 describes general aspects and principles relating to the user-network interface.

Based on these principles the European Commission is encouraging the co-ordinated introduction of ISDN in Europe.

The European ISDN standards referred to in this ETR include:

- standards applying to public and private ISDNs;
- standards applying to public ISDNs only;
- standards applying to private ISDNs only.

3 Abbreviations

The following abbreviations are used throughout this ETR:

ANF	Additional Network Feature
ATS	Abstract Test Suite
CCITT	Comité Consultatif International Télégraphique et Téléphonique (replaced by ITU-T)
CTR	Common Technical Regulation
DECT	Digital European Cordless Telecommunications
EC	European Community
ECMA	European Computer Manufacturers Association
EDCT	European Digital Cellular Telecommunications (replaces GSM)
EMC	Electro-Magnetic Compatibility
EN	European Norms
ETR	ETSI Technical Report
ETS	ETSI European Telecommunication Standard
ETSI	European Telecommunications Standards Institute
FTAM	File Transfer Access and Management
GSM	Global System for Mobile communications (replaced by EDCT)

NOTE: The abbreviation "GSM" also stands for "Groupe Spécial Mobile".

ISDN	Integrated Services Digital Network
ISM	ISDN Standards Management
ISPBX	ISDN Private Branch Exchange
ISUP	ISDN User Part of ITU-T Signalling System No. 7
ITAEGT	Information Technology Advisory (and Co-ordination) Expert Group for private Telecommunication networks
ITU	International Telecommunication Union
ITU-T	International Telecommunication Union Telecommunications standardisation sector (replaces CCITT)
IVN	Intervening Network
MoU	Memorandum of Understanding
NET	Normes Européennes de Télécommunications
ONP	Open Network Provision
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PLMN	Public Land Mobile Network
PSPDN	Packet Switched Public Data Network
PSTN	Public Switched Telephone Network
PTN	Private Telecommunication Network
PTNX	Private Telecommunication Network Exchange
SC	Signalling Connection
SRC	Strategic Review Committee (on ISDN)
TBR	Technical Basis for Regulation
TC BTC	Technical Committee Business TeleCommunications
TCR-TR	Technical Committee Reference Technical Report
TE	Terminal Equipment
TRAC	Technical Regulations Application Committee
UIC	User Information Connection
VPN	Virtual Private Network

4 The Memorandum of Understanding (MoU) and the ETSI work programme

In 1989 a MoU was agreed and signed between European Network Operators to enable common ISDN services to be offered across Europe from 1992 onwards. This includes a minimum set of services that all signatories will provide (indicated by an asterisk (*) in table 1). This MoU requires:

- standards for a common range of services that all signatories will comply with;

- standards for user-network interfaces and protocols having the objective of enabling any customer equipment implemented to the required standards to be connected to and operated with the ISDN

provided by each party (terminal interchangeability, unique attachment specifications for Integrated Services Private Branch Exchanges (ISPBXs));

- standards for interconnecting national systems in order to provide international services.

Recognising the needs of the MoU, thereby taking into account the requirements of private networks, but also bearing in mind the limited resources available, ETSI's Strategic Review Committee Number 1 (SRC1) proposed a set of services and standards that would need to be established for the launching of the European ISDN in 1992 (see table 1).

Table 1: Services and standards

Bearer Services
Circuit-mode 64 kbit/s unrestricted *
Circuit-mode 3,1 kHz audio *
Packet-mode (X.31 case B) B- and D-channel
Circuit-mode speech
Teleservices
Telephony 3,1 kHz
Facsimile group 4 class 1
Teletex (see NOTE)
Telephony 7 kHz
Syntax-based videotex
Videotelephony
Supplementary Services
Calling Line Identification Presentation (CLIP) *
Calling Line Identification Restriction (CLIR) *
Direct Dialling In (DDI) *
Multiple Subscriber Number (MSN) *
Terminal Portability (TP) *
Call Waiting (CW)
Completion of Calls to Busy Subscriber (CCBS)
Closed User Group (CUG)
User-to-User Signalling (UUS)
Subaddressing (SUB)
Three-Party (3PTY)
Advice of Charge (AOC)
Connected Line Identification Presentation (COLP)
Connected Line Identification Restriction (COLR)
Malicious Call Identification (MCID)
Conference Call, Add On (CONF)
Meet Me Conference (MMC)
Freephone (FPH)
Explicit Call Transfer (ECT)
Call Forwarding Busy (CFB)
Call Forwarding No Reply (CFNR)
Call Forwarding Unconditional (CFU)
Call Deflection (CD)
Call Hold (HOLD)
Basic access and Primary rate access user-network interfaces
ISDN interconnection interfaces for the services identified above
End-to-end protocols for the services mentioned above
Network capabilities for the services mentioned above
NOTE: Since this list was compiled, ETSI has decided that teletex is no longer considered to be a teleservice, but an application of a bearer service. This is reflected in this ETR.

5 Commonality between public and private ISDN standardisation

As a basic objective, the ISDN standards, in particular those covering service descriptions, have been designed to be common to both public and private ISDNs.

The principle of terminal interchangeability is to ensure that a terminal equipment shall be (as far as possible) capable of participating in services independent of the actual network to which it is attached, i.e. different national ISDNs, private ISDNs, etc.

However, the ETSs describing a European ISDN include options that:

- cover historical variants of services and their usage in individual countries;

- allow for innovation.

Interworking between networks is assured. Where differences between the service definitions might affect terminal interchangeability, this is listed in an annex to the relevant ETS.

The ETSs also cover interworking of the European ISDN with private ISDNs that support services identical or similar to those of the public ISDN.

Again, whenever terminal interchangeability between public and private ISDNs might be affected, appropriate listings can be found in annexes to the private ISDN standards.

For the definition of terminal interchangeability and for the guidance on achieving terminal interchangeability see annex E.

For the alignment of standardisation principles between public and private ISDNs see annex F.

6 Attachment testing

An EC Council Directive (86/361/EEC) implemented a harmonised attachment testing regime in EEC countries. The principles of this Directive have also been adopted by the EFTA countries. The foundation for testing under this regime was Normes Européennes de Télécommunications (NETs), based upon ETSs produced by ETSI.

On 6th November 1992, a new EC Council Directive (91/263/EEC) replacing Directive 86/361/EEC came into force. The harmonised attachment testing regime continues to exist throughout Europe, but the basis for testing is now Common Technical Regulations (CTRs). The technical content of the CTRs is being developed by ETSI as Technical Basis for Regulations (TBRs). A TBR forms the technical basis of a CTR; the CTR also contains regulatory aspects added by TRAC (Technical Regulations Application Committee).

Relevant work items on TBRs have been identified as NOTES to the tables that form annex A of this ETR, or appear in the tables in annex B.

With regard to ISDNs implemented on the basis of ETSs referred to in the present Guide, an approval regime based on the ETSs developed by ETSI as Candidate NETs will be adopted by the competent national authorities until individual CTRs are formally adopted.

A number of Technical Basis for Regulation (TBR) have been produced for "ONP leased lines". These are identified by the appropriate tables in annex B.

7 Open Network Provision (ONP)

Open Network Provision (ONP) is intended to ensure "harmonised conditions for open and efficient access to and use of public telecommunications networks and, where applicable, public telecommunications services." The general principles of ONP are contained in Council Directive 90/387/EEC, the "ONP Framework Directive". These principles are applied to a number of areas of telecommunications, including ISDN and leased lines. ISDN is covered by Council Recommendation 92/383/EEC. Leased lines are covered by Council Directive, 92/44/EEC.

The CEC does not regard ETSs drawn up under an ONP mandate as different from ETSs drawn up in the normal way. However, a specific ONP directive can require ETSs drawn up under an ONP mandate to be implemented in all Member States. The precise wording of the directive needs to be consulted to ascertain the exact nature of the obligation.

European Telecommunication Standards (ETSs) have been produced to support "ONP leased lines".

For ISDN, ETSI has identified existing standards and work items that may fall within the scope of ONP applied to ISDN, and has notified the European Commission about the status of these.

A number of the standards listed in this ETR may therefore constitute a basis for harmonised access and/or service features in the context of ONP.

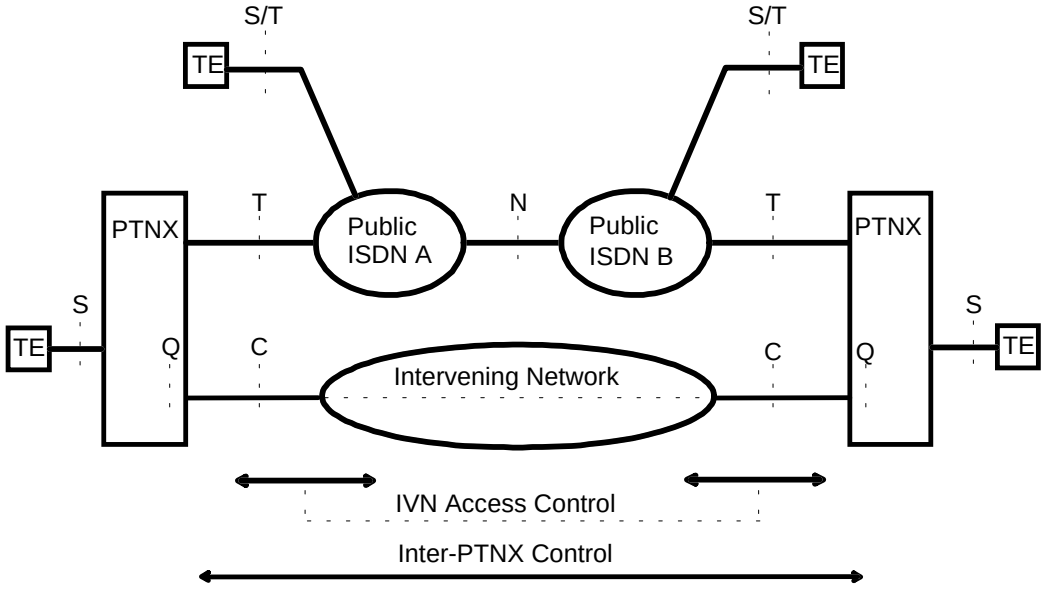
8 Numbering scheme for ETSs

Numbers for public and private ISDN related ETSs (and all other ETSs) commence from 300 001 and are allocated by ETSI on a consecutive basis. ETSs with such numbers can be purchased from the appropriate National Standards Organisation or directly from ETSI. No gaps are left in the ETS numbering scheme, therefore numbers do not relate to any organisational structure. Until such numbers are allocated by ETSI (when the document is ready for public enquiry) a temporary code is given that uniquely identifies the draft ETS or ETR. The unique code used is the ETSI work item number.

9 Introduction to annexes

9.1 Fields of application

The ETSs listed in this ETR are grouped in a number of annexes, according to their field of application. This subclause provides a structured overview of the annexes for understanding the inter-relationships between the ISDN standards. Figure 1 provides an overview of the reference points referred to in the matrices in the various annexes.



NOTE: The notation "S/T" should be read as "coincident S and T".

Figure 1: Overview of reference points for public ISDN and private ISDN

An explanation of the reference points illustrated in figure 1 is given in ITU-T Recommendations I.324 and I.411, and in ENV 41004.

The annexes of this ETR are as follows:

Annex A ISDN services

According to the definitions given in ITU-T Recommendation I.210.2, supplementary services are distinguished from basic services, which in turn can be separated into bearer services and teleservices. For all services the following description methodology (as defined in ITU-T Recommendation I.130 for the public ISDN and ETS 300 387 for the private ISDN) applies:

a) Stage 1 descriptions. Provide an overall description from the user's viewpoint;

b) Stage 2 descriptions. Identify the functional capabilities and the information flows needed to support the service described in stage 1;

c) Stage 3 descriptions. The user-network interface protocol standards in this group provide the specification of the signalling protocol at the user-network access to the public ISDN, as well as to private ISDNs for interworking with an attached private ISDN. The network control protocol standards in this group provide the specification of the signalling protocol at the international gateway between two public networks.

The logical context between the individual stage descriptions for the numerous services is given in annex A.

Annex B ISDN physical interfaces

Annex B contains matrices for interfaces at each of the reference points shown in figure 1 (i.e. at the C reference point, the N reference point, the S reference point, the coincident S and T reference point, and the T reference point). These matrices identify ETSs for signalling and information transmission. The physical interface aspects described in annex B also include service independent characteristics, such as safety, protection, electromagnetic compatibility and maintenance.

Annex C PTN network scenarios

At the C reference point a variety of service independent interfaces can occur, depending on the type of Intervening Network (IVN). Some of them are controllable by the PTNX (such as public ISDN when it is employed as an Intervening Network), others are not, e.g. leased lines. Although the Intervening Networks themselves need not be ISDNs, they are used in the context of establishing private ISDNs, and thus fall into the scope of this ETR.

Standards on scenarios applicable at the C reference point are listed in annex C. (For the interfaces themselves, annex C refers back to annex B).

Annex D Performance and network capabilities

Performance and network capabilities includes the ETSs and ETRs for public and private networks on:

- general network capabilities;

- routing, numbering and addressing, and service interworking aspects;

- interworking aspects between terminals and networks, and between networks.

These standards are listed in annex D.

9.2 Other application areas

The annexes described in subclause 9.1 above cover the main application areas for ISDN standards. There are two other application areas where ETSs and ETRs have been developed. These areas are:

Terminal specifications

Service dependent terminal specifications are listed together with the corresponding service specifications in annex A. They are categorised in three groups. The first group covers ETSs for protocols that operate on a terminal equipment to terminal equipment basis; these are listed in the matrix row labelled "end-to-end protocol". The second group covers ETSs for other terminal functions necessary to implement the service; these are listed in the matrix row labelled "terminal functions". ETSs for special terminal functions e.g. for the hard of hearing are listed in the matrix row labelled "special terminal functions".

Attachment requirements

Clause 6 briefly describes the attachment testing regime within Europe.

9.3 Conformance testing

Conformance testing specifications are appropriate to all standards except Stage 1 and Stage 2 descriptions; conformance to Stage 1 and Stage 2 is met by conformance to the Stage 3 standard and the end-to-end protocol standard if appropriate. Standards for the fields of application described above may contain conformance testing specifications either as an integral part or a separate ETS. Where separate standards for conformance testing have been produced these are listed in the same matrix as the standard defining the requirements.

9.4 Key to annexes

The following key applies to the matrices contained in annexes A - D:

N/A	Not applicable. No ETSI standard, ETR, (or ECMA or ITU-T equivalent) is appropriate to this entry.
- -	None; no ETSI standard, ETR or work item (or equivalent in ECMA or ITU-T) currently exists for this entry. This does not preclude their existence in the future. Where this applies for a complete table row, the row may be omitted from the matrix.
300 aaa	ETS 300 aaa is relevant.
300 aaa/Ax	ETS 300 aaa Amendment x is relevant.
300 aaa subclause 1.1	ETS 300 aaa subclause 1.1 is relevant.
ETR ddd	ETR ddd is relevant.
(ECMA-xxx)	Identifies the ECMA equivalent to the preceding ETSI standard or work item.
gt/c-sn	No relevant ETS, ETR, or other document currently exists but work item **gt/c-sn** is applicable. Each symbol of the work item number **gt/c-sn** is comprised of zero or more characters. The key to the composition of work item numbers is shown in table 2.
see table A.y	Table A.y in this ETR lists relevant standards.

Table 2: Key to composition of work item numbers

Field	Meaning
g	group: D = draft document, R = revision of existing document, MI = miscellaneous (no deliverable expected);
t	type of document to be delivered: E = ETS, I = I-ETS, TR = ETR or TC-TR or TCR-TR, TBR = TBR; this field is null (ie absent) in the case of Miscellaneous Items;
/	the literal slash character "/";
c	Technical Committee mnemonic: BTC, NA, SES, SMG, SPS, TE, TM, or related bodies: ECMA;
-	the literal dash character "-";
s	the subcommittee number, 01, 02, ..., 09, 10, 11, etc. For Items that are the direct responsibility of the parent Technical Committee rather than one of its Technical Subcommittees, 00 (zero zero) is used;
n	a number representing the individual item; this is a three digit number with leading zeros (i.e. numbering starts at 001 and progresses upwards); it is possible to have up to five digits in this field. Numeric fields are assigned uniquely, regardless of the document type. A numeric field may be suffixed with a further alphanumeric field indicating a subdivision of the work item.

For historical reasons, some work item numbers in use do not follow the rules outlined above. Examples of such work item numbers are "T/S 46-34.I".

9.5 Miscellaneous annexes

There are a number of supplementary annexes as follows:

Annex E - Terminal interchangeability;

Annex F - Principles for standardisation alignment between public and private ISDNs.

Annex A: ISDN services

A.1 Introduction

The tables contained in this annex list all the ETSs required for defining basic services (i.e. bearer and teleservices), specific applications within the terminal for bearer services, supplementary services, and network features additional to those required for a basic implementation.

These groups of services and other features are classified in subclauses as follows:

bearer services (A.4)

A bearer service consists of a connection (as identified by a bearer capability), and the network provision of subscription arrangements;

teleservices (A.5)

A teleservice consists of a connection or set of connections (as identified by a bearer capability), the network provision of subscription arrangements, and a set of higher layer terminal functions;

terminal applications of bearer services (A.6)

For this class the network provides a bearer service (see above), with no distinctive operation for a particular type of application. The terminal equipment may use one or more bearer service instances in providing a tailored application to meet user needs. The application is not a specific basic telecommunications service in its own right, although in some circumstances, it may appear so to the user. From the standards point of view, the distinguishing characteristic of an application of a bearer service is that the stage 1, stage 2, and stage 3 descriptions of the bearer service require no modification for the application to work.

supplementary services (A.7)

Supplementary services are any services provided by a network in addition to its basic service or services.

other telecommunication services (A.8)

This group comprises miscellaneous services that do not fall into one of the other classes of basic services or supplementary services.

additional network features (A.9)

An Additional Network Feature (ANF) is a capability, over and above that of a basic service, provided by an ISDN, but not directly to an ISDN user.

