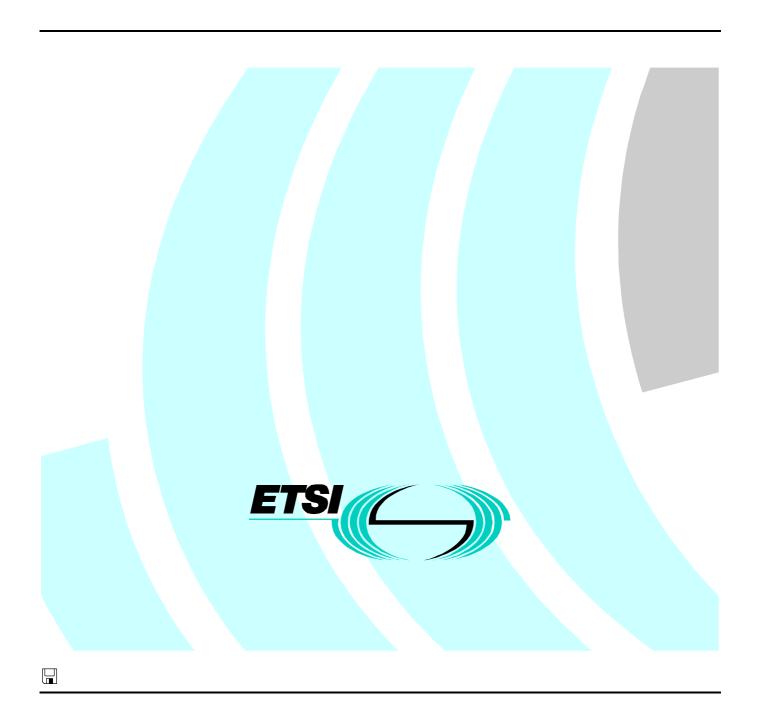Draft **ETSI EN 301 799-4** V1.1.1 (2001-02)

European Standard (Telecommunications series)

Integrated Services Digital User (ISDN); Remote Control (RC) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 4: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user

ETSI

Reference
DEN/SPAN-130117-4

Keywords
ISDN, DSS1, supplementary service, RC, ATS,
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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN), and is now submitted for the Public Enquiry phase of the ETSI standards Two-step Approval Procedure.

The present document is part 4 of a multi-part deliverable covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Remote Control supplementary service, as described below:

Part 1:   "Functional protocol specification";

Part 2:   "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3:   "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 4:   "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";

Part 5:   "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";

Part 6:   "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

1 Scope

This fourth part of EN 301 799 specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the User side of the T reference point or coincident S and T reference point of implementations conforming to the stage three standard for the Remote Control supplementary service for the pan-European Integrated Services Digital Network (ISDN) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol, EN 301 799-1 [1].

EN 301 799-5 [9] specifies the Test Suite Structure and Test Purposes (TSS&TP) related to this ATS and partial PIXIT proforma specification. Other parts specify the TSS&TP and the ATS and partial PIXIT proforma for the User side of the T reference point or coincident S and T reference point of implementations conforming to EN 301 799-1 [1].

2 References

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

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

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

- For a non-specific reference, subsequent revisions do apply.

[1]   ETSI EN 301 799-1 (V1.1.1): "Integrated Services Digital Network (ISDN); Remote Control (RC) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Functional protocol specification".

[2]   ETSI EN 301 799-2 (V1.1.1): "Integrated Services Digital Network (ISDN); Remote Control (RC) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[3]   ETSI EN 301 799-3 (V1.1.1): "Integrated Services Digital Network (ISDN); Remote Control (RC) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification for the user".

[4]   ISO/IEC 9646 (all parts): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework".

[5]   ETSI TR 101 666: "Information technology Open Systems Interconnection Conformance testing methodology and framework; The Tree and Tabular Combined Notation (TTCN) (Ed. 2++)".

[6]   ISO/IEC 8825-1: "Information technology - Encoding Rules for Abstract Syntax Notation One (ASN.1) - Part 1: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)" (See also ITU-T Recommendation X.690): 1994.

[7]   ETSI TR 101 101: "Methods for Testing and Specification (MTS); TTCN interim version including ASN.1 1994 support [ISO/IEC 9646-3] (Second Edition Mock-up for JTC1/SC21 Review)".

[8]   ETSI EN 301 264: "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Advice of Charge (AoC) supplementary services [ISO/IEC 15050 (1997), modified]".

