EUROPEAN TELECOMMUNICATION STANDARD

ETS 300 182-4

September 1996

Source: ETSI TC-SPS

Reference: DE/SPS-05061-K-4

ICS: 33.080

Key words: ISDN, DSS1, supplementary service, AOC, testing, ATS, PIXIT, user

Integrated Services Digital Network (ISDN); Advice of Charge (AOC) 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

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 92 94 42 00 - Fax: +33 93 65 47 16

Contents

Foreword

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

This ETS is part 4 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Advice of Charge (AOC) supplementary service, as described below:

Part 1: "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: "TSS&TP specification for the network";

Part 6: "ATS and partial PIXIT proforma specification for the network".

Transposition dates	
Date of adoption of this ETS:	30 August 1996
Date of latest announcement of this ETS (doa):	31 December 1996
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 June 1997
Date of withdrawal of any conflicting National Standard (dow):	30 June 1997

Blank page

1 Scope

This fourth part of ETS 300 182 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 (as defined in ITU-T Recommendation I.411 [11]) of implementations conforming to the stage three standard for the Advice of Charge (AOC) supplementary service for the pan-European Integrated Services Digital Network (ISDN) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol, ETS 300 182-1 [2].

ETS 300 182-3 [4] 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 Network side of the T reference point or coincident S and T reference point of implementations conforming to ETS 300 182-1 [2].

2 Normative references

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

[1] ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".

[2] ETS 300 182-1 (1993): "Integrated Services Digital Network (ISDN); Advice of Charge (AOC) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[3] ETS 300 182-2 (1995): "Integrated Services Digital Network (ISDN); Advice of Charge (AOC) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[4] ETS 300 182-3: "Integrated Services Digital Network (ISDN); Advice of Charge (AOC) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification for the user".

[5] ETS 300 196-1 (1993): "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[6] ISO/IEC 9646-1: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 1: General Concepts".

[7] ISO/IEC 9646-2: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 2: Abstract Test Suite Specification".

[8] ISO/IEC 9646-3: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 3: The Tree and Tabular Combined Notation".

[9] ISO/IEC 9646-4: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 4: Test realization".

[10] ISO/IEC 9646-5: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 5: Requirements on test laboratories and clients for the conformance assessment process".

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

[12] CCITT Recommendation X.209 (1988): "Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

Abstract Test Suite (ATS): See ISO/IEC 9646-1 [6].

Implementation Under Test (IUT): See ISO/IEC 9646-1 [6].

Lower Tester (LT): See ISO/IEC 9646-1 [6].

Point of Control and Observation (PCO): See ISO/IEC 9646-1 [6].

Protocol Implementation Conformance Statement (PICS): See ISO/IEC 9646-1 [6].

PICS proforma: See ISO/IEC 9646-1 [6].

Protocol Implementation eXtra Information for Testing (PIXIT): See ISO/IEC 9646-1 [6].

PIXIT proforma: See ISO/IEC 9646-1 [6].

System Under Test (SUT): See ISO/IEC 9646-1 [6].

Upper Tester (UT): See ISO/IEC 9646-1 [6].

3.2 Abbreviations

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

AOC	Advice of Charge
ASP	Abstract Service Primitive
ATM	Abstract Test Method
ATS	Abstract Test Suite
BER	Basic Encoding Rules
ExTS	Executable Test Suite
FIE	Facility Information Element
IUT	Implementation Under Test
LT	Lower Tester
MOT	Means Of Testing
PCO	Point of Control and Observation
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
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 (ATM)

The remote test method is applied for the AOC user ATS. The Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3. 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.