A.2 Key to tables in annex A

Each service, or other feature, is described in a separate subclause. Each subclause states the type of the service, and whether the service is applicable to the public ISDN, to the private ISDN, or to both. A table is used to identify the set of standards that exist for the service. The horizontal rows in each table are as follows:

Stage 1

This part is an overall description from the user's standpoint. The contents of the entry can vary as follows:

- where the service is only applicable to the public ISDN or only to the private ISDN, then the appropriate standard or work item for the stage 1 description of the service is given;

- where the service is applicable to both the public ISDN and to the private ISDN, and a common stage 1 description exists, this is listed;

- where the service is applicable to both the public ISDN and to the private ISDN, and different stage 1 descriptions exist for each case, each stage 1 description is identified. The stage 1 description for the public ISDN is listed before the stage 1 description for the private ISDN.

  A stage 1 description may exist for the public ISDN case and not the private ISDN case, or vice versa. In this case, the existing description is listed and the non-existant description is indicated by use of the "none" symbol, (- -). As above, the public ISDN case is listed first.

Stage 2

This part is an overall description of the organisation of the network functions and the information flows between them to map service requirements into network capabilities.

The format of the matrix entry follows the same rules as for stage 1 descriptions.

Stage 3S

This part is the definition of switching and signalling capabilities needed to support services at the access to a private network (S stands for S reference point). This entry is not included for tables where the service relates only to the public ISDN.

Stage 3S/T

This part is the definition of switching and signalling capabilities needed to support services at the access to a public ISDN used by a terminal (S/T stands for coincident S and T reference point) This entry is not included for tables where the service relates only to Private ISDNs.

Stage 3T

This part is the definition of switching and signalling capabilities needed to support services at the access to a public ISDN used by private network (S stands for S reference point). This entry is not included for tables where the service relates only to Private ISDNs.

Stage 3Q

This part is the definition of switching and signalling capabilities needed to support services within a private network (Q stands for Q reference point). This entry is not included for tables where the service relates only to the public ISDN.

Stage 3N

This part is the definition of switching and signalling capabilities needed to support services within or between public ISDNs (N stands for network). This entry is not included for tables where the service relates only to Private ISDNs.

End-to-end protocol

Under this item only user-plane protocol specifications are listed. This item is only included for bearer services, teleservices and terminal application of bearer services.

Terminal functions

Under this part, standards appropriate to terminals that implement this service or feature, but that are not included in the previous entries, are covered, This entry is only included for teleservices, terminal application of bearer services, and some relevant supplementary services.

Special terminal functions

Under this part, standards appropriate to some terminals designed for special purposes, that implement this service or feature are covered. Note that in some cases, these are listed only for the service or feature for which they were primarily intended; they may be of secondary application to other services or features. This part is only included when appropriate.

For each of the rows there is a column entry giving the relevant ETSs that specify the requirements, conformance testing, and attachment testing. ETRs are also included where relevant, and there is a column for equivalent ITU-T recommendations.

A.3 Notes to tables in annex A

The tables in annex A reference some notes contained in this subclause. These references are of the form "(NOTE x)". The notes are as follows:

NOTE 1: Generic procedures for supplementary services at stage 3S/T are included in ETS 300 122-1 (see ETS 300 122-2 for PICS) and ETS 300 196-1 (see ETS 300 196-2 for PICS). Conformance tests are contained in ETS 300 122-3 to ETS 300 122-6 and ETS 300 196-3 to ETS 300 196-6 respectively.

NOTE 2: Generic procedures for supplementary services at stage 3T are included in ETS 300 196-1 (see ETS 300 196-2 for PICS). Conformance tests are contained in ETS 300 196-3 to ETS 300 196-6.

NOTE 3: Generic procedures for supplementary services at stage 3S are included in ETS 300 190 (ECMA-156), ETS 300 240 (ECMA-161). Conformance tests for these standards have not yet been identified. Interactions of supplementary services at stage 3S have not been specified. A work item DE/ECMA-00026 has been stopped, but could be restarted in the future.

Priority for Private ISDN protocol work is being given to standards applicable at the Q reference point. Work items have not yet been created for standards applicable at the S reference point to avoid standstill being applied.

The generic procedures specified in ETS 300 190 (ECMA-156), ETS 300 240 (ECMA-161) may be used as the basis of proprietary implementation.

NOTE 4: Generic procedures for supplementary services at stage 3Q are included in ETS 300 239 (ECMA-165). Conformance tests are contained in DE/ECMA-00110.

NOTE 5: For identification of appropriate PICS and PIXIT proformas, see annex B subclauses B.4.1 and B.4.2.

NOTE 6: Interactions of supplementary services at stage 3S/T and at stage 3T are covered in ETS 300 195-1 (see ETS 300 195-2 for PICS proforma; ETS 300 195-3 to ETS 300 195-6 for ATS and PIXIT proforma).

NOTE 7: Interactions of supplementary services at stage 3Q are covered in ETS 300 427 (ECMA-204).

NOTE 8: General principles for the provision of telecommunication services to private networks at the T reference point are covered in ETS 300 345.

NOTE 9: References are given to standards for both Signalling System No. 7 ISUP version 1 and ISUP version 2.

NOTE 10: Generic procedures, additional to those in ISUP version 2 basic call, for use in supplementary services are contained in ETS 300 356-2.

NOTE 11: ETS 300 242 is a PSTN standard, but it may be used at the ISDN user-network interface.

NOTE 12: Information to support the call hold supplementary service needs to be transferred across an interface at the Q reference point; this is taken care of in the notification indicators defined in ETS 300 239 (ECMA-165).

NOTE 13: Information to support the call waiting supplementary service needs to be transferred across an interface at the Q reference point; this is taken care of in the notification indicators defined in ETS 300 239 (ECMA-165).

NOTE 14: There are no additional requirements over and above the basic call control requirements specified in ETS 300 102-1.

NOTE 15: From the private ISDN viewpoint the multiple subscriber number supplementary service is considered to be an integral part of the basic call description; no separate supplementary service ETSs exist in this case.

NOTE 16: From the private ISDN viewpoint the subaddressing supplementary service is considered to be an integral part of the basic call description; no separate supplementary service ETSs exist in this case.

NOTE 17: From the private ISDN viewpoint the terminal portability supplementary service is considered to be an integral part of the basic call description; no separate supplementary service ETSs exist in this case.

NOTE 18: Information to support the terminal portability supplementary service needs to be transferred across an interface at the Q reference point; this is taken care of in the notification indicators defined in ETS 300 239 (ECMA-165).

NOTE 19: In private ISDNs, the functionality provided by this supplementary service is offered by the conference call, add-on supplementary service.

NOTE 20: A generic Programming Communication Interface (PCI) for the Euro-ISDN is provided in ETS 300 325. Additional functionality is provided in ETS 300 325R1. Conformance testing is covered by DE/TE-02028-2 to DE/TE-02028-5.

A.4 Bearer services

A.4.1 Circuit-mode 3,1 kHz audio

Type: Bearer Applicable to: Public ISDN, Private ISDN

Table A.1: Circuit-mode 3,1 kHz audio bearer service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 110 ETS 300 171 (ECMA-142)	N/A	I.231.3
Stage 2	ETS 300 350 ETS 300 171 (ECMA-142)	N/A	Q.71
Stage 3S	ETS 300 192 (ECMA-106) (NOTE 5)	- -	Q.931
Stage 3S/T	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3T (NOTE 8)	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7	Q.931, Q.931bis Q.939
Stage 3Q	ETS 300 172 (ECMA-143 2nd Edition)	DE/ECMA-00109-1 DE/ECMA-00109-2	- -
Stage 3N (NOTE 9)	ETS 300 121 ETS 300 356-1 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764, Q.767, Q.784, Q.785
End-to-end protocol	ETS 300 084	ETS 300 084	G.711
Special terminal functions (NOTE 20)	- -	- -	- -

A.4.2 Circuit-mode 64 kbit/s unrestricted

Type: Bearer Applicable to: Public ISDN, Private ISDN

Table A.2: Circuit-mode 64 kbit/s unrestricted bearer service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 108 ETS 300 171 (ECMA-142)	N/A	I.231.1
Stage 2	ETS 300 350 ETS 300 171 (ECMA-142)	N/A	Q.71
Stage 3S	ETS 300 192 (ECMA-106) (NOTE 5)	- -	Q.931
Stage 3S/T	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3T (NOTE 8)	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3Q	ETS 300 172 (ECMA-143 2nd edition)	DE/ECMA-00109-1 DE/ECMA-00109-2	- -
Stage 3N (NOTE 9**)**	ETS 300 121 ETS 300 356-1 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764, Q.767, Q.784, Q.785
End-to-end protocol	N/A	N/A	- -
Special terminal function (NOTE 20)	- -	- -	- -

A.4.3 Circuit-mode speech

Type: Bearer Applicable to: Public ISDN, Private ISDN

Table A.3: Circuit-mode speech bearer service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 109 ETS 300 171 (ECMA-142)	N/A	I.231.2
Stage 2	ETS 300 350 ETS 300 171 (ECMA-142)	N/A	Q.71
Stage 3S	ETS 300 192 (ECMA-106) (NOTE 5)	- -	Q.931
Stage 3S/T	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3T (NOTE 8)	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3Q	ETS 300 172 (ECMA-143 2nd edition)	DE/ECMA-00109-1 DE/ECMA-00109-2	- -
Stage 3N (NOTE 9)	ETS 300 121 ETS 300 356-1 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764, Q.767, Q.784, Q.785
End-to-end protocol	ETS 300 083	ETS 300 083	G.711
Special terminal function (NOTE 20)	- -	- -	- -

A.4.4 Circuit-mode multiple-rate bearer service

Type: Bearer Applicable to: Public ISDN, Private ISDN

Table A.4: Circuit-mode multiple-rate bearer service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 389	N/A	I.231.10
Stage 2	ETS 300 350	N/A	Q.71
Stage 3S	- -	- -	Q.931, Q.939
Stage 3S/T	ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition	ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7	Q.931, Q.931bis Q.939
Stage 3T (NOTE 8)	ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition	ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7	Q.931, Q.931bis Q.939
Stage 3Q	- -	- -	- -
Stage 3N (NOTE 9)	MI/SPS-01010 ETS 300 356-1 DE/SPS-6007-1	- - DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764
End-to-end protocol	N/A	N/A	- -

A.4.5 Frame-Mode Bearer Service (FMBS)

Type: Bearer Applicable to: Public ISDN, Private ISDN

Table A.5: Frame-Mode Bearer Service (FMBS) bearer service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 399-1 ETS 300 399-2	N/A	I.233
Stage 2	- -	N/A	Q.72.2
Stage 3S	DE/ECMA-00043	- -	Q.933
Stage 3S/T	DE/SPS-05032	DE/SPS-05033	Q.933
Stage 3T **(NOTE 8)**	DE/SPS-05032	DE/SPS-05033	Q.933
Stage 3Q	- -	- -	- -
Stage 3N **(NOTE 9)**	- -	- -	- -
End-to-end protocol	ETS 300 402-3 ETS 300 402-5	DE/SPS-05031	Q.922

TCR-TR 020 provides guidelines for the development of stage 1, 2 and 3 descriptions for Frame Relay services, including Private Networks requirements. Various scenarios for the frame-mode bearer services are covered in ETR 145.

A.4.6 Packet-mode (X.31 case B) B- and D- channel

Type: Bearer Applicable to: Public ISDN, Private ISDN

Table A.6: Packet-mode (X.31 case B) B- and D- channel bearer service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 048 ETS 300 049	N/A	I.232.1
Stage 2	- -	N/A	Q.72.1
Stage 3S	- -	- -	- -
Stage 3S/T	ETS 300 007 DE/SPS-05041-1	DE/SPS-05003	Q.931, Q.931bis/X.31
Stage 3T (NOTE 8)	DE/SPS-05041-1	DE/SPS-05003	Q.931, Q.931bis/X.31
Stage 3Q	- -	- -	- -
End-to-end protocol	DE/SPS-05041-1	DE/SPS-05003	X.31
Special terminal functions (NOTE 20)	- -	- -	- -

TCR-TR 021 deals with possible enhancements required to the Packet-Mode Bearer Service. Various scenarios for the packet-mode bearer services are covered in DTR/NA-025103.

A.4.7 User Signalling Bearer Service (USBS)

Type: Bearer Applicable to: Public ISDN

Table A.7: User signalling bearer service (USBS) bearer service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010005	N/A	I.232.3
Stage 2	MI/SPS-01011	N/A	- -
Stage 3S/T (NOTE 8)	DE/SPS-05046-1 DE/SPS-05046-2	- -	Q.931 subclause 7.2
Stage 3T	DE/SPS-05046-1 DE/SPS-05046-2	- -	Q.931 subclause 7.2
Stage 3N (NOTE 9)	MI/SPS-01011	- -	- -
End-to-end protocol	DE/SPS-05046-1 DE/SPS-05046-2	- -	Q.931 subclause 7.2

A.5 Teleservices

A.5.1 Euro file transfer

ETR 074 contains background information on protocols for file transfer over the ISDN. Table A.8 identifies the standards necessary for the implementation of this teleservice. However, work is still in progress and the stage 3 standards will require minor revision to incorporate the necessary compatibility information element codepoints. Additionally, ETS 300 171 requires revision to allow the use of this teleservice in private ISDNs.

Type: Teleservice Applicable to: Public ISDN

Table A.8: Euro file transfer teleservice

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 409 ETS 300 171 (ECMA-142)	N/A	- -
Stage 2	ETS 300 350 ETS 300 171 (ECMA-142)	N/A	Q.71
Stage 3S	ETS 300 192 (ECMA-106) (NOTE 5)	- -	Q.931
Stage 3S/T	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3T (NOTE 8)	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3Q	ETS 300 172 (ECMA-143 2nd edition))	DE/ECMA-00109-1 DE/ECMA-00109-2	N/A
Stage 3N (NOTE 9)	ETS 300 121 ETS 300 356-1 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764, Q.767, Q.784, Q.785
End-to-end protocol	ETS 300 075 ETS 300 080 ETS 300 383 ETS 300 490-1	 ETS 300 155 ETS 300 490-2 DI/TE-01044-3	 T.90
Terminal functions	DE/TE-01043	- -	- -
Special terminal functions (NOTE 20)	- -	- -	- -

A.5.2 FTAM over ISDN

ETR 074 contains background information on protocols for file transfer over the ISDN. Table A.9 identifies the standards necessary for the implementation of this teleservice. However, work is still in progress and the stage 3 standards will require minor revision to incorporate the necessary compatibility information element codepoints. Additionally, ETS 300 171 requires revision to allow the use of this teleservice in private ISDNs.

Type: Teleservice Applicable to: Public ISDN, Private ISDN

Table A.9: FTAM over ISDN teleservice

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 410 ETS 300 171 (ECMA-142)	N/A	- -
Stage 2	ETS 300 350 ETS 300 171 (ECMA-142)	N/A	Q.71
Stage 3S	ETS 300 192 (ECMA-106) (NOTE 5)	- -	Q.931
Stage 3S/T	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3T (NOTE 8)	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3Q	ETS 300 172 (ECMA-143 2nd edition)	DE/ECMA-00109-1 DE/ECMA-00109-2	N/A
Stage 3N (NOTE 9)	ETS 300 121 ETS 300 356-1 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764, Q.767, Q.784, Q.785
End-to-end protocol	ETS 300 080 ETS 300 388 ETS 300 490-1	ETS 300 490-2 DI/TE-01044-3	- -
Terminal functions	DE/TE-01043	- -	- -
Special terminal functions (NOTE 20)	- -	- -	- -

A.5.3 Circuit-mode syntax-based videotex

Type: Teleservice Applicable to: Public ISDN, Private ISDN

Table A.10: Circuit-mode syntax-based videotex teleservice

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 262 ETS 300 171 (ECMA-142)	N/A	I.241.5
Stage 2	ETS 300 350 ETS 300 171 (ECMA-142)	N/A	Q.71
Stage 3S	ETS 300 192 (ECMA-106) (NOTE 5)	- -	Q.931
Stage 3S/T	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3T (NOTE 8)	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3Q	ETS 300 172 (ECMA-143 2nd edition)	DE/ECMA-00109-1 DE/ECMA-00109-2	- -
Stage 3N (NOTE 9)	ETS 300 121 ETS 300 356-1 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764, Q.767, Q.784, Q.785
End-to-end protocol	ETS 300 079 ETS 300 080	ETS 300 236 DE/TE-02024-2	T.90 - -
Terminal functions	ETS 300 072 ETS 300 072/R1 ETS 300 073 ETS 300 074 ETS 300 075 2nd edition ETS 300 076 2nd edition ETS 300 149 ETS 300 177 2nd edition ETS 300 222 ETS 300 382 ETS 300 382R1	- -	- -
Special terminal functions (NOTE 20)	- -	- -	- -

A.5.4 Packet-mode syntax-based videotex

Type: Teleservice Applicable to: Public ISDN

Table A.11: Packet-mode syntax-based videotex teleservice

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 262	N/A	I.241.5
Stage 2	- -	N/A	Q.72.1
Stage 3S/T	ETS 300 007 DE/SPS-05041-1	DE/SPS-05003	Q.931, Q.931bis X.31
Stage 3T (NOTE 8)	DE/SPS-05041-1	DE/SPS-05003	N/A
End-to-end protocol	ETS 300 218 ETS 300 223	- - ETS 300 236	T.90 N/A
Terminal functions	ETS 300 072 ETS 300 072/R1 ETS 300 073 ETS 300 074 ETS 300 075 2nd edition ETS 300 076 2nd edition ETS 300 149 ETS 300 177 2nd edition ETS 300 222 ETS 300 382 ETS 300 382/R1	- -	- -
Special terminal functions (NOTE 20)	- -	- -	- -