[9]   ETSI EN 301 799-5: "Integrated Services Digital Network (ISDN); Remote Control (RC) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 5: Test Suite Structure and Test Purposes (TSS&TP) specification for the network".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646 [4] shall apply.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ASP	Abstract Service Primitive
ATM	Abstract Test Method
ATS	Abstract Test Suite
BER	Basic Encoding Rules
CM	Co-ordination Message
ETS	Executable Test Suite
ExTS	Executable Test Suite
FIE	Facility Information Element
IUT	Implementation Under Test
LT	Lower Tester
MOT	Means Of Testing
MTC	Main Test Component
PCO	Point of Control and Observation
PCTR	Protocol Conformance Test Report
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PTC	Parallel Test Component
RC	Remote Control
SUT	System Under Test
TCP	Test Co-ordination Procedures
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

4   Abstract Test Method

A Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3 in the test system. This PCO is named "L" (for Lower). The L PCO is used to control and observe the behaviour of the Implementation Under Test (IUT) and test case verdicts are assigned depending on the behaviour observed at this PCO.

A second "informal" PCO, called "O" (for Operator) is used to specify control but not observation above the IUT; events at this PCO are never used to generate test case verdicts. Messages sent by the tester at this PCO explicitly indicate to the operator actions which are to be performed on the SUT. This is regarded as a preferred alternative to the use of the implicit send event.

Figure 1: Remote test method with PCO O for test co-ordination

5   Untestable test purposes

There are no untestable test cases associated with this ATS and ATM.

# 6	ATS conventions

## 6.1	Version of TTCN used

The version of TTCN used is that defined in TR 101 666 [5].

## 6.2	Use of ASN.1

### 6.2.1	Situations where ASN.1 is used

ASN.1 has been used for three major reasons. First, types defined in ASN.1 can model problems that "pure" TTCN cannot. For instance, data structures modelling ordered or unordered sequences of data are preferably defined in ASN.1. Second, ASN.1 provides a better restriction mechanism for type definitions by using sub-type definitions. Third, it is necessary to use ASN.1 to reproduce the type definitions for remote operation components as specified in the base standards in ASN.1.

The possibility to use TTCN and ASN.1 in combination is used, i.e. referring to an ASN.1 type from a TTCN type.

### 6.2.2	Specification of encoding rules

There is a variation in the encoding rules applied to ASN.1 types and constraints specified in this ATS and therefore a mechanism is needed to differentiate the encoding rules. However the mechanism specified in ISO/IEC 9646-3/AM2 [4] and in TR 101 101 [7] does not facilitate definition of the encoding rules as needed for this ATS. A solution is therefore used which is broadly in the spirit of ISOIEC 9646-3/AM2 [4] in which comment fields have been used as a means of encoding rules.

For ASN.1 used in this ATS, two variations of encoding rules are used. One is the commonly known Basic Encoding Rules (BER) as specified in ISO/IEC 8825-1. In the second case the encoding is according to ISDN, i.e. the ASN.1 data types are a representation of structures contained within the ISDN specification (basic call, Generic functional protocol or individual supplementary service). For example, if octets of an information element are specified in ASN.1 as a SEQUENCE then this should be encoded in an Executable Test Suite (ETS) as any other ISDN information element specified using tabular TTCN. This ISDN encoding variation is the default encoding rule for this ATS. This means that all ASN.1 constraint tables are encoded using ISDN (non-BER) encoding unless stated otherwise. BER encoding should never be applied to an ASN.1 constraint where BER encoding has not been specified. This encoding rule is sometimes named "Direct Encoding".

For BER encoding, an indication is given in the comments field of the table header. For this ATS such indications appear in the ASN.1 type constraint declaration tables only. In the table header comment field, the notation "ASN1_Encoding: BER" is used.

In this particular ATS all ASN.1 type constraints which are of type "Component" are to be encoded using BER.

Table 1 shows an example of a ASN.1 type Constrained Declaration used in this ATS.

Table 1: ASN.1 type constraint declaration showing use of encoding variation

```
                        ASN.1 Type Constraint Declaration
Constraint Name : actRC_Inv_R1

ASN.1 Type        : Component

Derivation Path :

Comments          : received activationRC invoke component with don't care values.
                                Description
ActRC
actRC_InvokeComp
{ invokeID ? , -- invoke identifier don't care value
operation rCAct ,
argument {
 servedUserNr  ? ,
   pin * ,
   tan *
     }
}
Detailed comments :
```

7 ATS to TP map

The identifiers used for the TPs are reused as test case names. Thus there is a straightforward one-to-one mapping.

