



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

T.523

(03/93)

TELEMATIC SERVICES

**TERMINAL EQUIPMENTS AND PROTOCOLS
FOR TELEMATIC SERVICES**

**COMMUNICATION APPLICATION
PROFILE DM-1 FOR VIDEOTEX
INTERWORKING**

ITU-T Recommendation T.523

(Previously "CCITT Recommendation")

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation T.523 was revised by the ITU-T Study Group VIII (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

2 In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

© ITU 1994

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the ITU.

CONTENTS

	<i>Page</i>
1 Scope	1
2 Field of application	1
3 References	1
4 Definitions	2
5 Overview of communication profile DM-1	2
6 Basic communication requirements for DM-1	2
6.1 DTAM functionalities	2
6.2 ACSE functionalities	3
6.3 Presentation functionalities	3
6.4 Session functionalities	3
7 Communication procedure for DM-1	3
7.1 General communication procedure	3
7.2 Application-association establishment	4
7.3 Application-association terminate and abort	4
7.4 Data transmission	4
8 Elements of procedure	10
8.1 Application-association establishment	10
8.2 Application-association termination	12
8.3 Application-association abort	13
8.4 Data transmission	13
9 Actions of the EH and the LH	16
9.1 EH action	16
9.2 LH action	17
9.3 List of permissible actions on VIA structure elements in both hosts	17
10 Object identifier	18
Annex A – Abstract syntax definition of videotex specific information	19
A.1 Encoding of user information associated with D-INITIATE services	19
A.2 Encoding of user information associated with D-ABORT services	19

COMMUNICATION APPLICATION PROFILE DM-1 FOR VIDEOTEX INTERWORKING

(Melbourne, 1988; revised at Helsinki, 1993)

1 Scope

1.1 The T.400-Series Recommendations generally defines open document architecture (ODA), document architecture operations and DTAM service/protocol for document architecture transfer and manipulation under the telematic communication environment.

1.2 This Recommendation defines a communication application profile DM-1 for document unconfirmed manipulation to specify an interactive communication profile based on DTAM between videotex gateway systems.

1.3 The use of Recommendations X.215, X.225, X.216, X.226, X.217 and X.227 for this communication profile is described in this Recommendation.

2 Field of application

2.1 The communication application profile DM-1 enables document manipulation for documents which are represented in accordance with the document application profile defined by Recommendation T.504, and the operational application profile defined by Recommendation T.541.

2.2 The ODA documents that are manipulated should be in formatted form.

2.3 The field of application of this Recommendation is the international videotex interworking service between videotex gateways, representing the external host (EH) and the local host (LH).

2.4 Videotex communication procedure is based on the model defined in this Recommendation in accordance with the Recommendation T.564 which defines gateway characteristics for videotex inter-working.

3 References

- Rec. T.101 *International interworking for videotex services*
- Rec. T.430-Series *Document transfer and manipulation (DTAM)*
- Rec. T.504 *Document application profile for videotex interworking*
- Rec. T.541 *Operational application profile for videotex interworking*
- Rec. T.564 *Gateway characteristics for videotex interworking*
- Rec. X.215 *Session service definition for open systems interconnection for CCITT applications*
- Rec. X.225 *Session protocol specification for open systems interconnection for CCITT applications*
- Rec. X.216 *Presentation service definition for open systems interconnection for CCITT applications*
- Rec. X.226 *Presentation protocol specification for open systems interconnection for CCITT applications*

- Rec. X.217 *Association control service definition for open systems interconnection for CCITT applications*
- Rec. X.227 *Association control protocol specification for open systems interconnection for CCITT applications*
- Rec. X.208 *Specification of abstract syntax notation one (ASN.1)*
- Rec. X.209 *Specification of basic encoding rules for abstract syntax notation one (ASN.1)*

4 Definitions

Terms and their definitions are defined by the Recommendations listed above.

5 Overview of communication profile DM-1

5.1 Communication profile DM-1 defines the communication functionalities which provide a real time remote document manipulation on ODA and operational structure documents by create, delete, modify and call operations between videotex gateways under OSI ACSE and presentation communication support functions (normal mode defined in Recommendation T.432). These operations are the unconfirmed type of manipulation.