A.5.5 Teleaction

Type: Teleservice Applicable to: Public ISDN

Table A.12: Teleaction teleservice

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-012240	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S/T	- -	- -	- -
Stage 3T (NOTE 8)	- -	- -	- -
Stage 3N (NOTE 9)	N/A	N/A	- -
End-to-end protocol	- -	- -	- -
Terminal functions	- -	- -	- -

A.5.6 Telefax group 4

Type: Teleservice Applicable to: Public ISDN, Private ISDN

Table A.13: Telefax group 4 teleservice

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 120 ETS 300 171 (ECMA-142)	N/A	I.241.3
Stage 2	ETS 300 350 ETS 300 171 (ECMA-142)	N/A	Q.71
Stage 3S	ETS 300 192 (ECMA-106) (NOTE 5)	- -	Q.931
Stage 3S/T	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3T (NOTE 8)	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3Q	ETS 300 172 (ECMA-143 2nd edition)	DE/ECMA-00109-1 DE/ECMA-00109-2	N/A
Stage 3N (NOTE 9)	ETS 300 121 ETS 300 356-1 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764, Q.767, Q.784, Q.785
End-to-end protocol	ETS 300 080 ETS 300 112	ETS 300 155 DE/TE-02024-2 DE/TE-02019-2	T.90
Terminal functions	ETS 300 087	ETS 300 280	- -
Special terminal functions (NOTE 20)	ETS 300 154 ETS 300 243-1 ETS 300 243-1/R1	ETS 300 243-2 ETS 300 243-2/R1 DE/TE-02030	- -

A.5.7 Telephony 3,1 kHz

Type: Teleservice Applicable to: Public ISDN, Private ISDN

Table A.14: Telephony 3,1 kHz teleservice

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 111 ETS 300 171 (ECMA-142)	N/A	I.241.1
Stage 2	ETS 300 350 ETS 300 171 (ECMA-142)	N/A	Q.71
Stage 3S	ETS 300 192 (ECMA-106)	- -	Q.931
Stage 3S/T	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3T (NOTE 8)	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 ETR 018 4th edition (NOTE 5)	I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis Q.939
Stage 3Q	ETS 300 172 (ECMA-143 2nd edition)	DE/ECMA-00109-1 DE/ECMA-00109-2	N/A
Stage 3N (NOTE 9)	ETS 300 121 ETS 300 356-1 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764, Q.767, Q.784, Q.785
End-to-end protocol	ETS 300 082 (NOTE 20)	ETS 300 082 (NOTE 20)	G.711
Terminal functions	I-ETS 300 245-1 I-ETS 300 245-2	I-ETS 300 245-1 I-ETS 300 245-2	- -
Special terminal functions (NOTE 20)	I-ETS 300 245-3 I-ETS 300 245-4 I-ETS 300 245-7 ETS 300 295 ETS 300 381 I-ETS 300 400 ETS 300 488	I-ETS 300 245-3 I-ETS 300 245-4 I-ETS 300 245-7	- -

This service is defined as a service subject to "special or exclusive rights" under Commission Directive 90/388/EEC. Regulatory requirements and testing are covered in TBR 008. ETS 300 085 (Candidate NET 33) may apply in the interim.

The scope of TBR 008 does not cover all types of terminal equipment. Work item DE/BTC-02016 specifies regulatory requirements applicable for complex terminal equipment (i.e. ISPBX).

A.5.8 Telephony 7 kHz

Type: Teleservice Applicable to: Public ISDN, Private ISDN

Table A.15 identifies the standards necessary for the implementation of this teleservice. However, work is still in progress for private ISDNs; the stage 3 standards for private ISDNs will require minor revision to incorporate the necessary compatibility information element codepoints. Additionally, ETS 300 171 requires revision to allow the use of this teleservice in private ISDNs.

Table A.15: Telephony 7 kHz teleservice

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 263	N/A	I.241.7
Stage 2	ETS 300 265	N/A	- -
Stage 3S	ETS 300 192 (ECMA-106)	- -	Q.931
Stage 3S/T	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 267-1 ETS 300 267-1/A1 ETS 300 267-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 (NOTE 5)	ETS 300 267-3 ETS 300 267-4 ETS 300 267-5 ETS 300 267-6 I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis
Stage 3T (NOTE 8)	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 267-1 ETS 300 267-1/A1 ETS 300 267-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 (NOTE 5)	ETS 300 267-3 ETS 300 267-4 ETS 300 267-5 ETS 300 267-6 I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis
Stage 3Q	ETS 300 172 (ECMA-143 2nd edition)	DE/ECMA-00109-1 DE/ECMA-00109-2	N/A
Stage 3N (NOTE 9)	ETS 300 356-1 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764
End-to-end protocol	ETS 300 143 ETS 300 144 ETS 300 281	DE/TE-04120	G.722 G.725 H.221, H.242
Terminal functions	ETS 300 245-1 ETS 300 245-2	ETS 300 245-1 ETS 300 245-2	- -
Special terminal functions (NOTE 20)	I-ETS 300 245-4 I-ETS 300 245-5 I-ETS 300 245-6 I-ETS 300 245-7 I-ETS 300 245-8	I-ETS 300 245-4 I-ETS 300 245-5 I-ETS 300 245-6 I-ETS 300 245-7 I-ETS 300 245-8	- -

A.5.9 Videotelephony

Type: Teleservice Applicable to: Public ISDN, Private ISDN

Table A.16 identifies the standards necessary for the implementation of this teleservice. However, work is still in progress for private ISDNs; the stage 3 standards for private ISDNs will require minor revision to

incorporate the necessary compatibility information element codepoints. Additionally, ETS 300 171 requires revision to allow the use of this teleservice in private ISDNs.

Table A.16: Videotelephony teleservice

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 264	N/A	F.721
Stage 2	ETS 300 266	N/A	- -
Stage 3S	ETS 300 192 (ECMA-106) (NOTE 5)	- -	Q.931
Stage 3S/T	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 ETS 300 267-1 ETS 300 267-1/A1 ETS 300 267-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 (NOTE 5)	ETS 300 267-3 ETS 300 267-4 ETS 300 267-5 ETS 300 267-6 I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis
Stage 3T (NOTE 8)	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-2/A2 ETS 300 102-2 ETS 300 267-1 ETS 300 267-1/A1 ETS 300 267-2 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485 (NOTE 5)	ETS 300 267-3 ETS 300 267-4 ETS 300 267-5 ETS 300 267-6 I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7 (NOTE 5)	Q.931, Q.931bis
Stage 3Q	ETS 300 172 (ECMA-143 2nd edition)	DE/ECMA-00109-1 DE/ECMA-00109-2	N/A
Stage 3N (NOTE 9)	ETS 300 356-1 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.761, Q.762, Q.763, Q.764
End-to-end protocol	ETS 300 142 ETS 300 143 ETS 300 144 ETS 300 145	ETS 300 142 DE/TE-04120	H.261 H.221 H.230 H.242 H.320
Terminal functions	I-ETS 300 302-1 I-ETS 300 442 DI/TE-04008.3 DI/TE-04008.5 DI/TE-04008.7 DE/TE-04111 ETR 175 DTR/TE-04113	I-ETS 300 302-1 I-ETS 300 442 DI/TE-04008.3 DI/TE-04008.5 DI/TE-04008.7 DE/TE-04111	- -
Special terminal functions (NOTE 20)	ETS 300 245-3 ETS 300 295 DI/TE-04008.2 DI/TE-04008.4 DI/TE-04114	ETS 300 245-3 DI/TE-04008.2 DI/TE-04008.4 DI/TE-04114	- -

A.6 Terminal applications of bearer services

A.6.1 Channel aggregation (n*64 kbit/s)

Type: Application Applicable to: Public ISDN, Private ISDN

Table A.17: Channel aggregation (n*64 kbit/s) terminal application

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
End-to-end protocol	ETS 300 481	- -	- -
Terminal	ETS 300 481	- -	- -

DTR/BT-04004 examines methods of aggregating multiple channels bearing multiple services in corporate networks. It describes the mechanisms and signalling to support the provision of dynamic bandwidth management.

For all other requirements for this application, see circuit-mode 64 kbit/s unrestricted bearer service (table A.2).

A.6.2 Teletex

Type: Application Applicable to: Public ISDN, Private ISDN

Table A.18: Teletex terminal application

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
End-to-end protocol	ETS 300 080 ETS 300 081 ETS 300 112	DE/TE-02024-2 ETS 300 081	T.90
Terminal functions	ETS 300 015 ETR 052	ETS 300 017	- -
Special terminal functions (NOTE 20)	ETS 300 154 ETS 300 243-1 ETS 300 243-1/R1	 ETS 300 243-2 ETS 300 243-2/R1	- -

For all other requirements for this application, see circuit-mode 64 kbit/s unrestricted bearer service (table A.2).

A.6.3 V.110 terminal adaptation

Type: Application Applicable to: Public ISDN, Private ISDN

Table A.19: V.110 terminal adaptation terminal application

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
End-to-end protocol	ETS 300 103	- -	V.110/X.30
Terminal	- -	- -	- -
Special terminal functions (NOTE 20)	- -	- -	- -

For all other requirements for this application, see circuit-mode 64 kbit/s unrestricted bearer service (table A.2).

A.6.4 X.31 case A

Type: Application Applicable to: Public ISDN, Private ISDN

Table A.20: X.31 case A terminal application

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
End-to-end protocol	ETS 300 007 DE/SPS-05041-1	DE/SPS-05003	X.31
Terminal	- -	- -	- -
Special terminal functions (NOTE 20)	- -	- -	- -

For all other requirements for this application, see circuit-mode 64 kbit/s unrestricted bearer service (table A.2).

A.6.5 Telefax group 3

Type: Application Applicable to: Public ISDN, Private ISDN

Table A.21: Telefax group 3 application

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
End-to-end protocol	ETS 300 242 ETS 300 242/A1 ETS 300 242/A2 (NOTE 11)	ETS 300 242 ETS 300 242/A1 ETS 300 242/A21 (NOTE 11)	X.31
Terminal	- -	- -	- -
Special terminal functions (NOTE 20)	ETS 300 243-1 ETS 300 243-1/R1	ETS 300 243-2 ETS 300 243-2/R1	- -

For all other requirements for this application, see circuit-mode 3,1 kHz audio bearer service (table A.1).

NOTE 21: This matrix may be extended later to take into account groups 3C and 3F.

A.7 Supplementary services

A.7.1 Services for which work has been suspended

Since Edition 1 of this ETR was published, work on some supplementary services has been temporarily suspended. The supplementary services affected are:

- Additional Information Presentation (AIP);
- In-call Modification (IM): (only private ISDN version suspended);
- Serial Call (SC), and;
- Supervisory Information Presentation (SIP).

A.7.2 Additional Information Presentation (AIP)

Type: Supplementary Applicable to: Private ISDN

Table A.22: Additional Information Presentation (AIP) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00079 (ECMA-AIPSD-1)	N/A	- -
Stage 2	DE/ECMA-00080 (ECMA-AIPSD-2)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	- -	- -	- -

A.7.3 Advice Of Charge - at call set up time (AOC-S)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.23: Advice Of Charge - at call set up time (AOC-S) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 178 DE/ECMA-00009 (ECMA-ACSD)	N/A	I.256.2a
Stage 2	ETS 300 181 DE/ECMA-00009 (ECMA-ACSD)	N/A	Q.86.2
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 182-1 ETS 300 182-2	ETS 300 182-3 ETS 300 182-4 ETS 300 182-5 ETS 300 182-6	Q.956.2
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 182-1 ETS 300 182-2	ETS 300 182-3 ETS 300 182-4 ETS 300 182-5 ETS 300 182-6	Q.956.2
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00051 (ECMA-QSIG-AC)	- -	- -
Stage 3N (NOTE 9)	N/A	N/A	N/A

A.7.4 Advice Of Charge - at the end of the call (AOC-E)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.24: Advice Of Charge - at the end of the call (AOC-E) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 180 DE/ECMA-00009 (ECMA-ACSD)	N/A	I.256.2c
Stage 2	ETS 300 181 DE/ECMA-00009 (ECMA-ACSD)	N/A	Q.86.2
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 182-1 ETS 300 182-2	ETS 300 182-3 ETS 300 182-4 ETS 300 182-5 ETS 300 182-6	Q.956.2
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 182-1 ETS 300 182-2	ETS 300 182-3 ETS 300 182-4 ETS 300 182-5 ETS 300 182-6	Q.956.2
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00051 (ECMA-QSIG-AOC)	- -	- -
Stage 3N (NOTE 9)	N/A	N/A	- -
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.5 Advice Of Charge - during the call (AOC-D)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.25: Advice Of Charge - during the call (AOC-D) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 179 DE/ECMA-00009 (ECMA-ACSD)	N/A	I.256.2b
Stage 2	ETS 300 181 DE/ECMA-00009 (ECMA-ACSD)	N/A	Q.86.2
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 182-1 ETS 300 182-2	ETS 300 182-3 ETS 300 182-4 ETS 300 182-5 ETS 300 182-6	Q.956.2
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 182-1 ETS 300 182-2	ETS 300 182-3 ETS 300 182-4 ETS 300 182-5 ETS 300 182-6	Q.956.2
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00051 (ECMA-QSIG-AOC)	- -	- -
Stage 3N (NOTE 9)	N/A	N/A	- -
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.6 Advice Of Charge - on user request (AOC-U)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.26: Advice Of Charge - on user request (AOC-U) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010026 - -	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	- -	- -	- -
Stage 3N (NOTE 9)	N/A	N/A	- -

A.7.7 Call Deflection (CD)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.27: Call Deflection (CD) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 202 ETS 300 256 (ECMA 173)	N/A	I.252.5
Stage 2	ETS 300 206 ETS 300 256 (ECMA 173)	N/A	Q.82.5
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 207-1 ETS 300 207-1/A1 ETS 300 207-2 ETS 300 207-2/A1	ETS 300 207-3 ETS 300 207-4 ETS 300 207-5 ETS 300 207-6	Q.952.2-5
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 207-1 ETS 300 207-1/A1 ETS 300 207-2 ETS 300 207-2/A1	ETS 300 207-3 ETS 300 207-4 ETS 300 207-5 ETS 300 207-6	Q.952.2-5
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 257 (ECMA 174)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-15 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	Q.732.2-5

A.7.8 Call Distribution to Attendant (CDA)

Type: Supplementary Applicable to: Private ISDN

Table A.28: Call Distribution to Attendant (CDA) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00081 (ECMA-CDASD)	N/A	- -
Stage 2	DE/ECMA-00081 (ECMA-CDASD)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00104 (ECMA-QSIG-CDA)	- -	- -

A.7.9 Call Forwarding Busy (CFB)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.29: Call Forwarding Busy (CFB) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 199 ETS 300 256 (ECMA-173)	N/A	I.252.2
Stage 2	ETS 300 203 ETS 300 256 (ECMA-173)	N/A	Q.82.2
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 207-1 ETS 300 207-1/A1 ETS 300 207-2 ETS 300 207-2/A1	ETS 300 207-3 ETS 300 207-4 ETS 300 207-5 ETS 300 207-6	Q.952.2-5
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 207-1 ETS 300 207-1/A1 ETS 300 207-2 ETS 300 207-2/A1	ETS 300 207-3 ETS 300 207-4 ETS 300 207-5 ETS 300 207-6	Q.952.2-5
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 257 (ECMA-174)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-15 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	Q.732.2-5

A.7.10 Call Forwarding No Reply (CFNR)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.30: Call Forwarding No Reply (CFNR) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 201 ETS 300 256 (ECMA-173)	N/A	I.252.3
Stage 2	ETS 300 205 ETS 300 256 (ECMA-173)	N/A	Q.82.3
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 207-1 ETS 300 207-1/A1 ETS 300 207-2 ETS 300 207-2/A1	ETS 300 207-3 ETS 300 207-4 ETS 300 207-5 ETS 300 207-6	Q.952.2-5
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 207-1 ETS 300 207-1/A1 ETS 300 207-2 ETS 300 207-2/A1	ETS 300 207-3 ETS 300 207-4 ETS 300 207-5 ETS 300 207-6	Q.952.2-5
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 257 (ECMA-174)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-15 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	Q.732.2-5

A.7.11 Call Forwarding Unconditional (CFU)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.31: Call Forwarding Unconditional (CFU) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 200 ETS 300 256 (ECMA-173)	N/A	I.252.4
Stage 2	ETS 300 204 ETS 300 256 (ECMA-173)	N/A	Q.82.4
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 207-1 ETS 300 207-1/A1 ETS 300 207-2 ETS 300 207-2/A1	ETS 300 207-3 ETS 300 207-4 ETS 300 207-5 ETS 300 207-6	Q.952.2-5
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 207-1 ETS 300 207-1/A1 ETS 300 207-2 ETS 300 207-2/A1	ETS 300 207-3 ETS 300 207-4 ETS 300 207-5 ETS 300 207-6	Q.952.2-5
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 257 (ECMA-174)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-15 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	Q.732.2-5

A.7.12 Call Forwarding Unconditional to a Service Centre (CFU-S)

Type: Supplementary Applicable to: Public ISDN

Table A.32: Call Forwarding Unconditional to a Service Centre (CFU-S) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010018 - -	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S/T (NOTE 1) (NOTE 6)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.13 Call Hold (HOLD)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.33: Call Hold (HOLD) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 139	N/A	I.253.2
Stage 2	ETS 300 140	N/A	Q.83.2
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 141-1 ETS 300 141-2	ETS 300 141-3 ETS 300 141-4 ETS 300 141-5 ETS 300 141-6	Q.953.2
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 141-1 ETS 300 141-2	ETS 300 141-3 ETS 300 141-4 ETS 300 141-5 ETS 300 141-6	Q.953.2
Stage 3Q (NOTE 4) (NOTE 7)	(NOTE 12)	N/A	N/A
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-16 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	Q.733.2

A.7.14 Call Intrusion (CI)