8 PCTR conformance

A test laboratory, when requested by a client to produce a PCTR, is required, as specified in ISO/IEC 9646-5 [4], to produce a PCTR conformant with the PCTR template given in annex B of ISO/IEC 9646-5 [4] .

Furthermore, a test laboratory, offering testing for the ATS specification contained in annex C, when requested by a client to produce a PCTR, is required to produce a PCTR conformant with the PCTR proforma contained in annex A.

A PCTR which conforms to this PCTR proforma specification shall preserve the content and ordering of the clauses contained in annex A. Clause A.6 of the PCTR may contain additional columns. If included, these shall be placed to the right of the existing columns. Text in italics may be retained by the test laboratory.

9 PIXIT conformance

A test realizer, producing an executable test suite for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-4 [4], to produce an augmented partial PIXIT proforma conformant with this partial PIXIT proforma specification.

An augmented partial PIXIT proforma which conforms to this partial PIXIT proforma specification shall, as a minimum, have contents which are technically equivalent to annex B. The augmented partial PIXIT proforma may contain additional questions that need to be answered in order to prepare the Means Of Testing (MOT) for a particular IUT.

A test laboratory, offering testing for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-5 [4], to further augment the augmented partial PIXIT proforma to produce a PIXIT proforma conformant with this partial PIXIT proforma specification.

A PIXIT proforma which conforms to this partial PIXIT proforma specification shall, as a minimum, have contents which are technically equivalent to annex B. The PIXIT proforma may contain additional questions that need to be answered in order to prepare the test laboratory for a particular IUT.

10 ATS conformance

The test realizer, producing MOT and ETS for this ATS specification, shall comply with the requirements of ISO/IEC 9646-4 [4] . In particular, these concern the realization of an ETS based on each ATS. The test realizer shall provide a statement of conformance of the MOT to this ATS specification.

An ETS which conforms to this ATS specification shall contain test groups and test cases which are technically equivalent to those contained in the ATS in annex C. All sequences of test events comprising an abstract test case shall be capable of being realized in the executable test case. Any further checking which the test system might be capable of performing is outside the scope of this ATS specification and shall not contribute to the verdict assignment for each test case.

Test laboratories running conformance test services using this ATS shall comply with ISO/IEC 9646-5 [4].

A test laboratory which claims to conform to this ATS specification shall use an MOT which conforms to this ATS.

Annex A (normative):
Protocol Conformance Test Report (PCTR) proforma

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the PCTR proforma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.

A.1   Identification summary

A.1.1   Protocol conformance test report

PCTR number:	
PCTR date:	
Corresponding SCTR number:	
Corresponding SCTR date:	
Test laboratory identification:	
Test laboratory manager:	
Signature:	

A.1.2   IUT identification

Name:	
Version:	
Protocol specification:	EN 301 799-1
PICS:	
Previous PCTRs (if any):	

A.1.3   Testing environment

PIXIT reference number:	
ATS specification:	EN 301 799-2
Abstract test method:	Multi-party test method (see ISO/IEC 9646-2)
Means of testing identification:	
Dates of testing:	
Conformance log reference(s):	
Retention date for log reference(s):	

A.1.4   Limits and reservations

Additional information relevant to the technical contents or further use of the test report, or to the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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A.1.5   Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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A.2   IUT conformance status

This IUT has / has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause A.3 of this report) and there are no "FAIL" verdicts to be recorded (in clause A.6) strike the words "has", otherwise strike the words "has not".

A.3   Static conformance summary

The PICS for this IUT is / is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

A.4   Dynamic conformance summary

The test campaign did / did not reveal errors in the IUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause A.6 of this report) strike the word "did", otherwise strike the words "did not".