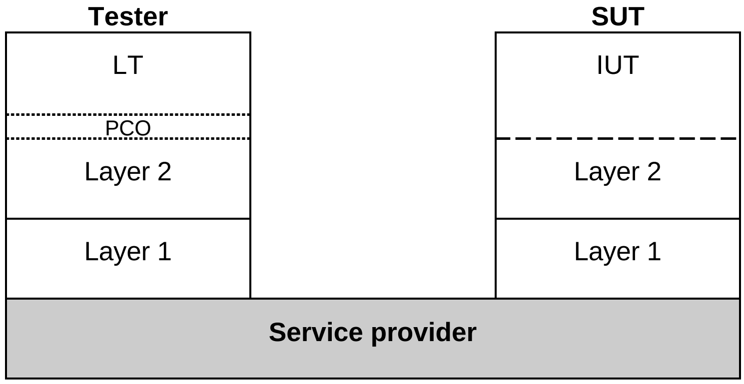

Figure 1: Remote test method

ISO/IEC 9646-2 [7] allows the informal expression of Test Co-ordination Procedures (TCP) between the System Under Test (SUT) upper layer(s) and the Lower Tester (LT). In the ATS contained in annex C, TCP is achieved by use of a second "informal" PCO, called "O" (for Operator). This PCO is used to specify control but not observation above the IUT and consequently, events at this PCO are never used to generate test case verdicts. The use of this O PCO is regarded as a preferred alternative to the use of the implicit send event, in that it allows the ATS to specify in a clear and meaningful way what actions are required to be performed on the IUT.

5 Untestable test purposes

There are no untestable test purposes associated with this ATS.

6 ATS conventions

This clause is structured similarly to the structure of a TTCN ATS. However, the names of the subclauses are arranged in a way more suitable to this ETS.

6.1 Declarations part

6.1.1 Type definitions

6.1.1.1 Simple type definitions

Where appropriate, simple types have a length, a value list or a range restriction attached.

Simple types defined as being of some string type (e.g. BIT STRING, OCTET STRING), have a length restriction or a value list attached.

Simple types, defined as being of INTEGER type, have a value list or a range restriction attached.

6.1.1.2 Structured type definitions

6.1.1.2.1 TTCN structured type definitions

All structured type definitions are provided with a full name.

All elements in every structured type definition, defined as being of some string type (e.g. BIT STRING, OCTET STRING), have a length restriction attached.

If an element in a structured type definition is defined as being of a referenced type, the (possible) restriction is defined in that referenced type.

For information elements the identifier, which is unique for each element, has its type defined as a simple type where the value list is restricted to the single value which is the identifier itself. This has the advantage that it allows a test system derived from this ATS to easily identify information elements embedded in messages. An ATS where information element identifiers are represented as unrestricted types can present difficulties for a derived test system in the case where it needs to find one information element embedded in a number of others and the constraints for the other elements have the any-or-omit value. In such a case the test system cannot easily find the beginning of each information element.

6.1.1.2.2 ASN.1 structured type definitions

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.

The fact that ASN.1 provides a better restriction mechanism for type definitions is used for the purpose of achieving type-compatibility.

In table 1, the ASN.1 type BIT7OR15 is defined as being of type BIT STRING with a size constraint attached to it. The size is determined by the value of CR_LENGTH, a test suite parameter. It can have the value of either 7 or 15. The type BIT7OR15 is used in the structured type CR, field cr_r allowing this type to represent a Basic Access or a Primary Rate Access call reference. By using this type definition the field cr_r is always type compatible with values of type BIT STRING (SIZE(7)) and BIT STRING (SIZE(15)). Another approach to solve this problem would be to define the type BIT7OR15 as BIT STRING (SIZE(7 | 15)). This type has a small disadvantage compared with the previous one. It is impossible, in run-time, to determine the actual length of any instance of this type.

Table 1: ASN.1 type definition BIT7OR15

ASN.1 Type Definition
Type Name : BIT7OR15 **Comments** :
Type Definition
BIT STRING(SIZE(CR_LENGTH))

Table 2 shows a typical use of ASN.1. The CHI element will have two different type definitions depending on whether it represents basic or primary rate access. In TTCN, this needs to be defined as two different types. In ASN.1 this can be done in one, the type being a choice of either BASIC_CHI or PRIMARY_CHI. These two types are then (locally) defined in the same table.