Type: Supplementary Applicable to: Private ISDN

Table A.34: Call Intrusion (CI) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 425 (ECMA-202)	N/A	- -
Stage 2	ETS 300 425 (ECMA-202)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q	ETS 300 426 (ECMA-203)	- -	- -

A.7.15 Call Offer (CO)

Type: Supplementary Applicable to: Private ISDN

Table A.35: Call Offer (CO) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 361 (ECMA-191)	N/A	- -
Stage 2	ETS 300 361 (ECMA-191)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 362 (ECMA-192)	- -	- -

A.7.16 Call Waiting (CW)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.36: Call Waiting (CW) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 056	N/A	I.253.1
Stage 2	ETS 300 057	N/A	Q.83.1
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 058-1 ETS 300 058-2	ETS 300 058-3 ETS 300 058-4 ETS 300 058-5 ETS 300 058-6	Q.953.1
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 058-1 ETS 300 058-2	ETS 300 058-3 ETS 300 058-4 ETS 300 058-5 ETS 300 058-6	Q.953.1
Stage 3Q (NOTE 4) (NOTE 7)	(NOTE 13)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-17 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	Q.733.1
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.17 Calling Line Identification Presentation (CLIP)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.37: Calling Line Identification Presentation (CLIP) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 089 ETS 300 173 (ECMA-148)	N/A	I.251.3
Stage 2	ETS 300 091 ETS 300 173 (ECMA-148)	N/A	Q.81.3
Stage 3S (NOTE 3)	ETS 300 191 (ECMA-157)	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 092-1 ETS 300 092-1/A1 ETS 300 092-1/A2 ETS 300 092-2	ETS 300 092-3 ETS 300 092-4 ETS 300 092-5 ETS 300 092-6	Q.951.3
Stage 3T (NOTE 6) (NOTE 8)	ETS 300 092-1 ETS 300 092-2	ETS 300 092-3 ETS 300 092-4 ETS 300 092-5 ETS 300 092-6	Q.951.3
Stage 3Q (NOTE 7)	ETS 300 172 (ECMA-143)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 121 ETS 300 356-3 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.731.3, Q.767, Q.784, Q.785
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.18 Calling Line Identification Restriction (CLIR)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.38: Calling Line Identification Restriction (CLIR) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 090 ETS 300 173 (ECMA-148)	N/A	I.251.4
Stage 2	ETS 300 091 ETS 300 173 (ECMA-148)	N/A	Q.81.4
Stage 3S (NOTE 3)	ETS 300 191 (ECMA-157)	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 093-1 ETS 300 093-2	ETS 300 093-3 ETS 300 093-4 ETS 300 093-5 ETS 300 093-6	Q.951.4
Stage 3T (NOTE 6) (NOTE 8)	ETS 300 093-1 ETS 300 093-2	ETS 300 093-4 ETS 300 093-5 ETS 300 093-6 ETS 300 093-7	Q.951.4
Stage 3Q (NOTE 7)	ETS 300 172 (ECMA-143)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 121 ETS 300 356-4 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.731.4, Q.767, Q.784, Q.785
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.19 Calling Name Identification Presentation (CNIP)

Type: Supplementary Applicable to: Private ISDN

Table A.39: Calling Name Identification Presentation (CNIP) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 237 (ECMA-163)	N/A	- -
Stage 2	ETS 300 237 (ECMA-163)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 238 (ECMA-164)	- -	- -

A.7.20 Calling/Connected Name Identification Restriction (CNIR)

Type: Supplementary Applicable to: Private ISDN

Table A.40: Calling/Connected Name Identification Restriction (CNIR) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 237 (ECMA-163)	N/A	- -
Stage 2	ETS 300 237 (ECMA-163)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 238 (ECMA-164)	- -	- -

A.7.21 Charge Card Calling (CCC)

Type: Supplementary Applicable to: Public ISDN

Table A.41: Charge Card Calling (CCC) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010012	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S/T (NOTE 1)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.22 Closed User Group (CUG)

Type: Supplementary Applicable to: Public ISDN

Table A.42: Closed User Group (CUG) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 136	N/A	I.255.1
Stage 2	ETS 300 137	N/A	Q.85.1
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 138-1 ETS 300 138-1/A1 ETS 300 138-2	ETS 300 138-3 ETS 300 138-4 ETS 300 138-5 ETS 300 138-6	Q.955.1
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 138-1 ETS 300 138-1/A1 ETS 300 138-2	ETS 300 138-3 ETS 300 138-4 ETS 300 138-5 ETS 300 138-6	Q.955.1
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 121 ETS 300 356-9	ETS 300 335	Q.735.1, Q.767, Q.784, Q.785

A.7.23 Completion of Calls on No Reply (CCNR)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.43: Completion of Calls on No Reply (CCNR) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010027 ETS 300 365 (ECMA-185)	N/A	- -
Stage 2	ETS 300 365 (ECMA-185)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 366 (ECMA-186)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	- -	- -	- -

A.7.24 Completion of Calls to Busy Subscriber (CCBS)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.44: Completion of Calls to Busy Subscriber (CCBS) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 357 ETS 300 365 (ECMA-185)	N/A	I.253.3
Stage 2	ETS 300 358 ETS 300 365 (ECMA-185)	N/A	Q.83.3
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 359-1 ETS 300 359-2	ETS 300 359-3 ETS 300 359-4 ETS 300 359-5 ETS 300 359-6	Q.953.3
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 359-1 ETS 300 359-2	ETS 300 359-3 ETS 300 359-4 ETS 300 359-5 ETS 300 359-6	Q.953.3
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 366 (ECMA-186)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-18 DE/SPS-6007-1	DE/SPS-6007-2 DE:SPS-6007-3	Q.753.3

A.7.25 Conference Call, Add On (CONF)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.45: Conference Call, Add On (CONF) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 183 DE/ECMA-00011 (ECMA-CONFSD)	N/A	I.254.1
Stage 2	ETS 300 184 DE/ECMA-00011 (ECMA-CONFSD)	N/A	Q.84.1
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 185-1 ETS 300 185-1/A1 ETS 300 185-2	ETS 300 185-3 ETS 300 185-4 ETS 300 185-5 ETS 300 185-6	Q.954.1
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 185-1 ETS 300 185-1/A1 ETS 300 185-2	ETS 300 185-3 ETS 300 185-4 ETS 300 185-5 ETS 300 185-6	Q.954.1
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00050 (ECMA-QSIG-CONF)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-12 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	Q.734.1

A.7.26 Connected Line Identification Presentation (COLP)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.46: Connected Line Identification Presentation (COLP) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 094 ETS 300 173 (ECMA-148)	N/A	I.252.5
Stage 2	ETS 300 096 ETS 300 173 (ECMA-148)	N/A	Q.81.5
Stage 3S (NOTE 3)	ETS 300 191 (ECMA-157)	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 097-1 ETS 300 097-1/A1 ETS 300 097-2	ETS 300 097-3 ETS 300 097-4 ETS 300 097-5 ETS 300 097-6	Q.951.5
Stage 3T (NOTE 6) (NOTE 8)	ETS 300 097-1 ETS 300 097-1/A1 ETS 300 097-2	ETS 300 097-3 ETS 300 097-4 ETS 300 097-5 ETS 300 097-6	Q.951.5
Stage 3Q	ETS 300 172 (ECMA-143 2nd edition)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 121 ETS 300 356-5 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.731.5, Q.767, Q.784, Q.785
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.27 Connected Line Identification Restriction (COLR)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.47: Connected Line Identification Restriction (COLR) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 095 ETS 300 173 (ECMA-148)	N/A	I.251.6
Stage 2	ETS 300 096 ETS 300 173 (ECMA-148)	N/A	Q.81.6
Stage 3S (NOTE 3)	ETS 300 191 (ECMA-157)	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 098-1 ETS 300 098-2	ETS 300 098-3 ETS 300 098-4 ETS 300 098-5 ETS 300 098-6	Q.951.6
Stage 3T (NOTE 6) (NOTE 8)	ETS 300 098-1 ETS 300 098-2	ETS 300 098-3 ETS 300 098-4 ETS 300 098-5 ETS 300 098-6	Q.951.6
Stage 3Q (NOTE 7)	ETS 300 172 (ECMA-143 2nd Edition)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 121 ETS 300 356-6 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.731.6, Q.767, Q.784, Q.785
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.28 Connected Name Identification Presentation (CONP)

Type: Supplementary Applicable to: Private ISDN

Table A.48: Connected Name Identification Presentation (CONP) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 237 (ECMA-163)	N/A	- -
Stage 2	ETS 300 237 (ECMA-163)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 238 (ECMA-164)	- -	- -

A.7.29 Controlled Diversion (CDIV)

Type: Supplementary Applicable to: Private ISDN

Table A.49: Controlled Diversion (CDIV) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 256 2nd Edition	N/A	- -
Stage 2	ETS 300 256 2nd Edition	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 257 2nd Edition	- -	- -

A.7.30 Controlled Diversion Consult (CDIVC)

Type: Supplementary Applicable to: Private ISDN

Table A.50: Controlled Diversion Consult (CDIVC) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 256 2nd Edition	N/A	- -
Stage 2	ETS 300 256 2nd Edition	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 257 2nd Edition	- -	- -

A.7.31 Direct Dialling In (DDI)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.51: Direct Dialling In (DDI) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 062	N/A	I.251.1
Stage 2	ETS 300 063	N/A	Q.81.1
Stage 3S (NOTE 3)	N/A	N/A	- -
Stage 3S/T (NOTE 1) (NOTE 6)	N/A	N/A	- -
Stage 3T (NOTE 6) (NOTE 8)	ETS 300 064-1 ETS 300 064-1/A1 ETS 300 064-2	ETS 300 064-3 ETS 300 064-4 ETS 300 064-5 ETS 300 064-6	Q.951.1
Stage 3Q (NOTE 7)	N/A	N/A	- -
Stage 3N (NOTE 9)	N/A	N/A	- -
Special terminal functions (NOTE 20)			

A.7.32 Do Not Disturb (DND)

Type: Supplementary Applicable to: Private ISDN

Table A.52: Do Not Disturb (DND) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 363 (ECMA-193)	N/A	- -
Stage 2	ETS 300 363 (ECMA-193)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 364 (ECMA-194)	- -	- -

A.7.33 Do Not Disturb Override (DNDO)

Type: Supplementary Applicable to: Private ISDN

Table A.53: Do Not Disturb Override (DNDO) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 363 (ECMA-193)	N/A	- -
Stage 2	ETS 300 363 (ECMA-193)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7**)**	ETS 300 364 (ECMA-194)	- -	- -

A.7.34 Explicit Call Transfer (ECT)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.54: Explicit Call Transfer (ECT) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 367 ETS 300 260 (ECMA-177)	N/A	I.252.1
Stage 2	ETS 300 368 ETS 300 260 (ECMA-177)	N/A	Q.82.1
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 369-1 ETS 300 369-2	ETS 300 369-3 ETS 300 369-4 ETS 300 369-5 ETS 300 369-6	Q.952.1
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 369-1 ETS 300 369-2	ETS 300 369-3 ETS 300 369-4 ETS 300 369-5 ETS 300 369-6	Q.952.1
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 261 (ECMA-178)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-14 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	Q.732.1

NOTE: This supplementary serice is called "Call Transfer (CT)" supplementary service is private ISDNs.

A.7.35 Fixed Outgoing Call Barring (OCB-F)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.55: Fixed Outgoing Call Barring (OCB-F) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010006	N/A	I.255.5
Stage 2	- -	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.36 Freephone (FPH)

Type: Supplementary Applicable to: Public ISDN

Table A.56: Freephone (FPH) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 208	N/A	- -
Stage 2	ETS 300 209	N/A	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 210-1 ETS 300 210-2	ETS 300 210-3 ETS 300 210-4 ETS 300 210-5 ETS 300 210-6	- -
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 210-1 ETS 300 210-2	ETS 300 210-3 ETS 300 210-4 ETS 300 210-5 ETS 300 210-6	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-13 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	- -

A.7.37 In-call Modification (IM)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.57: In-Call Modification (IM) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010002 DE/ECMA-00018 (ECMA-IMSD)	N/A	- -
Stage 2	- - DE/ECMA-00018 (ECMA-IMSD)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00057 (ECMA-QSIG-IM)	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.38 Line and Trunk Hunting (LTH)

Type: Supplementary Applicable to: Public ISDN

Table A.58: Line and Trunk Hunting (LTH) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010003	N/A	I.252.6
Stage 2	- -	N/A	Q.82.6
Stage 3S/T (NOTE 1)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.39 Malicious Call Identification (MCID)

Type: Supplementary Applicable to: Public ISDN

Table A.59: Malicious Call Identification (MCID) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 128	N/A	I.251.7
Stage 2	ETS 300 129	N/A	Q.81.7
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 130-1 ETS 300 130-2	ETS 300 130-3 ETS 300 130-4 ETS 300 130-5 ETS 300 130-6	Q.951.7
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 130-1 ETS 300 130-2	ETS 300 130-3 ETS 300 130-4 ETS 300 130-5 ETS 300 130-6	Q.951.7
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-11 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	Q.731.7

A.7.40 Meet Me Conference (MMC)

Type: Supplementary Applicable to: Public ISDN

Table A.60: Meet Me Conference (MMC) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 164	N/A	- -
Stage 2	ETS 300 165	N/A	- -
Stage 3S/T	N/A (NOTE 14)	N/A	N/A
Stage 3T (NOTE 8)	N/A (NOTE 14)	N/A	N/A
Stage 3N (NOTE 9)	N/A	N/A	N/A

A.7.41 Multiple Subscriber Number (MSN)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.61: Multiple Subscriber Number (MSN) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 050 ETS 300 171 (ECMA-142) (NOTE 15)	N/A	I.251.2
Stage 2	ETS 300 051 ETS 300 171 (ECMA-142) (NOTE 15)	N/A	Q.81.2
Stage 3S (NOTE 3)	ETS 300 192 (ECMA-106) (NOTE 15)	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 052-1 ETS 300 052-2	ETS 300 052-3 ETS 300 052-4 ETS 300 052-5 ETS 300 052-6	Q.951.2
Stage 3T	N/A	N/A	N/A
Stage 3Q (NOTE 7)	N/A	N/A	N/A
Stage 3N (NOTE 9)	N/A	N/A	N/A
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.42 Message Waiting Indication (MWI)

Type: Supplementary Applicable to: Public ISDN

Table A.62: Message Waiting Indication (MWI) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010033	N/A	
Stage 2	- -	N/A	
Stage 3S/T (NOTE 1) (NOTE 6)	DE/SPS-05069-1 DE/SPS-05069-2	- -	
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	DE/SPS-05069-1 DE/SPS-05069-2	- -	
Stage 3N (NOTE 9) (NOTE 10)	DE/SPS-01022-1 DE/SPS-6007-1	DE/SPS-6007-2 DE/SPS-6007-3	

A.7.43 Night Service (NS)

Type: Supplementary Applicable to: Private ISDN

Table A.63: Night Service (NS) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00085 (ECMA-NSSD)	N/A	- -
Stage 2	DE/ECMA-00085 (ECMA-NSSD)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00059 (ECMA-QSIG-NS)	- -	- -

A.7.44 Premium Rate (PRM)

Type: Supplementary Applicable to: Public ISDN

Table A.64: Premium Rate (PRM) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010014	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S/T (NOTE 1)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.45 Recall (RE)

Type: Supplementary Applicable to: Private ISDN

Table A.65: Recall (RE) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00100 (ECMA-RESD)	N/A	- -
Stage 2	DE/ECMA-00100 (ECMA-RESD)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00102 (ECMA-QSIG-RE)	- -	- -

A.7.46 Reverse Charging - at call set up time (REV-S)

Type: Supplementary Applicable to: Public ISDN

Table A.66: Reverse Charging At Call Set Up Time (REV-S) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010016	N/A	I.256.3
Stage 2	- -	N/A	Q.86.3
Stage 3S/T (NOTE 1)	DE/SPS-05068-1 DE/SPS-05068-2	- -	Q.956.3
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	Q.956.3
Stage 3N (NOTE 9)	DE/SPS-01021-1	- -	- -

A.7.47 Selective Call Forwarding Busy (SCFB)

Type: Supplementary Applicable to: Public ISDN

Table A.67: Selective Call Forwarding Busy (SCFB) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010008	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S/T (NOTE 1)	DE/SPS-05060-1 DE/SPS-05060-2	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	DE/SPS-05060-1 DE/SPS-05060-2	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.48 Selective Call Forwarding No Reply (SCFNR)

Type: Supplementary Applicable to: Public ISDN

Table A.68: Selective Call Forwarding No Reply (SCFNR) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010008	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S/T (NOTE 1)	DE/SPS-05060-1 DE/SPS-05060-2	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	DE/SPS-05060-1 DE/SPS-05060-2	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.49 Selective Call Forwarding Unconditional (SCFU)

Type: Supplementary Applicable to: Public ISDN

Table A.69: Selective Call Forwarding Unconditional (SCFU) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010008	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S/T (NOTE 1)	DE/SPS-05060-1 DE/SPS-05060-2	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	DE/SPS-05060-1 DE/SPS-05060-2	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.50 Serial Call (SC)

Type: Supplementary Applicable to: Private ISDN

Table A.70: Serial Call (SC) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00075 (ECMA-SESD-1)	N/A	- -
Stage 2	DE/ECMA-00076 (ECMA-SESD-2)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	- -	- -	- -