5.2 This profile defines the communication model which consists of the local host DTAM user and the external host DTAM user as illustrated in Figure 1. Either the LH or the EH is capable of managing the initiation and termination of application-association. At the association establishment phase, initial VIA structures are automatically generated in both hosts.

5.3 The owner of the data token, managed by the DTAM token control function, is able to manipulate ODA and operational structure documents which are directly mapped from VIA operations defined in the Recommendation T.564.

5.4 The manipulation provides the operations which can be applied to one or more constituents of the ODA document and/or the operational structure. In this profile, these operations do effect addition, deletion or modification of constituent to a document which existed identically between both hosts.

5.5 When the data token belongs to the LH DTAM user, only modify operations on operational structure are allowed to be used by the LH DTAM user. On the other hand, the EH DTAM user is able to use all of the operations defined in DTAM when it has the data token.

6 Basic communication requirements for DM-1

DM-1 is defined under the following OSI communication environment. Mapping rules of DTAM APDUs into/out of the ACSE and presentation layer are used as defined in Recommendation T.433.

6.1 DTAM functionalities

The following DTAM functionalities defined in Recommendation T.432 are basic requirements for this communication profile DM-1:

- i) document unconfirmed manipulation by using create, modify, delete and call operations;
- ii) association use control;
- iii) token management for dialogue control;
- iv) typed data transmission.

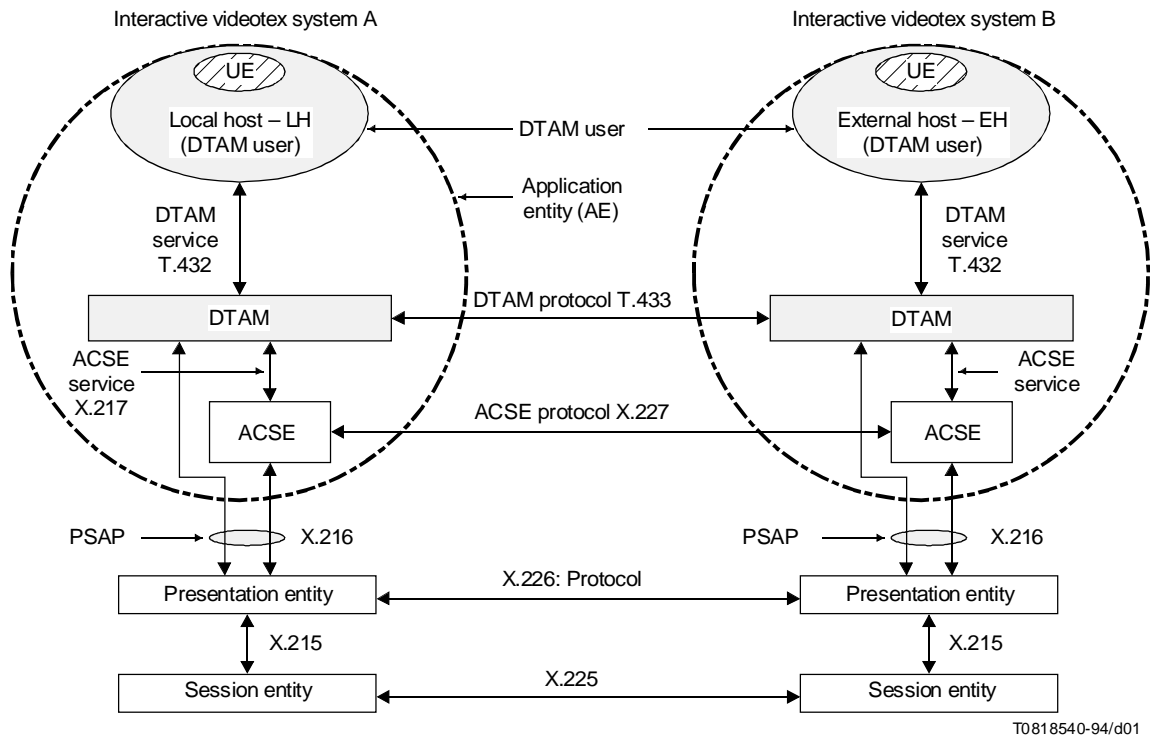


FIGURE 1/T.523

**A model of communication application profile DM-1
for videotex interworking**

6.2 ACSE functionalities

The basic functionalities of the association control service element defined by Recommendations X.217 and X.227 are used.