Table 2: ASN.1 type definition CHI

```
ASN.1 Type Definition
Type Name : CHI
Comments  : Info Element Channel Identification
            ETS 300 102-1 clause 4.5.13
Type Definition
CHOICE {
 basic    BASIC_CHI,
 primary  PRIMARY_CHI
}

-- Local type definitions --

BASIC_CHI ::= SEQUENCE {
 chi_i       CHI_I,                    -- Identifier
 chi_l       BIT STRING(SIZE(8)),      -- Length
 chi_e3_cs   BIT STRING(SIZE(8))       -- Channel selection
}

PRIMARY_CHI ::= SEQUENCE {
 chi_i       CHI_I,                    -- Identifier
 chi_l       BIT STRING(SIZE(8)),      -- Length
 chi_e3_p1   BIT STRING(SIZE(4)),      -- First nibble of Channel selection
 chi_e3_pe   BIT STRING(SIZE(1)),      -- Preferred/Exclusive Bit
 chi_e3_p3   BIT STRING(SIZE(3)),      -- Last three bits of Channel selection
 chi_e4      BIT STRING(SIZE(8)),      -- Channel type
 chi_e5_chl  BIT STRING(SIZE(1)),
 chi_e5_ch2  BIT STRING(SIZE(7))       -- Channel number
}
```

Table 3 shows an example of how ASN.1 can be used to model unordered sequences.

Table 3: ASN.1 type definition FIES

```
ASN.1 Type Definition
Type Name : FIES
Comments  :
Type Definition
SET OF FIE
```

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

6.1.1.3 ASP type definitions

6.1.1.3.1 TTCN ASP type definitions

TTCN ASP type definitions only contain one PDU or no PDU at all. The relationship between an ASP type and a PDU type is one-to-one. That is, there exists one ASP type definition for each PDU type definition (if that ASP type contains a PDU).

All TTCN ASP type definitions are provided with a full identifier.

Some ASPs are not parameterized as shown in the example in table 4. Such ASPs are only used for requesting or receiving service from the lower layer.

Table 4: TTCN ASP type definition DL_REL_IN

TTCN ASP Type Definition		
ASP NAME : DL_REL_IN (DL_RELEASE_INDICATION) **PCO Type** : SAP **Comments** :		
Parameter Name	**Parameter Type**	**Comments**
Detailed Comments :		

Table 5 shows an example of a parameterized ASP. All ASPs containing PDUs contain only that PDU and no other parameters.

Table 5: TTCN ASP type definition DL_DATA_RQ_ALERT

TTCN ASP Type Definition		
ASP NAME : DL_DATA_RQ_ALERT (DL_DATA_REQUEST) **PCO Type** : SAP **Comments** :		
Parameter Name	**Parameter Type**	**Comments**
mun (MessageUnit)	ALERT_PDU	
Detailed Comments :		

6.1.1.3.2 ASN.1 ASP type definitions

There are no ASN.1 ASP type definitions in the ATS.

6.1.1.4 PDU type definitions

6.1.1.4.1 TTCN PDU type definitions

The TTCN PDU type reflects the actual data being transferred or received. All PDUs are embedded in ASPs.

If a specific PDU type definition contains elements defined in terms of a pre-defined type, that element has a restriction attached to it.

6.1.1.4.2 ASN.1 PDU type definitions

There are no ASN.1 PDU type definitions in the ATS.

6.1.2 Test suite constants

No test suite constants are used or defined in this ATS.

6.1.3 Test suite parameters

Each test suite parameter is defined in terms of a predefined type or a referenced type. A referenced type is used when it is necessary to attach restrictions to these type definitions (it is not allowed to include restrictions directly in the test suite parameter table). The referenced type can have a length or value restriction attached to it in its declaration table.

6.1.4 Variables

6.1.4.1 Test suite variables

No test suite variables are used or defined in this ATS.

6.1.4.2 Test case variables

Each test case variable is defined in terms of a predefined type or a referenced type. A referenced type is used when it is necessary to attach restrictions to these type definitions (it is not allowed to include restrictions directly in the test case variable table). The referenced type can have a length or value restriction attached to it in its declaration table.

Where test case variables are used in constraints, they are passed as formal parameters.

6.1.5 Test suite operation definitions

The description part of a test suite operation definition uses either natural language or meta C.