A.7.51 Subaddressing (SUB)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.71: Subaddressing (SUB) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 059 ETS 300 171 (ECMA-142) (NOTE 16)	N/A	I.251.8
Stage 2	ETS 300 060 ETS 300 171 (ECMA-142) (NOTE 16)	N/A	Q81.8
Stage 3S (NOTE 3)	ETS 300 192 (ECMA-106) (NOTE 16)	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 061-1 ETS 300 061-2	ETS 300 061-3 ETS 300 061-4 ETS 300 061-5 ETS 300 061-6	Q.951.8
Stage 3T (NOTE 6) (NOTE 8)	ETS 300 061-1 ETS 300 061-2	ETS 300 061-3 ETS 300 061-4 ETS 300 061-5 ETS 300 061-6	Q.951.8
Stage 3Q (NOTE 7)	ETS 300 172 (ECMA-143 2nd edition) (NOTE 16)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 121 ETS 300 356-10 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.731.8, Q.767, Q.784, Q.785
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.52 Supervisory Information Presentation (SIP)

Type: Supplementary Applicable to: Private ISDN

Table A.72: Supervisory information presentation (SIP) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00077 (ECMA-SIPSD-1)	N/A	- -
Stage 2	DE/ECMA-00078 (ECMA-SIPSD-2)	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	- -	- -	- -

A.7.53 Support of Private Numbering Plan (SPNP)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.73: Support of Private Numbering Plan (SPNP) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010004	N/A	I.255.2
Stage 2	- -	N/A	Q.85.2
Stage 3S (NOTE 3)	- -	- -	Q.955.2
Stage 3S/T (NOTE 1)	DE/SPS-05098-1	- -	Q.955.2
Stage 3T (NOTE 2) (NOTE 8)	DE/SPS-05098-1	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.54 Televoting (VOT)

Type: Supplementary Applicable to: Public ISDN

Table A.74: Televoting (VOT) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010015	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S/T (NOTE 1)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.55 Terminal Portability (TP)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.75: Terminal Portability (TP) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 053 ETS 300 171 (ECMA-142) (NOTE 17)	N/A	- -
Stage 2	ETS 300 054 ETS 300 171 (ECMA-142) (NOTE 17)	N/A	- -
Stage 3S (NOTE 3)	ETS 300 192 (ECMA-106) (NOTE 17)	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 055-1 ETS 300 055-2	ETS 300 055-3 ETS 300 055-4 ETS 300 055-5 ETS 300 055-6	Q.931 subclause 5.6, Q.931bis
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 055-1 ETS 300 055-2	ETS 300 055-3 ETS 300 055-4 ETS 300 055-5 ETS 300 055-6	Q.931 subclause 5.6, Q.931bis
Stage 3Q (NOTE 4) (NOTE 7)	(NOTE 18)	N/A	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 121 ETS 300 356-7 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.767, Q.784, Q.785
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.56 Three-Party (3PTY)

Type: Supplementary Applicable to: Public ISDN

Table A.76: Three-Party (3PTY) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 186 (NOTE 19)	N/A	I.254.2
Stage 2	ETS 300 187	N/A	Q.84.2
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 188-1 ETS 300 188-2	ETS 300 188-3 ETS 300 188-4 ETS 300 188-5 ETS 300 188-6	Q.954.2
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 188-1 ETS 300 188-2	ETS 300 188-3 ETS 300 188-4 ETS 300 188-5 ETS 300 188-6	Q.954.2
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 356-19 DE/SPS 6007-1	DE/SPS 6007-2 DE/SPS 6007-3	Q.734.2

A.7.57 Unconditional Reverse Charging (REV-U)

Type: Supplementary Applicable to: Public ISDN

Table A.77: Unconditional Reverse Charging (REV-U) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010017	N/A	I.256.3
Stage 2	- -	N/A	Q.86.3
Stage 3S/T (NOTE 1)	DE/SPS-05068-1	DE/SPS-05068-2	Q.956.3
Stage 3T (NOTE 2) (NOTE 8)	DE/SPS-05068-1	DE/SPS-05068-2	Q.956.3
Stage 3N (NOTE 9)	- -	- -	- -

A.7.58 Universal Access Number (UAN)

Type: Supplementary Applicable to: Public ISDN

Table A.78: Universal Access Number (UAN) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010011	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S/T (NOTE 1)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.59 User Controlled Outgoing Call Barring (OCB-UC)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.79: User Controlled Outgoing Call Barring (OCB-UC) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010022	N/A	I.255.5
Stage 2	- -	N/A	- -
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.7.60 User-to-User Signalling (UUS)

Type: Supplementary Applicable to: Public ISDN, Private ISDN

Table A.80: User-to-user Signalling (UUS) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 284 DE/ECMA-00021 (ECMA-UUSD)	N/A	I.257.1
Stage 2	ETS 300 285 DE/ECMA-00021 (ECMA-UUSD)	N/A	Q.87.1
Stage 3S (NOTE 3)	- -	- -	- -
Stage 3S/T (NOTE 1) (NOTE 6)	ETS 300 286-1 ETS 300 286-2	ETS 300 286-3 ETS 300 286-4 ETS 300 286-5 ETS 300 286-6	Q.931 subclause 7 Q.957.1
Stage 3T (NOTE 2) (NOTE 6) (NOTE 8)	ETS 300 286-1 ETS 300 286-2	ETS 300 286-3 ETS 300 286-4 ETS 300 286-5 ETS 300 286-6	Q.931 subclause 7 Q.957.1
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00074 (ECMA-QSIG-UU)	- -	- -
Stage 3N (NOTE 9) (NOTE 10)	ETS 300 121 ETS 300 356-8 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	Q.737.1, Q.767, Q.784, Q.785
Special terminal functions (NOTE 20)	- -	- -	- -

A.7.61 Virtual Card Calling (VCC)

Type: Supplementary Applicable to: Public ISDN

Table A.81: Virtual Card Calling (VCC) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010013	N/A	- -
Stage 2	MI/SPS-01014	N/A	- -
Stage 3S/T (NOTE 3)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.8 Other telecommunication services

A.8.1 Remote Control of Supplementary Services (RCSS)

Type: Supplementary Applicable to: Public ISDN

Table A.82: Remote Control of Supplementary Services (RCSS)

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/NA-010009	N/A	- -
Stage 2	- -	N/A	- -
Stage 3S/T (NOTE 1)	- -	- -	- -
Stage 3T (NOTE 2) (NOTE 8)	- -	- -	- -
Stage 3N (NOTE 9)	- -	- -	- -

A.9 Additional Network Features

A.9.1 Additional network features for which work has been suspended

Since edition 1 of this technical report was published, work on some additional network features has been temporarily suspended. The ANFs affected are:

- ANF Alternate Routing Indication (ANF-ARI);
- ANF Common Information (ANF-CI);
- ANF Route Restriction (ANF-RR), and;
- ANF Source Routing (ANF-SR).

A.9.2 ANF Alternate Routing Indication (ANF-ARI)

Type: ANF Applicable to: Private ISDN

Table A.83: ANF Alternate Routing Indication (ANF-ARI)

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00069 (ECMA-RISD)	N/A	- -
Stage 2	DE/ECMA-00069 (ECMA-RISD)	N/A	- -
Stage 3S	- -	- -	- -
Stage 3Q (NOTE 4) (NOTE 7)	- -	- -	- -

A.9.3 ANF Call Interception (ANF-CINT)

Type: ANF Applicable to: Private ISDN

Table A.84: ANF Call Interception (ANF-CINT) supplementary service

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00089 (ECMA-CINTSD)	N/A	- -
Stage 2	DE/ECMA-00089 (ECMA-CINTSD)	N/A	- -
Stage 3S	- -	- -	- -
Stage 3Q	DE/ECMA-00103 (ECMA-QSIG-CINT)	- -	- -

A.9.4 ANF Common Information (ANF-CI)

Type: ANF Applicable to: Private ISDN

Table A.85: ANF Common Information (ANF-CI)

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00070 (ECMA-CISD)	N/A	- -
Stage 2	DE/ECMA-00070 (ECMA-CISD)	N/A	- -
Stage 3Q (NOTE 4) (NOTE 7)	- -	- -	- -

A.9.5 ANF Path Replacement (ANF-PR)

Type: ANF Applicable to: Private ISDN

Table A.86: ANF Path Replacement (ANF-PR)

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	ETS 300 258 (ECMA-175)	N/A	- -
Stage 2	ETS 300 258 (ECMA-175)	N/A	- -
Stage 3Q (NOTE 4) (NOTE 7)	ETS 300 259 (ECMA-176)	- -	- -

A.9.6 ANF Route Restriction (ANF-RR)

Type: ANF Applicable to: Private ISDN

Table A.87: ANF Route Restriction (ANF-RR)

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00017 (ECMA-RRSD)	N/A	- -
Stage 2	DE/ECMA-00017 (ECMA-RRSD)	N/A	- -
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00056 (ECMA-QSIG-RR)	- -	- -

A.9.7 ANF Source Routing (ANF-SR)

Type: ANF Applicable to: Private ISDN

Table A.88: ANF Source Routing (ANF-SR)

Aspect	Base standard	Conformance test standard	Equivalent ITU-T Recommendation
Stage 1	DE/ECMA-00015 (ECMA-RISD)	N/A	- -
Stage 2	DE/ECMA-00015 (ECMA-RISD)	N/A	- -
Stage 3Q (NOTE 4) (NOTE 7)	DE/ECMA-00060 (ECMA-QSIG-SR)	- -	- -

Annex B: ISDN physical interfaces

B.1 Introduction

The tables contained in this annex list all the ETSs required for defining interfaces, for a number of transmission networks, independent of the telecommunications service.

The interfaces are defined in clause B.4 onwards. Each interface is described in a matrix. The rows define a particular layer, or aspect of a layer, in the ISDN protocol stack.

For each of these rows a column entry gives the relevant ETSs specifying the requirements, conformance testing and regulatory requirements. Each entry includes ETRs where relevant, and there is a column for the ITU-T Recommendations related to the requirement's ETS.

B.2 Identification of interfaces

Table B.1 gives an overview of the information within this annex. This matrix identifies the desired transmission network in the vertical direction. The horizontal entries define:

a) **Access interfaces:** the tables within annex B which define interfaces which may be used to access that transmission network;

b) **Interconnection interfaces:** the tables within annex B which define interfaces for interconnection of like transmission networks. This only covers the ISDN; all other interconnection interfaces are outside the scope of this ETR;

c) **Telecommunication services:** an identification of the services available from the transmission network using the identified interface.

Table B.1: Overview of interfaces

Transmission network	Access interfaces	Interconnection interfaces	Telecommunication services
ISDN (private or public)	Basic see subclause B.4.1	see subclause B.4.4	see annex A
	Primary rate see subclause B.4.2		
	Dedicated primary rate see subclause B.4.3		
Digital cross connect	2 048 kbit/s see clause B.5	Outside the scope of this ETR	circuit-mode 64 kbit/s digital unrestricted with 8 kHz integrity (permanent)
Transmission network providing ONP digital leased lines	64 kbit/s unrestricted with octet integrity see subclause B.6.1	Outside the scope of this ETR	circuit-mode 64 kbit/s digital unrestricted with 8 kHz integrity (permanent)
	2 048 kbit/s structured see subclause B.6.2	Outside the scope of this ETR	circuit-mode 1 984 kbit/s digital unrestricted unstructured with 8 kHz integrity (permanent)
	2 048 kbit/s unstructured see subclause B.6.3	Outside the scope of this ETR	circuit-mode 2 048 kbit/s digital unrestricted unstructured (permanent)

B.3 Notes to tables in annex B

The tables in annex B reference some notes contained in this subclause. These references are of the form "(NOTE x)". The notes are as follows:

NOTE 1: Where ETS 300 153 (NET 3 part 1) is cited as containing the regulatory requirements, it should be noted that this ETS will be replaced by TBR 003 when this is published.

NOTE 2: There are currently no ETSs specifying EMC requirements to be applied to this interface. However, generic EMC requirements contained in ENs supporting the EMC Directive (89/336/EEC) apply.

NOTE 3: ETS 300 402 is in progress to produce a revised standard covering both public ISDN access and private ISDN access and interconnection.

NOTE 4: Where ETS 300 104 (NET 3 part 2) is cited as containing the regulatory requirements, it should be noted that this ETS will be replaced by TBR 003 when this is published.

NOTE 5: Where ETS 300 156 (NET 5) is cited as containing the regulatory requirements, it should be noted that this ETS will be replaced by TBR 004 when this is published.

NOTE 6: ETR 012 gives guidance concerning safety categories and protection levels for telecommunications equipment in customer premises.

B.4 ISDN interfaces

B.4.1 Basic access

This covers the basic access for application at the T reference point, S reference point, and coincident S and T reference point.

B.4.1.1 Basic access layer 1

Table B.2: Layer 1 for public ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 012 Ed.1 ETS 300 012/A1 ETS 300 012/A2 ETS 300 012 Ed.2	ETS 300 012 Ed.1 ETS 300 012/A1 ETS 300 012/A2 ETS 300 012 Ed.2 ETR 085	ETS 300 153 ETS 300 153/A1 (NOTE 1)	I.430
Safety and protection (NOTE 6)	ETS 300 047-1 ETS 300 047-2 ETS 300 047-3 ETS 300 047-4 ETS 300 047-5	ETS 300 047-1 ETS 300 047-2 ETS 300 047-3 ETS 300 047-4 ETS 300 047-5	ETS 300 153 ETS 300 153/A1 (NOTE 1)	K.22
Maintenance	ETR 001	N/A	N/A	I.601 I.603
EMC	(NOTE 2)	- -	ETS 300 153 ETS 300 153/A1 (NOTE 1)	- -

Table B.3: Layer 1 for private ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 012 Ed.1 ETS 300 012/A1 ETS 300 012/A2 ETS 300 012 Ed.2	ETS 300 012 Ed.1 ETS 300 012/A1 ETS 300 012/A2 ETS 300 012 Ed.2 ETR 035 DE/TM-03016	N/A	I.430
Safety and protection (NOTE 6)	ETS 300 047-1 ETS 300 047-2 ETS 300 047-3 ETS 300 047-4 ETS 300 047-5	ETS 300 047-1 ETS 300 047-2 ETS 300 047-3 ETS 300 047-4 ETS 300 047-5	N/A	K.22
Maintenance	- -	N/A	N/A	I.601 I.603
EMC	(NOTE 2)	- -	N/A	- -

B.4.1.2 Basic access layer 2

Table B.4: Layer 2 (control plane) for public ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 125 I-ETS 300 305 I-ETS 300 307 ETS 300 402-1 ETS 300 402-2 ETS 300 402-3 ETS 300 402-4 (NOTE 3)	I-ETS 300 309 I-ETS 300 313 ETS 300 402-5 ETS 300 402-6 ETS 300 402-7 ETS 300 402-8 ETS 300 402-9	ETS 300 153 ETS 300 153/A1 (NOTE 1)	Q.920 Q.921 Q.921bis

Table B.5: Layer 2 (control plane) for private ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	I-ETS 300 169 (ECMA-105) (NOTE 3)	(NOTE 3)	N/A	Q.920 Q.921

B.4.1.3 Basic access signalling network application

Table B.6: Signalling network application (control plane) for public ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description - basic call	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 I-ETS 300 314 I-ETS 300 316 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485	I-ETS 300 318 I-ETS 300 322 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7	ETS 300 104 ETS 300 104/A1 (NOTE 4) (NOTE 7)	Q.931, Q.931bis
Description - generic mechanisms for supplementary services	ETS 300 122-1 ETS 300 122-1R1 ETS 300 122-2 ETS 300 122-2R1 ETS 300 196-1 ETS 300 196-1/A1 ETS 300 196-2	ETS 300 122-3 ETS 300 122-4 ETS 300 122-5 ETS 300 122-6 ETS 300 196-3 ETS 300 196-4 ETS 300 196-5 ETS 300 196-6	N/A	Q.932

Table B.7: Signalling network application (control plane) for private ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description - basic call	ETS 300 192 (ECMA-106) DE/ECMA-00025	- -	N/A	Q.931
Description - generic mechanisms for supplementary services	ETS 300 190 (ECMA-156) DE/ECMA-00026 ETS 300 240 (ECMA-161)	- -	N/A	Q.932

B.4.2 Primary rate access

This covers the primary rate access for application at the T reference point, S reference point, and coincident S and T reference point.

B.4.2.1 Primary rate access layer 1

Table B.8: Layer 1 for public ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 011 Ed.1 ETS 300 011/A1 ETS 300 011/A2 ETS 300 011 Ed.2	ETS 300 011 Ed.1 ETS 300 011/A1 ETS 300 011/A2 ETS 300 011 Ed.2 ETR 136	ETS 300 156 (NOTE 5)	I.431
Safety and protection (NOTE 6)	ETS 300 046-1 ETS 300 046-2 ETS 300 046-3 ETS 300 046-4 ETS 300 046-5	ETS 300 046-1 ETS 300 046-2 ETS 300 046-3 ETS 300 046-4 ETS 300 046-5	ETS 300 156 (NOTE 5)	K.22
Maintenance	- -	N/A	N/A	I.601, I.603
EMC	(NOTE 2)	- -	ETS 300 156 (NOTE 5)	- -

Table B.9: Layer 1 for private ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 011 Ed.1 ETS 300 011/A1 ETS 300 011/A2 ETS 300 011 Ed.2	ETS 300 011 Ed.1 ETS 300 011/A1 ETS 300 011/A2 ETS 300 011 Ed.2 ETR 136 DE/TM-03016	N/A	I.431
Safety and protection (NOTE 6)	ETS 300 046-1 ETS 300 046-2 ETS 300 046-3 ETS 300 046-4 ETS 300 046-5	ETS 300 046-1 ETS 300 046-2 ETS 300 046-3 ETS 300 046-4 ETS 300 046-5	N/A	K.22
Maintenance	- -	N/A	N/A	I.601, I.603
EMC	(NOTE 2)	- -	N/A	- -

B.4.2.2 Primary rate access layer 2

Table B.10: Layer 2 (control plane) for public ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 125 I-ETS 300 306 I-ETS 300 308 ETS 300 402-1 ETS 300 402-2 ETS 300 402-3 ETS 300 402-4 (NOTE 3)	I-ETS 300 310 I-ETS 300 313 I-ETS 300 312 ETS 300 402-5 ETS 300 402-6 ETS 300 402-7 ETS 300 402-8 ETS 300 402-9	ETS 300 156 (NOTE 5)	Q.920 Q.921 Q.921bis

Table B.11: Layer 2 (control plane) for private ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	I-ETS 300 169 (ECMA-105) (NOTE 3)	(NOTE 3)	N/A	Q.920 Q.921

B.4.2.3 Primary rate access signalling network application

Table B.12: Signalling network application (control plane) for public ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 102-1 ETS 300 102-1/A1 ETS 300 102-1/A2 ETS 300 102-2 I-ETS 300 315 I-ETS 300 317 ETS 300 403-1 ETS 300 403-2 ETS 300 403-3 ETS 300 485	I-ETS 300 319 I-ETS 300 322 I-ETS 300 321 ETS 300 403-4 ETS 300 403-5 ETS 300 403-6 ETS 300 403-7	ETS 300 156 (NOTE 5)	Q.931, Q.931bis
Description - generic mechanisms for supplementary services	ETS 300 122-1 Ed.1 ETS 300 122-1 Ed.2 ETS 300 122-2 Ed.1 ETS 300 122-2 Ed.2 ETS 300 196-1 ETS 300 196-1/A1 ETS 300 196-1/A2 ETS 300 196-2	ETS 300 122-3 ETS 300 122-4 ETS 300 122-5 ETS 300 122-6 ETS 300 196-3 ETS 300 196-4 ETS 300 196-5 ETS 300 196-6	N/A	Q.932

Table B.13: Signalling network application (control plane) for private ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description - basic call	ETS 300 192 (ECMA-106) DE/ECMA-00025	- -	N/A	Q.931
Description - generic mechanisms for supplementary services	ETS 300 190 (ECMA-156) DE/ECMA-00026 ETS 300 240 (ECMA-161)	- -	N/A	Q.932

B.4.3 Primary rate leased-line

This covers interfaces for application to the scenarios described in annex C.