Summary of the results of groups of tests:

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A.5   Static conformance review report

If clause A.3 indicates non-conformance, this clause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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A.6   Test campaign report

ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
RC_U01_001				
RC_U01_002				
RC_U01_003				
RC_U01_004				
RC_U01_005				
RC_U01_006				
RC_U01_007				
RC_U01_008				
RC_U01_009				
RC_U01_010				
RC_U01_011				
RC_U01_012				
RC_U01_013				
RC_U01_014				
RC_U01_015				
RC_U01_016				
RC_U01_017				
RC_U02_001				
RC_U02_002				
RC_U02_003				
RC_U02_004				
RC_U02_005				
RC_U02_006				
RC_U02_007				
RC_U02_008				
RC_U02_009				
RC_U02_010				
RC_U02_011				
RC_U02_012				
RC_U02_013				
RC_U02_014				
RC_U02_015				
RC_U02_016				
RC_U02_017				
RC_U03_001				
RC_U03_002				
RC_U03_003				
RC_U03_004				
RC_U03_005				
RC_U03_006				
RC_U03_007				
RC_U03_008				
RC_U03_009				
RC_U03_010				
RC_U03_011				
RC_U03_012				
RC_U03_013				
RC_U03_014				
RC_U04_001				
RC_U04_002				
RC_U04_003				
RC_U04_004				
RC_U04_005				
RC_U04_006				
RC_U04_007				

ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
RC_U04_008				
RC_U04_009				
RC_U04_010				
RC_U04_011				
RC_U04_012				
RC_U04_013				
RC_U04_014				
RC_U04_015				
RC_U05_001				
RC_U05_002				
RC_U05_003				
RC_U05_004				
RC_U05_005				
RC_U05_006				
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RC_U08_006				
RC_U08_007				
RC_U08_008				
RC_U08_009				
RC_U08_010				
RC_U08_011				

ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
RC_U09_001				
RC_U09_002				
RC_U09_003				
RC_U09_004				
RC_U09_005				
RC_U09_006				
RC_U09_007				
RC_U09_008				
RC_U09_009				
RC_U09_010				
RC_U09_011				
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RC_U10_002				
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RC_U10_004				
RC_U10_005				
RC_U10_006				
RC_U10_007				
RC_U10_008				
RC_U10_009				
RC_U10_010				
RC_U10_011				
RC_U10_012				

A.7   Observations

Additional information relevant to the technical content of the PCTR are given here.

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Annex B (normative):
Partial PIXIT proforma

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the partial PIXIT proforma in this annex so that it can be used for its intended purposes and may further publish the completed PIXIT.

B.1   Identification summary

PIXIT number:

....

Test laboratory name:

....

Date of issue:

....

Issued to:

....

B.2   Abstract test suite summary

Protocol specification: EN 301 264

ATS specification: EN 301 799-2

Abstract test method: Multi-party test method (see ISO/IEC 9646-2)

B.3   Test laboratory

Test laboratory identification:

....

Accreditation status of the test service:

....

Accreditation reference:

....

Test laboratory manager:

....

Test laboratory contact:

....

Means of testing:

....

Test laboratory instructions for completion:

....

B.4   Client (of the test laboratory)

Client identification:

....

Client test manager:

....

Client contact:

....

Test facilities required:

....

B.5   System Under Test (SUT)

Name:

....

Version:

....

SCS reference:

....

Machine configuration:

....

Operating system identification:

....

IUT identification:

....

PICS (all layers):

....

....

Limitations of the SUT:

....

Environmental conditions:

....

B.6 Protocol information

B.6.1 Protocol identification

Specification reference: EN 301 799-1

Protocol version:

PICS reference:

> NOTE: The PICS reference should reference a completed PICS which is conformant with the PICS proforma contained in EN 301 799-2.

B.6.2 Parameter values

Table B.1: Configuration aspects

Item	Question	Supported? (Y/N)	Allowed values	Value
1.1	What length of Call Reference is used?		1 for BA 2 for PRA	
1.2	Does the IUT need to activate the RC before to send a deactivation component?		Y/N	
1.3	Does the IUT need to deactivate the RC before to send an activation component again?		Y/N	
1.4	Does the IUT need to invoke the RC before to send a revoke component?		Y/N	
1.5	Does the IUT need to revoke the RC before to send a invokation component again?		Y/N	
1.6	Does the IUT send RESTART message after the re-establishment of the multiple frame operation?		Y/N	

B.6.3   Configuration of IUT

Table B.2: Actions required to configure the IUT

Item	Action: What actions, if possible, have to be taken to configure the IUT ...	Supported? (Y/N)	Stimulus (action taken)
2.1	so that the Remote Control service is not available.		
2.2	so that the Remote Control service is not available.		
2.3	so that deactivation and activation are not supported at the home location.		
2.4	so that the activation of the Remote Control service is precluded by a supplementary service interaction procedure.		
2.5	so that deactivation and activation are not supported at the remote location.		
2.6	so that deactivation and activation are not subscribed at the remote location.		
2.7	is forced to send the error value "userControlBolcked". After executing the corresponding test case, user control is not longer possible and the IUT has to be reseted.		