Table 6: Test suite operation definition ASSIGN_CHI

```
                         Test Suite Operation Definition
Operation Name : ASSIGN_CHI(basic, primary : CHI; basic_flag : BOOLEAN)
Result Type    : CHI
Comments       : This operation is used to assign a correct Channel identification information
                 element to PDUs dependent on the type of access that is tested.
                                   Description
{
if(basic_flag)
  return basic;
else
  return primary
}
Detailed comments :
```

The test suite operation definition shown in table 6 is used in the constraints part when assigning an element of type CHI a value. As previously described, the CHI type can be defined in two ways depending on whether the ATS is testing basic or primary rate access. To avoid duplicate types and thereby duplicate test cases the CHI type is defined in ASN.1. This operation is used to assign a value to an element of CHI type. It takes three parameters:

```
primary:          a constraint of type CHI valid for primary rate access;
basic:            a constraint of type CHI valid for basic access;
basic_flag:       a Boolean value: TRUE if basic access is applicable, FALSE otherwise.
```

This operation returns the correct constraint according to the Boolean flag basic_flag. That constraint will then be assigned to the specific element of type CHI.

6.2 Constraints part

6.2.1 Structured type constraint declaration

For every structured type definition there exists one or more structured type constraint.

6.2.2 ASN.1 type constraint declaration

Constraints of this type are used to assign the corresponding type a specific value. These constraints are used for the purpose of modelling unordered data or specific types that cannot be expressed in TTCN.

A value assigned to an element of type SET OF differs depending on whether it is a send or receive constraint.

Table 7: ASN.1 type constraint declaration fIEs (send constraint)

```
                        ASN.1 Type Constraint Declaration
Constraint Name : fIEs(comp : Component)
ASN.1 Type      : FIE
Derivation Path :
Comments        : Send FIE which will contain one component "comp".
                                   Description
{
  informationElementIdentifier   '00011100'B,
  length                         CALC_FIE_LENGTH(comp),
  extBit                         '1'B,
  spareBits                      '00'B,
  protocolProfile                '10001'B,
  components                     {comp}
}
Detailed comments :
```

NOTE 1: The last element in the constraint, *components*, is of type *SET OF Component* where *Component* is structured data of some type.

If the constraint is a send constraint (as in table 7) the value for the component element is stated as "{comp}" where comp is an argument received as a parameter. The "{" and "}" turns the value into a SET OF value which is correct according to that element's type definition.

Table 8: ASN.1 type constraint declaration fIEr (receive constraint)

```
                        ASN.1 Type Constraint Declaration
Constraint Name : fIEr(comp : Component)
ASN.1 Type      : FIE
Derivation Path :
Comments        : A received FIE which can contain several components, but which contains at
                  least "comp".
                                   Description
{
  informationElementIdentifier   '00011100'B,
  length                         '????????'B,
  extBit                         '1'B,
  spareBits                      '00'B,
  protocolProfile                '10001'B,
  components                     SUPERSET({comp})
}
Detailed comments :
```

NOTE 2: The last element in the constraint, *components*, is of type *SET OF Component* where *Component* is structured data of some type.

If the constraint is a receive constraint (as in table 8) the corresponding matching value is assigned by using SUPERSET. The key-word SUPERSET has an argument that is type compatible with the type definition of that field. In table 8, the element named *components* is defined as "SET OF Component" and this implies that the argument to SUPERSET should be of type SET OF Component. This is achieved the same way as for send constraints, enclosing the value in curly brackets.

The semantic of SUPERSET is stated in ISO/IEC 9646-3 [8], subclause 11.6.4.7. In short it defines the semantic as follows: "*A value that uses SUPERSET matches the incoming value if, and only if, the incoming value contains **at least all of the elements** defined within the SUPERSET, and **may contain more elements**.*" This is exactly the semantic definition used in this ATS.

6.2.2.1 Specification of encoding rules

At the time of specifying this ATS the mechanisms related to encoding of ASN.1 types, specified in DAM-2 of ISO/IEC 9646-3 [8], were not yet stable. Nevertheless as there is a variation in the encoding rules as applied to ASN.1 types and constraints specified in this ATS, a mechanism is used to differentiate the different encoding rules. Given the non-finalized status of DAM-2, a solution which is broadly in the spirit of DAM-2 has been created. Comment fields have been used as a means of including the 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 CCITT Recommendation X.209 [12]. 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 (ExTS) 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.

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 first line of the table header comment field, the notation "ASN1_Encoding: *BER*" is used.

Note that within BER, there are a number of variations for the encoding of lengths of fields. According to ETS 300 196-1 [5], an IUT should be able to interpret all length forms within BER for received PDUs. When sending PDUs containing BER encoding, ETS 300 196-1 [5] gives guidelines but makes no restrictions on the length forms within BER which an IUT may apply.