Table B.14: Layer 1

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 011 annex A	ETS 300 011 annex A	- -	- -
Safety and protection (NOTE 6)	ETS 300 046-1 ETS 300 046-2 ETS 300 046-3 ETS 300 046-4 ETS 300 046-5	ETS 300 046-1 ETS 300 046-2 ETS 300 046-3 ETS 300 046-4 ETS 300 046-5	- -	K.22
Maintenance	- -	N/A	N/A	I.601, I.603
EMC	(NOTE 2)	- -	- -	- -

B.4.4 ISDN interconnection

This covers interfaces for application at the N reference point and at the Q reference point.

Table B.15: Interconnection interface (control plane) for public ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Message transfer part (MTP)	ETS 300 008 ETS 300 008/A1 ETS 300 008/A2 DE/SPS-02019 DE/SPS-02033	ETS 300 336 ETS 300 346 DE/SPS-02007 DE/SPS-02008 DE/SPS-02020	N/A	Q.701, Q.709
Signalling connection control part (SCCP)	ETS 300 009 Ed.2 ETS 300 009/E3	T/S 43-18 ETS 300 009 Ed.2 ETS 300 009/E3	N/A	Q.711, Q.714, Q.716
Integrated services user part (ISUP)	ETS 300 121 ETS 300 356-1 DE/SPS-6007-1	ETS 300 335 DE/SPS-6007-2 DE/SPS-6007-3	N/A	Q.767, Q.784, Q.785, Q.761, Q.762, Q.763, Q.764, Q.768
Transaction capabilities application part (TCAP)	ETS 300 134 ETS 300 287 Ed.1 ETS 300 439	ETS 300 344 ETS 300 287 Ed.1 DE/SPS-02014	N/A	- -

Table B.16: Interconnection interface (control plane) for private ISDN

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Layer 1	See annex C: Private ISDN network scenarios			
Layer 2	ETS 300 170 (ECMA-141)	DE/ECMA-00108-1 DE/ECMA-00108-2	N/A	Q.920 Q.921
Layer 3 - basic call	ETS 300 172 (ECMA-143 Ed.2) DE/ECMA-00044	DE/ECMA-00109-1 DE/ECMA-00109-2	N/A	Q.931, Q.931bis
Layer 3 - generic mechanisms for supplementary services	ETS 300 239 (ECMA-165)	DE/ECMA-00110	N/A	Q.932

B.5 Digital cross-connect network

This covers interfaces for application to the scenarios described in annex C.

Table B.17: Layer 1

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 010-1 Ed.1 ETS 300 010-1 Ed.2 ETS 300 010-1/A1 ETS 300 010-2	- -	- -	- -
Safety and protection (NOTE 6)	- -	- -	- -	- -
Maintenance	- -	N/A	N/A	- -
EMC	(NOTE 2)	- -	- -	- -

B.6 Transmission network providing ONP digital leased-lines

This covers interfaces for application to the scenarios described in annex C.

B.6.1 64 kbit/s unrestricted with octet integrity digital leased-line interface

Table B.18: Layer 1

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 288 ETS 300 290	ETS 300 288 ETS 300 290	ETS 300 288 TBR 014	G.703
Safety and protection	ETS 300 288 ETS 300 290	ETS 300 288 ETS 300 290	ETS 300 288 TBR 014	- -
Maintenance	- -	- -	- -	- -
EMC	ETS 300 288 ETS 300 290	ETS 300 288 ETS 300 290	ETS 300 288 TBR 014	- -

B.6.2 2 048 kbit/s structured digital leased-line interface

Table B.19: Layer 1

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 418 ETS 300 420	ETS 300 418 ETS 300 420	ETS 300 418 TBR 013	G.703
Safety and protection	ETS 300 418 ETS 300 420	ETS 300 418 ETS 300 420	ETS 300 418 TBR 013	- -
Maintenance	- -	- -	- -	- -
EMC	ETS 300 418 ETS 300 420	ETS 300 418 ETS 300 420	ETS 300 418 TBR 013	- -

B.6.3 2 048 kbit/s unstructured digital leased-line interface

Table B.20: Layer 1

Items	ETS/ETR	Conformance	Regulatory requirements	Related ITU-T Recommendation
Description	ETS 300 246 ETS 300 248	ETS 300 246 ETS 300 248	ETS 300 246 TBR 012	G.703
Safety and protection	ETS 300 246 ETS 300 248	ETS 300 246 ETS 300 248	ETS 300 246 TBR 012	- -
Maintenance	- -	- -	- -	- -
EMC	ETS 300 246 ETS 300 248	ETS 300 246 ETS 300 248	ETS 300 246 TBR 012	- -

Annex C: Private ISDN network scenarios

C.1 Introduction

The tables in this annex list the standards (or point to other tables listing standards) required to define overlay network scenarios for the interconnection of Private Telecommunication Network Exchanges (PTNXs) to construct private telecommunication networks (private ISDNs).

The scenario matrices appear in clauses C.4 onwards.

C.2 Notes to tables in annex C

The tables in annex C reference some notes contained in this sub-clause. These references are of the form "(NOTE x)". The notes are as follows:

NOTE 1: For the case where this bearer service intersects with the row for "ONP leased line", NOTE 2 below applies.

NOTE 2: No bearer service definition of the kind used for ISDN formally exists for this service. The description indicated is the best description available of the service offered. This service is only offered by a specific type of ONP leased line.

NOTE 3: No packet-mode user information connection types are currently specified.

NOTE 4: There are currently no signalling connection types specified for use by direct connection to X.25 PSPDN (i.e. ITU-T Recommendation X.32 and X.31 case A).

NOTE 5: There is currently no work item in the ETSI work programme for the development of a functional standard at the C reference point for the case where User signalling bearer service is used for signalling connections.

NOTE 6: The physical interface to be used in this scenario is left unspecified as it may vary from case to case. It can be selected from a number of possibilities, including primary rate leased line, ONP leased line, optical fibre, etc.

NOTE 7: When the UUS 3 supplementary service is used as a signalling connection it is in association with one of the bearer services used for the establishment of the user information connection(s).

C.3 Guide to network scenarios

Each network scenario is described in a scenario matrix. A network scenario is comprised of a combination of "Signalling Connections" (SC) and "User Information Connections" (UIC) provided via the infrastructure of public telecommunications networks, the "Intervening Network" (IVN). Further information on network scenarios and connections for interconnecting PTNXs can be found in ENV 41006 "Scenarios for interconnections between exchanges of private telecommunication networks" and TCR-TR 010 "Business Telecommunications (BT); Provision of connections for interconnecting Private Telecommunication Network Exchanges (PTNX)".

NOTE: ENV 41006 will be superseded by a new ETS entitled "Business TeleCommunications (BTC); PTN functional requirements; Part 3: Overlay scenarios - principles and classification". This ETS is currently being prepared by ETSI under work item DE/BTC-01028.

Various bearer services can be used as a basis for a signalling connection or a user information connection. Multiple combinations of these lead to many different types of network scenario. For simplification in this annex, tables are only given for scenarios where the Intervening Network type is the same for both signalling connection and user information connection. This does not, however, preclude other combinations from being offered by the public telecommunications network or from being used by private telecommunications network operators.

Table C.1 shows the bearer services that can be supported by different types of Intervening Network. Intervening network types are listed down the table and bearer services are listed across the table. For each bearer service, a reference is given in brackets to a table in annex A or annex B, where the definition of the service can be found.

Table C.1: Bearer services supported by different Intervening Networks

IVN type	**Bearer service type**								
	Circuit-mode 3,1 kHz audio (A.1)	Circuit-mode 64 kbit/s digital un-restricted with 8 kHz integrity (A.2) (NOTE 1)	Circuit-mode 1 984 kbit/s digital un-restricted unstruct. with 8 kHz integrity (B.19) (NOTE 2)	Circuit-mode 2 048 kbit/s digital un-restricted unstruct. (B.20) (NOTE 2)	Circuit-mode speech (A.3)	Frame-mode bearer service (A.5)	Multi-rate bearer service (A.4)	Packet-mode (X.31 case B) B- and D-channel (A.6)	User signalling bearer service (A.7)
Dedicated physical links	No	Yes	Yes	Yes	No	No	No	No	No
Primary rate leased line	Yes	Yes	Yes	Yes	Yes	No	No	No	No
ONP leased line	No	Yes (NOTE 2) (B.18)	Yes	Yes	No	No	No	No	No
Digital cross-connect	No	Yes	No	No	No	No	No	No	No
ISDN (circuit-mode)	Yes	Yes	No	No	Yes	No	Yes	Yes	No
ISDN (packet-mode)	No	No	No	No	No	Yes	No	Yes	No
ISDN with USBS	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
X.25 PSPDN	No	No	No	No	No	No	No	No	No

Tables C.2 and C.3 relate bearer service types to scenario connection types (signalling connection and user information connection types). For each bearer service, a reference is given in brackets to a table in annex A or annex B, where the definition of the service can be found.

Table C.2: Relation of bearer service types to signalling connection types

SC type	**Bearer service type**								
	Circuit-mode 3,1 kHz audio (A.1)	Circuit-mode 64 kbit/s digital un-restricted with 8 kHz integrity (A.2)	Circuit-mode 1 984 kbit/s digital un-restricted unstruct. with 8 kHz integrity (B.19) (NOTE 2)	Circuit-mode 2 048 kbit/s digital un-restricted unstruct. (B.20) (NOTE 2)	Circuit-mode speech (A.3)	Frame-mode bearer service (A.5)	Multi-rate bearer service (A.4)	Packet-mode (X.31 case B) B- and D-channel (A.6)	User signalling bearer service (A.7)
Circuit-mode dedicated	No	Yes	No	No	No	No	No	No	No
Circuit-mode semi-permanent	No	Yes	No	No	No	No	No	No	No
Circuit-mode switched	No	Yes	No	No	No	No	No	No	No
User signalling bearer service semi-permanent	No	No	No	No	No	No	No	No	Yes
User signalling bearer service switched	No	No	No	No	No	No	No	No	Yes
UUS service 3	No	No	No	No	No	No	No	No	No
PMBS X.31 case B semi-permanent	No	No	No	No	No	No	No	Yes	No
PMBS X.31 case B switched	No	No	No	No	No	No	No	Yes	No

Table C.3: Relation of bearer service types to user information connection types

UIC type (NOTE 3)	**Bearer service type**								
	Circuit-mode 3,1 kHz audio (A.1)	Circuit-mode 64 kbit/s digital un-restricted with 8 kHz integrity (A.2)	Circuit-mode 1 984 kbit/s digital un-restricted unstruct. with 8 kHz integrity (B.19) (NOTE 2)	Circuit-mode 2 048 kbit/s digital un-restricted unstruct. (B.20) (NOTE 2)	Circuit-mode speech (A.3)	Frame-mode bearer service (A.5) (NOTE 3)	Multi-rate bearer service (A.4) (NOTE 3)	Packet-mode (X.31 case B) B- and D-channel (A.6) (NOTE 3)	User signalling bearer service (A.7) (NOTE 3)
Dedicated circuit-mode	No	Yes	Yes	Yes	No	No	No	No	No
Semi-permanent circuit-mode	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Switched circuit-mode	Yes	Yes	Yes	Yes	Yes	No	No	No	No

Table C.4 points to the scenario matrices from the point of view of scenario connection types. For each combination of Intervening Network and connection type the table points to the relevant scenario matrix.

Each entry points to the relevant scenario matrix in clause C.4. Blank entries indicate combinations that cannot occur. References in brackets () indicate the relevant scenario class from ENV 41006.

Table C.4: Pointers to scenario matrices

Intervening network type:		Dedicated physical links	Primary rate leased line	ONP leased line	Digital cross-connect	ISDN (circuit-mode)	ISDN (packet-mode)	ISDN with USBS	X.25 PSPDN (NOTE 4)
SC type:	Circuit-mode dedicated	C.5 (1.1)	C.6 (1.2)	C.7 (1.2)					
	Circuit-mode semi-permanent				C.8 (1.2)	C.9 (2.1)			
	Circuit-mode switched					C.10 (3.1)			
	User signalling bearer service semi-permanent							C.14 (2.2)	
	User signalling bearer service switched							C.15 (3.2)	
	UUS service 3					C.11			
	PMBS X.31 case B semi-permanent						C.12 (2.3)		
	PMBS X.31 case B switched						C.13 (3.3)		
UIC type:	Dedicated circuit-mode	C.5 (1.1)	C.6 (1.2)	C.7 (1.2)					
	Semi-permanent circuit-mode				C.8 (1.2)	C.9 (2.1)	C.12 (2.3)	C.14 (2.2)	
	Switched circuit-mode					C.10 C.11 (2.1)	C.13 (2.3)	C.15 (3.2)	

C.4 Network scenarios

C.4.1 Explanation of tables in clause C.4

This clause contains the scenario matrices for the combinations of signalling connection type and user information connection type through various kinds of Intervening Network.

For the two classes of connection (signalling, and user information) a number of aspects are defined by the rows of the table. These aspects are:

Connection & control: the definition of service, switching and signalling capabilities for the exchange of information between a PTN and the public telecommunications network at the access to that network, to establish and control "signalling" and/or "user information" connections through the public telecommunications network.

Physical interface: the definition of the physical interface structure applicable at the C reference point.

Scenario control: the definition of switching and signalling capabilities for the exchange of "control" information between two PTNXs to manage inter-PTNX connections (e.g. to establish the distinction between signalling and user information connections, or to uniquely identify user information connections) prior to the use of such connections for PTN calls.

For each of these aspects there is a column entry containing relevant ETSs specifying the requirements. Alternatively, the entry contains a pointer to another relevant table elsewhere in this ETR. Similar columns specifying the relevant conformance test standard and regulatory requirements are also defined.

The remaining subclauses contain the scenario matrices themselves.