B.6.4   Parameter values

Table B.3: Parameter values

Item	Give an example of ...	Supported? (Y/N)	Allowed values	Value
3.1	a valid ServedUserNumber			
3.2	an valid ServedUserNumber			
3.3	a valid PIN number.			
3.4	an invalid PIN number.			
3.5	a PIN number that is expired.			
3.6	a valid TAN number for the first transaction. (note)			
3.7	a valid TAN number for the second transaction. (note)			
3.8	a valid TAN number for the third transaction. (note)			
3.9	a valid TAN number for the fourth transaction. (note)			
3.10	an invalid TAN number.			
NOTE:	The set of 4 TANs is the same for each test case as it is not possible to provide as many TAN parameters as transactions.			

B.6.5   Timer values

Table B.4: Timer values

Item	Timer duration	Supported? (Y/N)	Allowed values	Value
4.1	Timer that is used to wait for the test operator to perform an implicit send action or to wait for a PTC to react (TWAIT). Duration in s.		Integer	
4.2	Timer that is used to wait for the IUT to respond to a stimulus sent by the tester (TAC). Duration in s.		Integer	
4.3	Timer that is used to control that the IUT does not respond to a stimulus sent by the tester (TNOAC). Duration in s.		Integer	
4.4	Timer that is used to wait for a RESTART PDU(T_RESTART). Duration in s		Integer	
4.5	Timer that is used to control the procedures associated with T-IDLEGUARD. Timer value in second.		Integer	
NOTE:	The IUT provider fill in a value range rather than a fixed value for the test management timers. During test execution the test laboratory will choose specific values for the timers dependant on the means of testing used. These specific values may even be beyond the range given by the IUT provider, if this is necessary for achieving satisfactory test results.			

B.7   Basic call PIXIT items

B.7.1   Parameter values - information element coding

Table B.5: Coding of information elements

Item	Information element: provide, if possible, ...	Supported? (Y/N)	Value
N1.1	a coding of a Bearer Capability information element, which the IUT is compatible with, for the purpose of accepting received SETUP messages and which may be used in SETUP messages to be transmitted		
N1.2	a coding of a High layer compatibility information element, which the IUT is compatible with, for the purpose of accepting received SETUP messages and which may be used in SETUP messages to be transmitted		
N1.3	a coding of a Low layer compatibility information element, which the IUT is compatible with, for the purpose of accepting received SETUP messages and which may be used in SETUP messages to be transmitted		
N1.4	a Called party number information element, which the IUT is compatible with, for ...		
N1.4.1	served user access		
N1.4.2	first remote user access		
N1.4.3	second remote user access		
N1.4.4	third remote user access		
N1.5	preferred channel number to be used for the purpose of accepting received SETUP messages, for ... (note 1)		
N1.5.1	single call at served user side		
N1.5.2	second call at served user side		
N1.5.3	first call at remote user side		
N1.5.4	second call at remote user side		
N1.5.5	third call at remote user side		
NOTE 1: Items N1.5.1 to N1.5.5 are applicable for primary rate access only. NOTE 2: As this is a general table used for all supplementary services, all items N1.4.1 to N1.4.4, and N1.5.1 to N1.5.5 (if primary rate access is supported), are not always required, but should be supplied if possible.			

Annex C (normative):
Abstract Test Suite (ATS)

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [4].

The ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the table of contents. The ATS itself contains a test suite overview part which provides additional information and references.

C.1   The TTCN Graphical form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (sp1311741.PDF contained in archive en_30179904v010101c0.ZIP) which accompanies the present document.

C.2   The TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (sp1311741.MP contained in archive en_30179904v010101c0.ZIP) which accompanies the present document.

NOTE: Where an ETSI Abstract Test Suite (in TTCN) is published in both .GR and .MP format these two forms shall be considered equivalent. In the event that there appears to be syntactical or semantic differences between the two then the problem shall be resolved and the erroneous format (whichever it is) shall be corrected.

History

Document history			
V1.1.1	February 2001	Public Enquiry	PE 20010608: 2001-02-07 to 2001-06-08