In relation to components sent by the tester to the IUT, implementors of this ATS shall use a variety of length forms such that at least one of each of the length forms is sent to the IUT during a test campaign. The variations of length forms to be used are indefinite, short definite and long definite.

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

Table 9: ASN.1 type constraint declaration showing use of encoding variation

```
ASN.1 Type Constraint Declaration
Constraint Name : Beg3PTYinv
ASN.1 Type      : Component
Derivation Path :
Comments        : ASN1_Encoding: BER
                  Receive component: Begin3PTY invoke component
Description
begin3PTY_Components
  begin3PTY_InvokeComp
    { invokeID          ? ,
      operation_value   localValue    4}
Detailed comments :
```

6.2.3 ASP type constraint declaration

6.2.3.1 ASN.1 ASP type constraint declaration

No ASN.1 ASP type constraint declaration exists in this ATS.

6.2.3.2 TTCN ASP type constraint declaration

For TTCN ASP constraint declarations there is a one-to-one relationship between its type and the constraint. That is, there is only one constraint for each TTCN ASP Type Declaration. The reason for this is that the ASPs are used only for carrying a specific PDU value. The many ASP constraints (and types) could have been avoided by using the meta type **PDU**, but that was not suitable as values inside a specific PDU have to be referenced. To reference elements inside a value of meta type **PDU** is not allowed according to ISO/IEC 9646-3 [8], so each ASP has to be defined as having a parameter of a specific PDU type.

In all ASP constraints the embedded PDU constraint is either chained static or "semi-dynamic". That is, the PDU constraint is always fixed to a specific ASP constraint but it (the PDU) may be parameterized.

All ASP constraints have a specific value for its parameter. No matching symbols are used in ASPs.

6.2.4 PDU type constraint declaration

6.2.4.1 ASN.1 PDU type constraint declaration

No ASN.1 PDU type constraint declaration exists in this ATS.

6.2.4.2 TTCN PDU type constraint declaration

PDU constraints are used for assigning values or patterns to the data being sent or received.

6.2.5 Chaining of constraints

6.2.5.1 Static chaining

Static chaining, that is a fixed reference to a specific constraint, is used in this ATS. The static chaining is used for static binding of both variables and sub-structures.

6.2.5.2 Dynamic chaining

Dynamic chaining is achieved when having a reference to a value which is unknown. The only thing known (before run-time) is the type of that reference. The reference is passed as a parameter. Strict dynamic chaining is not used in this ATS. What is used is something that is called "semi-dynamic chaining". The definition of semi-dynamic chaining is that the fixed reference is parameterized with an unknown value. That value is received as a parameter.

Table 10: TTCN ASP constraint declaration A_RST1

TTCN ASP Constraint Declaration		
Constraint Name : A_RST1(FLAG : INTEGER) **ASN.1 Type** : DL_DAT_IN_RESTARTr **Derivation Path** : **Comments** :		
Parameter Name	**Parameter Value**	**Comments**
mun	RST1(FLAG)	RST1(FLAG)
Detailed comments :		

Table 10 is an example of semi-dynamic chaining. The TTCN ASP constraint is parameterized with an INTEGER value named FLAG. That value is passed further down in the structure as a parameter to a static named PDU constraint reference.

6.2.6 Derived constraints

No derivation of any constraint is used. All constraints are considered to be base constraints.

6.2.7 Parameterized constraints

Parameterized constraints are used in this ATS.

6.2.8 Value assignment

6.2.8.1 Specific values

For specific value assignment both explicit values and references to explicit values are used.

6.2.8.2 Matching values

As matching values the following mechanisms are used:

Instead of Value:
- AnyOrOmit "*"
- AnyValue "?"
- SuperSet SUPERSET
- Omit "-"

Inside value:
- AnyOne "?"
- AnyOrNone "*"

6.3 Dynamic part

6.3.1 Test cases

Each test case contains the test purpose text from ETS 300 182-3 [4]. To be able to read and understand the test case dynamic behaviour it is recommended that the test steps are understood first.

6.3.2 Test steps

Much use has been made of test steps to avoid needless repetition of dynamic behaviour. Many test steps are based on those used for the ISDN basic call ATS.