C.4.2 Dedicated physical link

Table C.5: Dedicated physical link scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	DE/BTC-01018		
	Physical interface	- - (NOTE 6)		
	Scenario control	- -	- -	- -
User information connection	Connection & control	DE/BTC-01018		
	Physical interface	- - (NOTE 6)		
	Scenario control	- -	- -	- -

C.4.3 Primary rate leased line

Table C.6: Primary Rate leased line scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	DE/BTC-01018		
	Physical interface	Primary rate leased line: see table B.14		
	Scenario control	- -	- -	- -
User information connection	Connection & control	DE/BTC-01018		
	Physical interface	Primary rate leased line: see table B.14		
	Scenario control	- -	- -	- -

C.4.4 ONP leased line

Table C.7: ONP leased line scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	64 kbit/s unstructured: ETS 300 289, DE/BTC-01018 2 048 kbit/s structured: DE/BTC-02022 2 048 kbit/s unstructured: ETS 300 247		
	Physical interface	64 kbit/s unstructured: see table B.18 2 048 kbit/s structured: see table B.19 2 048 kbit/s unstructured: see table B.20		
	Scenario control	- -	- -	- -
User information connection	Connection & control	64 kbit/s unstructured: ETS 300 289, DE/BTC-01018 2 048 kbit/s structured: DE/BTC-02022 2 048 kbit/s unstructured: ETS 300 247		
	Physical interface	64 kbit/s unstructured: see table B.18 2 048 kbit/s structured: see table B.19 2 048 kbit/s unstructured: see table B.20		
	Scenario control	- -	- -	- -

C.4.5 Digital cross-connect

Table C.8: Digital cross-connect scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	DE/BTC-01020		
	Physical interface	Digital cross connect: see table B.17		
	Scenario control	- -	- -	- -
User information connection	Connection & control	DE/BTC-01020		
	Physical interface	Digital cross connect: see table B.17		
	Scenario control	- -	- -	- -

C.4.6 ISDN (circuit-mode) semi-permanent

Table C.9: ISDN (circuit-mode) semi-permanent scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	Circuit-mode 64 kbit/s unrestricted: A.2 DE/BTC-01019		
	Physical interface	Basic user-network interfaces: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -
User information connection	Connection & control	Circuit-mode 3,1 kHz audio: see table A.1 Circuit-mode 64 kbit/s unrestricted: see table A.2 Circuit-mode speech: see table A.3 DE/BTC-01019		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -

C.4.7 ISDN (circuit-mode) switched

Table C.10: ISDN (circuit-mode) switched scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	Circuit-mode 64 kbit/s unrestricted: see table A.2 DE/BTC-01019 Basic user-network interfaces: see tables B.4 & B.6 Primary rate user-network interface: see tables B.10 & B.12		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interfaces: see table B.8		
	Scenario control	- -	- -	- -
User information connection	Connection & control	Circuit-mode 3,1 kHz audio: see table A.1 Circuit-mode 64 kbit/s unrestricted: see table A.2 Circuit-mode speech: see table A.3 DE/BTC-01019 Basic user-network interface: see tables B.4 & B.6 Primary rate user-network interface: see tables B.10 & B.12		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -

C.4.8 ISDN (circuit-mode) User-to-User Signalling service 3 (UUS3)

Table C.11: ISDN (circuit-mode) UUS 3 scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	User-to-User signalling: see table A.80 (NOTE 7) DE/BTC-01019 Basic user-network interface: see tables B.4 & B.6 Primary rate user-network interface: see table B.10 & B.12		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -
User information connection	Connection & control	Circuit-mode 3,1 kHz audio: see table A.1 Circuit-mode 64 kbit/s unrestricted: see table A.2 Circuit-mode speech: see table A.3 DE/BTC-01019 Basic user-network interface: see tables B.4 & B.6 Primary rate user-network interface: see table B.10 & B.12		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -

C.4.9 Packet-Mode Bearer Service (PMBS) X.31 case B semi-permanent

Table C.12: PMBS X.31 case B semi-permanent scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	Packet-mode (X.31 case B) B- and D- channel: see table A.6 DE/BTC-01021		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -
User information connection	Connection & control	Circuit-mode 3,1 kHz audio: see table A.1 Circuit-mode 64 kbit/s unrestricted: see table A.2 Circuit-mode speech: see table A.3 DE/BTC-01019		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -

C.4.10 Packet-Mode Bearer Service (PMBS) X.31 case B switched

Table C.13: PMBS X.31 case B switched scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	Packet-mode (X.31 case B) B- and D- channel: see table A.3.6 DE/BTC-01021 Basic user-network interface: see tables B.4 & B.6 Primary rate user-network interface: see tables B.10 & B.12		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -
User information connection	Connection & control	Circuit-mode 3,1 kHz audio: see table A.1 Circuit-mode 64 kbit/s unrestricted: see table A.2 Circuit-mode speech: see table A.3 DE/BTC-01019		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -

C.4.11 ISDN with User Signalling Bearer Service (USBS) semi-permanent

Table C.14: ISDN with USBS semi-permanent scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	User signalling bearer service: see table A.7 (NOTE 5)		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -
User information connection	Connection & control	Circuit-mode 3,1 kHz audio: see table A.1 Circuit-mode 64 kbit/s unrestricted: see table A.2 Circuit-mode speech: see table A.3 DE/BTC-01019		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -

C.4.12 ISDN with User Signalling Bearer Service (USBS) switched

Table C.15: ISDN with USBS switched scenario

Connection type	Aspect	Applicable table or base standard	Conformance test standard	Regulatory requirements
Signalling connection	Connection & control	User signalling bearer service: see table A.7 (NOTE 5) Basic user-network interface: see tables B.4 & B.6 Primary rate user-network interface: see tables B.10 & B.12		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -
User information connection	Connection & control	Circuit-mode 3,1 kHz audio: see table A.1 Circuit-mode 64 kbit/s unrestricted: see table A.2 Circuit-mode speech: see table A.3 DE/BTC-01019		
	Physical interface	Basic user-network interface: see table B.2 Primary rate user-network interface: see table B.8		
	Scenario control	- -	- -	- -

Annex D: Performance and network capabilities

D.1 Introduction

This annex on performance and network capabilities contains tables identifying ETSs and ETRs for public and private networks on routing, numbering and addressing, service interworking aspects, interworking aspects between terminals and networks, and interworking between networks.

Standards for performance aspects arising from specific interworking situations are referred to in the appropriate subclause describing the interworking situation.

D.2 Notes to tables in annex D

The tables in annex D reference some notes contained in this subclause. These references are of the form "(NOTE x)". The notes are as follows:

NOTE 1: ETSI has work items in progress (DE/BTC-01022, DE/BTC-01028, and DE/BTC-01023 respectively) for new ETSs to replace ENVs 41004, 41006, and 41007 respectively. CENELEC will be asked to withdraw each ENV as the relevant new ETS is published.

NOTE 2: These features are an integral part of basic call in private ISDNs.

D.3 Documents on general network capabilities

There are a number of documents of a general nature that cannot be logically allocated to tables in this ETR.

D.3.1 General documents for PTNs

A number of documents outline future work in the area of PTN standardisation. These are:

- TCR-TR 018 describing PTNs;
- TCR-TR 010 describing overlay scenarios of PTNs;
- DTR/BTC-01001 describing integrated scenarios of PTNs.

The general documents for PTNs include:

- DE/BTC-01023 defining the terminology used in PTN standards (this is a replacement for ENV 41007-1) and DE/BTC-01040;
- DE/BTC-01022 defining reference configurations for PTNs (this is a replacement for ENV 41004);
- DE/BTC-01025 identifying ITU-T Recommendations and standards from other bodies applicable to PTNs;
- DE/BTC-01028 describing general principles of overlay scenarios for interconnecting PTNXs (this is a replacement for ENV 41006);
- DE/BTC-01032 describing general principles of integrated scenarios for interconnecting PTNXs.

D.3.2 General documents for public ISDNs

General documents applicable to public ISDNs can be found in the I-series of ITU-T Recommendations.

D.4 Network performance and quality of service

D.4.1 Public ISDN

Table D.1: ETSs for public ISDN performance and quality of service

Item	ETS/ETR	Conformance requirement	Related ITU-T Recommendation
General aspects	ETR 003 RTR/NA-042102 ETR 044	N/A	
Network component performance	ETR 011		
Connection processing delays	DE/NA-042104	DE/NA-042115	I.352
Accessibility	ETS 300 251	DI/NA-042117	E.846
Retainability	DI/NA-042108	DI/NA-042118	E.850
QoS parameters for voice telephony	DTR/NA-049001		
Congestion management for ISDN frame relay services	DE/NA-023215		I.370

D.4.2 PTN

Table D.2: ETSs for private ISDN performance and quality of service

Item	ETS/ETR	Conformance requirement	Related ITU-T Recommendation
Transmission plan overall aspects	ETR 004	N/A	
PABX transmission characteristics	I-ETS 300 003 I-ETS 300 006 ETS 300 283 DE/BT-02048	- - DE/BT-02048	
Performance aspects of Packet mode services	- -	- -	
Performance aspects of Frame mode services	- -	- -	
Serveability	ETR 016	- -	

D.5 Numbering and addressing

Table D.3: ETSs for numbering and addressing

Item	ETS/ETR	Conformance requirement	Related ITU-T Recommendation
Public ISDN numbering and addressing	ETR 006	N/A	E.164, E.165
Numbering and addressing for X.31 services on the public ISDN	ETR 020	N/A	
Private ISDN numbering and addressing	ETS 300 189 (ECMA-155)	N/A	
Numbering plans for the interconnection of VPN and public networks	ETR 033	N/A	

D.6 Routeing

Table D.4: ETSs for routing

Item	ETS/ETR	Conformance requirement	Related ITU-T Recommendation
Routeing for the public ISDN (ISUP version 1 services)	ETS 300 100	N/A	E.170, I.132
Routeing for the public ISDN (ISUP version 2 services)	ETS 300 334	N/A	E.170, I.132
Routeing for the private ISDN	- -	- -	- -

D.7 Synchronisation

Table D.5: ETSs for synchronisation

Item	ETS/ETR	Conformance requirement	Related ITU-T Recommendation
Synchronisation for the private ISDN	- -	- -	- -

D.8 Terminal selection

Table D.6: ETSs for terminal selection

Item	ETS/ETR	Conformance requirement	Related ITU-T Recommendation
Terminal selection for the public ISDN	ETR 026	N/A	I.333
Terminal selection for the private ISDN	- -	N/A	I.333

D.9 Interworking

D.9.1 Interworking overview

There are three types of interworking, namely:

Service interworking: This involves interworking between two users having incompatible service capabilities (e.g. telefax group 4 and telefax group 3). In the simplest case service interworking occurs within a single network (ISDN); however, it can also occur at the boundary between two different types of network in conjunction with network interworking.

Network interworking: This occurs at an interface between two different types of network supporting the same or equivalent services.

Access interworking: This occurs where there is no direct access between a terminal equipment and the network to which it is connected. An example is the case where DECT is used as a replacement for the wired digital section between a terminal equipment and the public ISDN.

Table D.7 below provides an overview of interworking situations covered by this annex.

Table D.7: Interworking situations covered in annex D

Public ISDN	Interworking is implicit in normal operation of all services								
Private ISDN	Interworking is implicit in normal operation of all services	N/A							
B-ISDN	Network interworking (see D.4.x)	Network interworking (see D.4.x)	N/A						
CSPDN	Network interworking (see D.4.y)	Network interworking (see D.4.y)	Outside scope of this ETR	N/A					
PSTN	Network interworking (see D.4.2)	Network interworking (see D.4.3)	Outside scope of this ETR	Outside scope of this ETR	N/A				
EDCT	Network interworking (see D.4.4)	Network interworking (see D.4.4)	Outside scope of this ETR	Outside scope of this ETR	Outside scope of this ETR	N/A			
PSPDN	Access interworking (see D.4.5) Network interworking (see D.4.6)	Access interworking (see D.4.7) Network interworking (see D.4.8)	Outside scope of this ETR	Outside scope of this ETR	Outside scope of this ETR	Outside scope of this ETR	N/A		
DECT	Access interworking (see D.4.9)	Access interworking (see D.4.10)	Outside scope of this ETR	Outside scope of this ETR	Outside scope of this ETR	Outside scope of this ETR	Outside scope of this ETR	N/A	
Satellite	Access interworking (see D.4.11)	Access interworking (see D.4.12)	Outside scope of this ETR	Outside scope of this ETR	Outside scope of this ETR	Outside scope of this ETR	Outside scope of this ETR	Outside scope of this ETR	N/A
Network type	**Public ISDN**	**Private ISDN**	**B-ISDN**	**CSPDN**	**PSTN**	**EDCT**	**PSPDN**	**DECT**	**Satellite**

D.9.2 Public ISDN - Public ISDN interworking

ETR 031 provides information on network aspects of ISDN to ISDN and ISDN internal interworking.

D.9.3 Public ISDN - B-ISDN interworking

DTR/NA-052102 covers the general requirements for interworking between B-ISDN and other networks.

DE/SPS-01013 covers signalling interworking between BISUP Release 1 and NISUP V2.

D.9.4 Private ISDN - B-ISDN interworking

DTR/BT-04002 will cover aspects of operations and interconnections for private broadband networks, including interworking aspects with existing private ISDNs.

DTR/NA-052102 covers the general requirements for interworking between B-ISDN and other networks.

D.9.5 Public ISDN - private ISDN interworking

D.9.5.1 Service interworking

All stage 1 descriptions for the public ISDN supplementary services listed in annex A contain a subclause (7.2) specifying interworking of the service with a private ISDN. Additionally, the documents listed in table D.8 below apply. The correspondence of public ISDN and private ISDN services is fully shown in annex A.

Table D.8: Public/private ISDN service interworking

Item	ETS/ETR	Conformance requirement	Related ITU-T Recommendation
Interworking of public ISDN services	ETS 300 345 ETR 030	N/A	- -
Interactions of private ISDN supplementary services	ETS 300 427	- -	- -
Frame relay services in PTNs and interworking with public networks providing the same type of services	DTR/BTC-04003	- -	- -

D.9.5.2 Network interworking

The following specific documents are relevant:

- ETR 045 on the general configuration and basic functions for the interconnection of private ISDNs with the public ISDN;

- ETS 300 283 on the planning of loudness rating and echo values for private ISDNs digitally connected to the public network.

D.9.6 Public ISDN - CSPDN interworking

ETR 030 describes general aspects of interworking.

D.9.7 Public ISDN - PSTN interworking

D.9.7.1 Service interworking

The basic service provided by the PSTN is equivalent to the circuit-mode 3,1 kHz audio bearer service category (see table A.1) Interworking of this service is described in the stage 1 description (ETS 300 110).

All stage 1 descriptions for the public ISDN supplementary services listed in annex A contain a subclause (7.1) specifying interworking of the service with the PSTN.

Historically, ETSI has not provided specifications for PSTN supplementary services although a number are now being developed. The equivalence between supplementary services for the public ISDN and supplementary services for the PSTN is as shown in table D.9 below.

Table D.9: Service equivalence between public ISDN and PSTN

PSTN service	ETS/ETR	Public ISDN service	ETS/ETR
Calling line identification presentation (analogue)	DE/NA-010023	Calling line identification presentation	ETS 300 089
Calling line identification restriction (analogue)	DE/NA-010024	Calling line identification restriction	ETS 300 090
Automatic reverse charging	DE/NA-010025	Unconditional reverse charging	DE/NA-010017

Additionally, the documents listed in table D.10 below apply.

Table D.10: Public ISDN - PSTN service interworking

Item	ETS/ETR	Conformance requirement	Related ITU-T Recommendation
Interworking between telefax group 4 and telefax group 3	ETR 030	N/A	- -

D.9.7.2 Network interworking

The following specific documents are relevant:

- ETS 300 343 is the signalling interworking specification for ISDN User Part (ISUP) version 1;
- ETS 300 360 specifies the interworking between ISUP version 2 and previous signalling systems (eg ISUP version 1, CCITT No 5, R2, TUP).

D.9.8 Private ISDN - PSTN interworking

D.9.8.1 Service interworking

The basic service provided by the PSTN is equivalent to the circuit-mode 3,1 kHz audio bearer service category (see table A.1) Interworking of this service is described in the stage 1 description (ETS 300 171).

All stage 1 descriptions for private ISDN supplementary services listed in annex A contain a subclause (7.1) specifying interworking of the service with the PSTN.

Historically, ETSI has not provided specifications for PSTN supplementary services although a number are now being developed. The equivalence between supplementary services for private ISDNs and supplementary services for the PSTN is as shown in table D.11 below.

Table D.11: Service equivalence between private ISDN and PSTN

PSTN service	ETS/ETR	Public ISDN service	ETS/ETR
Calling line identification presentation (analogue)	DE/NA-010023	Calling line pdentification presentation	ETS 300 173
Calling line identification restriction (analogue)	DE/NA-010024	Calling line identification restriction	ETS 300 173

Additionally, the documents listed in table D.12 below apply.

Table D.12: Private ISDN - PSTN service interworking

Item	ETS/ETR	Conformance requirement	Related ITU-T Recommendation
Interworking between telefax group 4 and telefax group 3	ETR 030	N/A	- -

D.9.8.2 Network interworking

No specific documents apply.

D.9.9 Public ISDN - EDCT interworking

D.9.9.1 General

The European Digital Cellular Telecommunications (EDCT) system is also known as the Global System for Mobile communications (GSM), or the Public Land Mobile Network (PLMN).

General network interworking scenarios for EDCT are described in DTS/SMG-030901 (phase 1) and ETR 109 (phase 2).

General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) are specified in DTS/SMG-040907 (phase 1) and ETS 300 604 (phase 2).

Interworking covers two cases; firstly, service interworking between services in GSM and services in ISDN, and secondly, the interworking of two mobile networks via ISDN. The tables in the following subclauses are only concerned with the first case.

D.9.9.2 Service interworking

Tables D.13 to D.15 below show the equivalence between services in public ISDN and services in EDCT. The tables correspond to the phased introduction (phase 1, phase 2, and phase 2+) of EDCT services.