6.3.3 Defaults

Note the use of the RETURN statement which is defined in DAM1 of ISO/IEC 9646-3 [8]. This allows valid background behaviour to be handled in the default tree with a possibility to return to the original set of alternatives in the test case.

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 [10], to produce a PCTR conformant with the PCTR template given in annex B of ISO/IEC 9646-5 [10].

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 of this ETS.

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 [9], 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 [10], 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 ExTS for this ATS specification, shall comply with the requirements of ISO/IEC 9646-4 [9]. In particular, these concern the realization of an ExTS based on each ATS. The test realizer shall provide a statement of conformance of the MOT to this ATS specification.

An ExTS 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 [10].

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

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:	ETS 300 182-1
PICS:	
Previous PCTRs (if any):	

A.1.3 Testing environment

PIXIT Reference number:	
ATS Specification:	ETS 300 182-4
Abstract Test Method:	Remote 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.

....

....

....

....

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.

....

....

....

....

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 word "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:

....

....

....

....

....

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.

....

....

....

....

....

....

....

A.6 Test campaign report

ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
AOC_U01_001				
AOC_U01_002				
AOC_U01_003				
AOC_U01_004				
AOC_U01_005				
AOC_U01_006				
AOC_U01_007				
AOC_U01_008				
AOC_U01_009				
AOC_U01_010				
AOC_U01_011				
AOC_U01_012				
AOC_U01_013				
AOC_U01_014				
AOC_U01_015				
AOC_U01_016				
AOC_U01_017				
AOC_U01_018				
AOC_U01_019				
AOC_U01_020				
AOC_U01_021				
AOC_U02_001				
AOC_U02_002				
AOC_U02_003				
AOC_U02_004				
AOC_U02_005				
AOC_U02_006				
AOC_U02_007				
AOC_U02_008				
AOC_U02_009				
AOC_U02_010				
AOC_U02_011				
AOC_U02_012				
AOC_U02_013				
AOC_U02_014				

(continued)

ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
AOC_U02_015				
AOC_U02_016				
AOC_U02_017				
AOC_U02_018				
AOC_U02_019				
AOC_U02_020				
AOC_U02_021				
AOC_U02_022				
AOC_U02_023				
AOC_U02_024				
AOC_U02_025				
AOC_U02_026				
AOC_U02_027				
AOC_U02_028				
AOC_U02_029				
AOC_U02_030				
AOC_U02_031				
AOC_U02_032				
AOC_U02_033				
AOC_U02_034				
AOC_U02_035				
AOC_U02_036				
AOC_U02_037				
AOC_U02_038				
AOC_U03_001				
AOC_U03_002				
AOC_U04_001				
AOC_U04_002				
AOC_U04_003				
AOC_U04_004				
AOC_U04_005				
AOC_U04_006				
AOC_U04_007				
AOC_U04_008				
AOC_U04_009				
AOC_U04_010				
AOC_U04_011				
AOC_U04_012				
AOC_U04_013				
AOC_U05_001				
AOC_U05_002				
AOC_U05_003				
AOC_U05_004				
AOC_U05_005				
AOC_U05_006				
AOC_U05_007				
AOC_U05_008				
AOC_U05_009				
AOC_U05_010				
AOC_U05_011				
AOC_U05_012				
AOC_U05_013				
AOC_U05_014				
AOC_U05_015				
AOC_U05_016				
AOC_U05_017				

(continued)

ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
AOC_U06_001				
AOC_U06_002				
AOC_U06_003				
AOC_U06_004				
AOC_U07_001				
AOC_U07_002				
AOC_U07_003				
AOC_U07_004				
AOC_U07_005				
AOC_U07_006				
AOC_U07_007				
AOC_U07_008				
AOC_U07_009				
AOC_U07_010				
AOC_U08_001				
AOC_U08_002				
AOC_U08_003				
AOC_U08_004				
AOC_U08_005				
AOC_U09_001				
AOC_U09_002				
AOC_U09_003				
AOC_U09_004				
AOC_U10_001				
AOC_U10_002				
AOC_U10_003				
AOC_U10_004				
AOC_U10_005				
AOC_U10_006				
AOC_U10_007				
AOC_U10_008				
AOC_U10_009				
AOC_U10_010				
AOC_U10_011				
AOC_U10_012				
AOC_U10_013				
AOC_U10_014				
AOC_U10_015				
AOC_U10_016				
AOC_U10_017				
AOC_U10_018				
AOC_U10_019				
AOC_U10_020				
AOC_U10_021				
AOC_U10_022				
AOC_U10_023				
AOC_U10_024				
AOC_U10_025				
AOC_U10_026				
AOC_U10_027				
AOC_U10_028				
AOC_U10_029				
AOC_U10_030				
AOC_U10_031				
AOC_U10_032				
AOC_U10_033				