Table D.13: Equivalence between phase 1 EDCT and public ISDN services

EDCT service	EDCT service description	Public ISDN service	Public ISDN service description
Barring of outgoing calls	DTS/SMG-010282	Fixed outgoing call barring User controlled outgoing call barring	DE/NA-010006 DE/NA-010022
Call forwarding mobile subscriber busy	DTS/SMG-010282	Call forwarding busy	ETS 300 199
Call forwarding no reply	DTS/SMG-010282	Call forwarding no reply	ETS 300 201
Call forwarding unconditional	DTS/SMG-010282	Call forwarding unconditional	ETS 300 200
Emergency call	DTS/SMG-010203	Telephony 3,1 kHz	ETS 300 111
Telephony	DTS/SMG-010203	Telephony 3,1 kHz	ETS 300 111
Unrestricted digital information bearer services	DTS/SMG-010202	No direct equivalence. Some applications of circuit-mode unrestricted digital information using ETS 300 103 may interwork.	ETS 300 108

Table D.14: Equivalence between phase 2 EDCT and public ISDN services

EDCT service	EDCT service description	Public ISDN service	Public ISDN service description
Advice of charge (information)	ETS 300 519	Advice of charge - during the call	ETS 300 179
Barring of outgoing calls	ETS 300 520	Fixed outgoing call barring User controlled outgoing call barring	DE/NA-010006 DE/NA-010022
Call forwarding mobile subscriber busy	ETS 300 515	Call forwarding busy	ETS 300 199
Call forwarding no reply	ETS 300 515	Call forwarding no reply	ETS 300 201
Call forwarding unconditional	ETS 300 515	Call forwarding unconditional	ETS 300 200
Call hold	ETS 300 516	Call hold	ETS 300 139
Call waiting	ETS 300 516	Call waiting	ETS 300 056
Calling line identification presentation	ETS 300 514	Calling line identification presentation	ETS 300 089
Calling line identification restriction	ETS 300 514	Calling line identification restriction	ETS 300 090
Closed user group	ETS 300 518	Closed user group	ETS 300 136
Connected line identification presentation	ETS 300 514	Connected line identification presentation	ETS 300 094
Connected line identification restriction	ETS 300 514	Connected line identification restriction	ETS 300 095
Emergency call	ETS 300 502	Telephony 3,1 kHz	ETS 300 111
Multiparty	ETS 300 517	Conference call, add-on	ETS 300 183
Telephony	ETS 300 502	Telephony 3,1 kHz	ETS 300 111
Unrestricted digital information bearer services	ETS 300 501	No direct equivalence. Some applications of circuit-mode unrestricted digital information using ETS 300 110 may interwork.	ETS 300 108

Table D.15: Equivalence between phase 2+ EDCT and public ISDN services

EDCT service	EDCT service description	Public ISDN service	Public ISDN service description
Call deflection	DE/SMG-010272Q	Call deflection	ETS 300 202
Call transfer	DE/SMG-010291Q	Explicit call transfer	ETS 300 357
Completion of calls to busy subscriber	DE/SMG-010293Q	Completion of calls to busy subscriber	ETS 300 357
Completion of calls to subscriber when no reply	DE/SMG-010293-3Q	Completion of calls on no reply	DE/NA-010027
Malicious call identification	DE/SMG-010273Q	Malicious call identification	ETS 300 128
Mobile access hunting	DE/SMG-010294Q	Line and trunk hunting	DE/NA-010003
Multiple subscriber number	DE/SMG-010297Q	Multiple subscriber number	ETS 300 050
Premium rate	DE/SMG-010236Q	Premium rate	DE/NA-010014
Private numbering plan	DE/SMG-010295Q	Support of private number plan	DE/NA-010004
Universal access to freephone numbers	DE/SMG-010235Q	Freephone	ETS 300 205
User-to-user signalling	DE/SMG-010287Q	User-to-user signalling	ETS 300 284

D.9.9.3 Network interworking

In addition to the general documents listed in subclause D.9.9.1, the following documents are relevant to network interworking:

- ETS 300 303 Integrated Services Digital Network (ISDN); ISDN - Global System for Mobile communications (GSM) Public Land Mobile Network (PLMN) signalling interface. ETS 300 482 provides conformance testing for this ETS;

- ETS 300 600 (GSM 09.03) European digital cellular telecommunications system (Phase 2); Signalling requirements on interworking between the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) and the Public Land Mobile Network (PLMN);

- DTS/SMG-030903 (phase 1) and ETS 300 603 (phase 2) describe interworking between a Public Land Mobile Network (PLMN) and a Packet Switched Public Data Network/Integrated Services Digital Network (PSPDN/ISDN) for the support of packet switched data transmission services;

- ETR 110 (GSM 09.09) European digital cellular telecommunications system; Detailed Signalling Interworking within the PLMN and with the PSTN/ISDN.

D.9.10 Private ISDN - EDCT interworking

D.9.10.1 General

The European Digital Cellular Telecommunications (EDCT) system is also known as the Global System for Mobile communications (GSM), or the Public Land Mobile Network (PLMN).

General network interworking scenarios for EDCT are described in ETR 109 (GSM 09.01).

General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) are specified in ETS 300 604 (GSM 09.07).

D.9.10.2 Service interworking

Tables D.16 to D.18 below show the equivalence between services in public ISDN and services in EDCT. The tables correspond to the phased introduction (phase 1, phase 2, and phase 2+) of EDCT services.

Table D.16: Equivalence between phase 1 EDCT and private ISDN services

EDCT service	EDCT service description	Private ISDN service	Private ISDN service description
Call forwarding mobile subscriber busy	DTS/SMG-010282	Call forwarding busy	ETS 300 156
Call forwarding no reply	DTS/SMG-010282	Call forwarding no reply	ETS 300 256
Call forwarding unconditional	DTS/SMG-010282	Call forwarding unconditional	ETS 300 256
Emergency call	DTS/SMG-010203	Telephony 3,1 kHz	ETS 300 171
Telephony	DTS/SMG-010203	Telephony 3,1 kHz	ETS 300 171
Unrestricted digital information bearer services	DTS/SMG-010202	No direct equivalence. Some applications of circuit-mode unrestricted digital information using ETS 300 103 may interwork.	ETS 300 171

Table D.17: Equivalence between phase 2 EDCT and private ISDN services

EDCT service	EDCT service description	Private ISDN service	Private ISDN service description
Advice of charge (information)	ETS 300 519	Advice of charge - during the call	DE/ECMA-00009
Call forwarding mobile subscriber busy	ETS 300 515	Call forwarding busy	ETS 300 171
Call forwarding no reply	ETS 300 515	Call forwarding no reply	ETS 300 171
Call forwarding unconditional	ETS 300 515	Call forwarding unconditional	ETS 300 171
Calling line identification presentation	ETS 300 514	Calling line identification presentation	ETS 300 173
Calling line identification restriction	ETS 300 514	Calling line identification restriction	ETS 300 173
Connected line identification presentation	ETS 300 514	Connected line identification presentation	ETS 300 173
Connected line identification restriction	ETS 300 514	Connected line identification restriction	ETS 300 173
Emergency call	ETS 300 502	Telephony 3,1 kHz	ETS 300 171
Telephony	ETS 300 502	Telephony 3,1 kHz	ETS 300 171
Unrestricted digital information bearer services	ETS 300 501	No direct equivalence. Some applications of circuit-mode unrestricted digital information using ETS 300 110 may interwork.	ETS 300 171

Table D.18: Equivalence between phase 2+ EDCTand private ISDN services

EDCT service	EDCT service description	Private ISDN service	Private ISDN service description
Call deflection	DE/SMG-010272Q	Call deflection	ETS 300 256
User-to-user signalling	DE/SMG-010287Q	User-to-user signalling	DE/ECMA-00021
Call transfer	DE/SMG-010291Q	Explicit call transfer	ETS 300 260
Completion of calls to subscriber when no reply	DE/SMG-010293-3Q	Completion of calls on no reply	ETS 300 365
Completion of calls to busy subscriber	DE/SMG-010293Q	Completion of calls to busy subscriber	ETS 300 365
Mobile access hunting	DE/SMG-010294Q	Basic call (NOTE 2)	N/A
Private numbering plan	DE/SMG-010295Q	Basic call (NOTE 2)	N/A
Multiple subscriber number	DE/SMG-010297Q	Basic call (NOTE 2)	N/A

D.9.10.3 Network interworking

See subclause D.9.9.3 above.

D.9.11 Public ISDN - PSPDN interworking

D.9.11.1 Network interworking

ETS 300 099 and DE/NA-023206 define a network-internal interface for the provision of ISDN packet-mode services.

ETS 300 458 defines a network internal interface for the provision of the ISDN frame mode bearer service.

D.9.11.2 Service interworking

ETR 030 describes general aspects of interworking for the teletex service.

D.9.12 Private ISDN - PSPDN interworking

D.9.12.1 Network interworking

No specific document exists, but some of the considerations contained in ETR 030 may be relevant.

D.9.12.2 Private ISDN - PSPDN interworking - network aspects

To be completed.

D.9.13 Public ISDN - DECT interworking

In general, services are provided transparently through the DECT system; therefore ISDN services are available to the user unchanged.

The following specific documents are relevant:

- ETR 041 Transmission and Multiplexing (TM); Digital European Cordless Telecommunications (DECT); Transmission aspects 3,1 kHz telephony Interworking with other networks;

- DE/RES-03018 DECT/ISDN interworking profile test specification;

- DE/RES-03023 Generic Access Profile (GAP);

- ETS 300 434-1 Digital European Cordless Telecommunications (DECT); DECT-ISDN interworking profile; Part 1: End system description;

- ETS 300 434-2 Digital European Cordless Telecommunications (DECT); DECT-ISDN interworking profile; Part 2: ISDN access profile end-system;

- DE/RES-03039-1 Digital European Cordless Telecommunications (DECT); DECT-ISDN interworking profile; Part 3: Intermediate system description;

- DE/RES-03039-2 Digital European Cordless Telecommunications (DECT); DECT-ISDN interworking profile; Part 4: ISDN access profile intermediate system.

D.9.14 Private ISDN - DECT interworking

In general, services are provided transparently through the DECT system; therefore ISDN services are available to the user unchanged. See those documents listed in subclause D.19.13.

D.9.15 Public/Private ISDN - satellite interworking

In general, services are provided transparently through satellite systems; therefore ISDN services are available to the user unchanged.

Satellite compatibility issues are either adequately catered for by ISDN standards, or will be taken into account in the near future by relevant Technical Committees of ETSI. The following areas of study exist at present:

- Packet-mode bearer services (NA2 responsible);

- SS7 Message Transfer Part (MTP) (SPS2 responsible);

- D-channel signalling protocols for layer 2 (SPS5 responsible);

- Low layer protocols for telematic terminals (TE2 responsible);

- Signalling for private ISDNs (BTC responsible, origin ECMA).

The following specific documents are also relevant:

- ETS 300 193 covers the general requirements for the connection of Very Small Aperture Terminals (VSAT) systems to terrestrial networks;

- ETR 163 and DE/SES-02015 cover the interconnection of VSAT systems to ISDN.

D.9.16 Public ISDN - telex interworking

ETR 030 describes general aspects of interworking.

Annex E: Terminal interchangeability

E.1 Definition

The ability of a Terminal Equipment (TE) to be attached to any two network(s) accesses, A and B, if at least one interface of the terminal equipment, and all interface and network access related functions, can satisfy the functional requirements, or a subset of, applicable to network access A and the functional requirements, or a subset of, applicable to network access B, with minimal modification or re-configuration.

A functional subset of a standard provides a particular set of functions (e.g. call answering capabilities on terminal equipment). It shall be sufficient for a terminal equipment or network access to conform to functional subsets only.

Minimal modification or re-configuration is that amount of modification or re-configuration that could be expected to be performed by an unskilled user of that piece of terminal equipment. It therefore includes the possibility of software and hardware modifications simply implementable by unskilled users, but excludes re-configurations or modifications that would normally be performed by the terminal equipment supplier.

NOTE: The definition given above does not consider administrative and regulatory aspects pertinent to individual networks. In addition, the actual connection of a terminal to a network may require the action of the network operator, e.g. allocation of terminal identification, subscription to the relevant service, etc.

Further to the definition, in the ISDN environment, the network accesses are the terminal-to-public-ISDN accesses at the coincident S and T reference point and the terminal-to-private-ISDN accesses at the S reference point.

Terminal interchangeability can be achieved, even if constrained to certain bearer services and/or teleservices and/or supplementary services. This depends upon the ability of the terminals and networks to provide the functions necessary to support those services. It therefore requires both the terminal and the network to provide, and to conform to, the functions standardised for the support of these services.

Terminals are expected to be interchanged between network(s) accesses that do not support particular bearer services, teleservices or supplementary services in a standardised manner. The user shall be able to determine which services are or are not supported when the terminal equipment is used on a particular network access.

E.2 Purpose

The ISDN provides a standard set of interfaces and services. The ISDN MoU defines a basic kernel set of ISDN service which all public ISDNs are expected to provide. It also allows for additional services to be provided as options. However, when these optional services are provided, they shall be provided in the standardised manner [1)]. Thus when a terminal equipment is connected to an ISDN network access any service which is:

a) provided by the network; and,
b) provided by the terminal equipment,

it will operate correctly.

The only reason why a service will not operate is if either:

a) the service is not provided by the network; or,
b) the service is not provided by the terminal equipment.

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1) Any network operator/terminal provider may provide non-standardised services (and this is expected to be the norm in the early stages of ISDN implementation). However, Terminal Interchangeability cannot provide the user with a guaranteed operation of these non-standardised services.

A terminal equipment which supports standardised services may therefore be connected to any ISDN (public or private) at the access points X1, X2, X3 or X4 of figure E.1.

Terminal interchangeability includes interchanging terminal equipments between two accesses:

1) on one public network;
2) on two different public networks;
3) on one private network;
4) on two different private networks;
5) one on a public network and one on a private network.

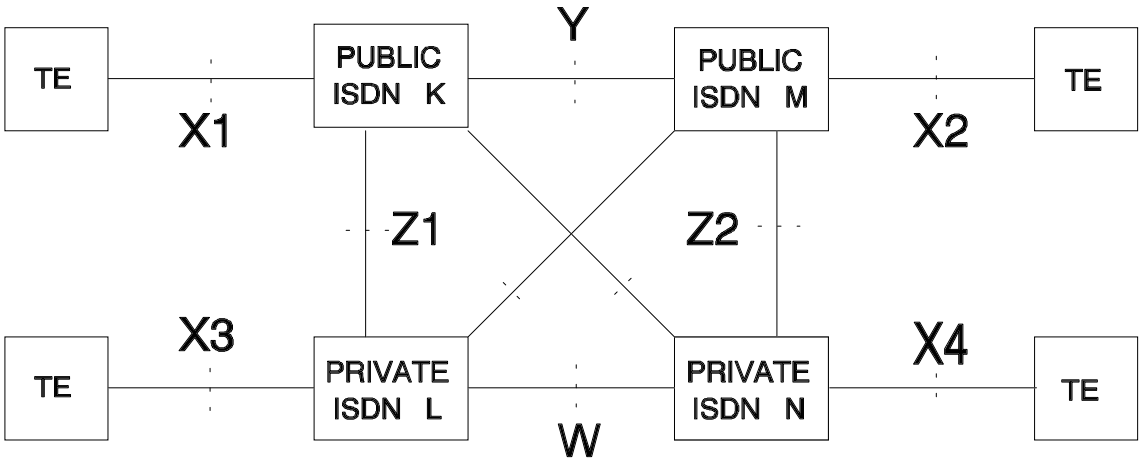

Figure E.1 [2]**: Access and interconnection points in ISDN concept**

E.3 Achieving terminal interchangeability in the standardisation process

Practical terminal interchangeability requires that the standards defining the services of the ISDN are written in a manner which prevents deliberate (or accidental) selection of options within a standard which will prevent two implementations of a service, each of which conform to the standard, failing to interwork.

However, the definition should not prevent terminal equipment or network suppliers from choosing to support only a limited set of the options of a service.

Terminal interchangeability is prevented by ambiguity within standards.

In order to create apparatus that will allow terminal interchangeability, it is necessary for terminal and network equipment suppliers that:

1) all parts of standards related to network accesses and services be written in a manner that prevents misinterpretation and unintentional equipment differences;

2) all optional parts of standards related to network accesses and services be clearly identified as options, when they will affect the ability of terminals to be interchangeable or the network to support interchangeable terminal equipment;

3) on the basis of the options identified within the standard, the network operators explicitly define which options they support at which time and, when more than one option supported, how the options are defined. This will provide a "profile" of the network accesses and services;

---

2) The interconnections W, Y and Z of figure D.1 are not relevant to the subject of terminal interchangeability.
Standardisation of the services and interfaces at point W is the subject of work currently being undertaken by ECMA. Standardisation of the interface at point Y is the subject of work currently being undertaken by ETSI.
The public ISDN access points Z1 and Z2 may be different to the access points X1 and X2. Standardisation of the interfaces and services at the access points Z1 and Z2 would allow for ISPBX interchangeability. It is assumed that an unskilled user would not perform the reconfigurations or modifications necessary to achieve ISPBX interchangeability.

4) on the basis of the options identified within the standards, terminal manufacturers explicitly define which options they support and, when more than one option is supported, how the options are to be used. This will provide a "profile" of the terminal equipment in respect of all standards supported.

The users/purchasers of terminal equipment can then use the "profiles" of the terminal equipment and of the network(s) accesses to determine whether a satisfactory level of terminal interchangeability can be achieved.

When creating Protocol Implementation Conformance Specifications (PICS) proformas for an existing standard, the revised standard shall identify the obvious and hidden options.

Annex F: Principles for standardisation alignment between public & private ISDNs

Joint ITAEGT (Information Technology Advisory Expert Group for private Telecommunications) and ISM (ISDN Standards Management) statement

ITAEGT and ISM have considered, in particular, the need for common service descriptions for public and private ISDN. Already ISM has produced stage 1 service descriptions, taking into account requirements form private ISDNs (presented by ECMA and ETSI TC-BTC). As a general aim, a single service description document covering both public and private ISDNs is desirable.

To enhance the aim of producing a single service description document, there should be a single base standard and with conformance statements for both the public and private ISDNs.

It is further considered that this aim should be applied to all the standards being produced for public and private ISDNs. However, the time constraints of both the ISM and ITAEGT programmes of work made this difficult in the short term, but this should not constrain the long term aims.

Therefore, ITAEGT and ISM recommend that the following principles should be adopted for future standardisation activities in the areas of public and private ISDNs:

1) Where European Standards for corresponding services are being developed concurrently in the public and private ISDN domain, the standardisation bodies concerned declare:

   - that, while recognising that some differences in the standards may be essential, unnecessary differences shall be avoided;

   - a common format and layout should be used for both public and private network standards;

   - there shall be, following ITAEGT procedures, a timely exchange of information;

   - European ISDN Standards should indicate the differences between public and private applications.

2) Where a European Standard exists for a service for the public ISDN but not for the private ISDN, and it is decided to develop a standard for the private ISDN, the public ISDN standard shall form the core for a common ISDN standard, so that the user's perception of the service shall be kept the same as far as possible.

   Necessary differences between the requirements of public and private networks shall be explicitly indicated by conformance statements.

3) Where a European Standard exists for a service for the private ISDN but not for the public ISDN, and it is decided to develop a standard for the public ISDN, the private ISDN standard shall form the core for a common ISDN standard, so that the user's perception of the service shall be kept the same as far as possible.

   Necessary differences between the requirements of public and private networks shall be explicitly indicated by conformance statements.

4) Coordination is required to prevent unnecessary duplication of the development of standards.

5) It should be noted that it is possible that some standards and services may only be applicable to either public ISDNs or private ISDNs. When separate, standalone documents are necessary, then those parts of the two specifications which are the same should be identical; i.e. rewriting of a section using different words or a different format for whatever reason should be avoided.

History

Document history		
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