(continued)

ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
AOC_U10_034				
AOC_U10_035				
AOC_U10_036				
AOC_U10_037				
AOC_U10_038				
AOC_U10_039				
AOC_U10_040				
AOC_U10_041				
AOC_U10_042				

A.7 Observations

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

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

....

Annex B (normative): Partial PIXIT proforma

B.1 Identification summary

PIXIT number:

....

Test laboratory name:

....

Date of issue:

....

Issued to:

....

B.2 Abstract test suite summary

Protocol specification:	ETS 300 182-1
ATS specification:	ETS 300 182-4
Abstract test method:	Remote 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: ETS 300 182-1

Protocol version:

PICS reference:

NOTE: The PICS reference should reference a completed PICS which is conformant with the PICS proforma contained in ETS 300 182-2.

B.6.2 Parameter values

Table B.1: Parameter values

Item	Question	Supported? (Y/N)	Allowed values	Value
1.1	Does the IUT support Basic Access?		N/A	N/A
1.2	What length of Call Reference is used?		1, 2	

B.6.3 Sending of messages by IUT

Table B.2: Actions required to stimulate IUT to send messages

Item	Action: What actions, if possible, have to be taken to cause the IUT to send a ...	Supported? (Y/N)	Stimulus (action taken)
2.1	SETUP message including a Facility information element coded as chargingRequest invoke component indicating AOC-S		
2.2	SETUP message including a Facility information element coded as chargingRequest invoke component indicating AOC-D		
2.3	SETUP message including a Facility information element coded as chargingRequest invoke component indicating AOC-E		

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 [8].

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

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

The TTCN.GR representation of this ATS is contained in a Postscript file (AOC_U09.PS[1)]) which accompanies this ETS.

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

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (AOC_U09.MP[1)]) which accompanies this ETS.

NOTE: According to ISO/IEC 9646-3 [8], in case of a conflict in interpretation of the operational semantics of TTCN.GR and TTCN.MP, the operational semantics of the TTCN.GR representation takes precedence.

---

1) This file is located in an archive file named 1824_E1.LZH. Other file formats are available on request.

Annex D (informative): General structure of ATS

This annex gives a simple listing of the order of types of tables which appear in a typical supplementary service ATS. This is intended as an aid in helping readers find particular sections quickly.

Test Suite Overview

Test Suite Structure

Test Case Index

Test Step Index

Default Index

Declarations Part

Simple Type Definitions

Structured Type Definitions

ASN.1 Type Definitions

Test Suite Operation Definitions

Test Suite Parameter Declarations

Test Case Selection Expression Definitions

Test Suite Constant Declarations

Test Case Variable Declarations

PCO Declarations

Co-ordination Point Declarations

Timer Declarations

Test Component Declarations

Test Components Configuration Declarations

TTCN ASP Type Definition

TTCN PDU Type Definition

TTCN CM Type Definition

Alias Definitions

Constraints Part

Structured Type Constraint Declarations

ASN.1 Type Constraint Declarations

TTCN ASP Constraint Declarations

TTCN PDU Constraint Declarations

TTCN CM Constraint Declarations

Dynamic Part

Test Case Dynamic Behaviour

Test Step Dynamic Behaviour

Default Dynamic Behaviour

History

Document history			
November 1995	Public Enquiry	PE 95:	1995-11-06 to 1996-03-01
May 1996	Vote	V 103:	1996-05-20 to 1996-08-23
September 1996	First Edition		

ISBN 2-7437-0253-2 - Edition complète
ISBN 2-7437-0898-0 - Partie 4
Dépôt légal : Septembre 1996