6.3 Presentation functionalities

The kernel functional unit is used as defined by Recommendations X.216 and X.226. Recommendations X.208 and X.209 are used for the definition of abstract notation and basic encoding rules of abstract notation respectively for DM-1.

6.4 Session functionalities

The kernel functional unit, two ways alternate functional unit and typed data functional unit are used in accordance with Recommendations X.215 and X.225.

7 Communication procedure for DM-1

7.1 General communication procedure

The general communication procedure for videotex gateway application is defined in line with the basic procedure in Recommendation T.432. The procedure consists of:

- application-association establishment;
- application-association termination;

- application-association abort;
- data transmission.

7.2 Application-association establishment

A communication normally begins with the establishment of application-association from the LH or EH DTAM user to initialize the communication environment and to set the initial parameters and the VIA structures being used. The initial data token is assigned to the EH DTAM user. After the establishment of application-association, both DTAM users move to the data transmission phase.

7.3 Application-association terminate and abort

The DTAM application-association may be normally terminated by either the LH or the EH DTAM user subject to the owning of the data token. The DTAM application-association may also be abruptly terminated by either the LH or the EH DTAM user or provider using the appropriate DTAM abort services.

7.4 Data transmission

7.4.1 General

Videotex gateway application provides the following communication functions in the data transmission phase:

- 1) manipulation of display information;
- 2) manipulation of data entry information;
- 3) manipulation of application control memory information;
- 4) manipulation of special terminal facilities information;
- 5) manipulation of administrative information;
- 6) exchange of over limit information (for further study);
- 7) transmission of asynchronous message.

7.4.2 Manipulation of display information

Display is performed by VIA operations, defined in Recommendation T.564, initiated by the external host on the display structure.

To perform VIA operations on the display structure the EH uses D-CREATE, D-MODIFY, D-DELETE or D-CALL service primitives under data token control.

7.4.3 Manipulation of data entry information

7.4.3.1 General

Recommendation T.564 defines the following four types of data entry:

- 1) data entry type 1 – information retrieval;
- 2) data entry type 2 – data collection;
- 3) data entry type 3 – data entry on the fly;
- 4) data entry type 4 – duplex data entry.

These data entry types are categorized into half duplex mode (data entry type 1, 2 and 3) and duplex mode (data entry type 4).

The EH may use D-CREATE, D-MODIFY, D-DELETE, D-CALL to perform VIA operations on each structure element of the data entry structure, except modifying the RESULT-SE and its associated content portion.

Half duplex mode of data entry provides the dialogues between the LH and the EH under the data token control. Data entry is performed from the LH by VIA operations via DTAM manipulation (D-MODIFY) on the data entry structure. In this case the EH should give the data token to the LH to perform data entry.

Duplex mode of data entry is not dependent upon the token control. Data entry is performed from the LH by the use of typed data and the data token is always located at the EH side.

7.4.3.2 Management of data entry mode

The management of the data entry modes is bound to the following rule:

- i) The LH issues the parameter of “data entry mode” to indicate the data entry capabilities at the LH side in the DTAM association establishment phase. This parameter is a choice of
 - a) half duplex mode
 - b) duplex mode and
 - c) half duplex and duplex modes.
- ii) the EH recognizes the capabilities of data entry mode which is capable to be managed by the LH. It is not necessary to inform the LH of the EH capabilities of the data entry mode;
- iii) if the LH indicates the only half duplex mode and selects the application based on the duplex mode, the EH may refuse to connect with the selected application from the LH;
- iv) if the LH indicates the only duplex mode and selects the application based on the half duplex mode, the EH may refuse to connect with the selected application from the LH;
- v) if the LH indicates both modes, all the applications based on the half duplex or duplex modes are available to the LH.

7.4.3.3 Operation of data entry in half duplex mode (type 1, 2, 3)

In data entry type 1 or 3, the entered data are sent from the LH to the EH using D-MODIFY for the RESULT-SE and the content portion associated to the RESULT-SE. In data entry type 2, the entered data are sent from the LH to the EH using D-MODIFY for the RESULT-SE and the content portions associated with the entered fields and the RESULT-SE (if necessary).

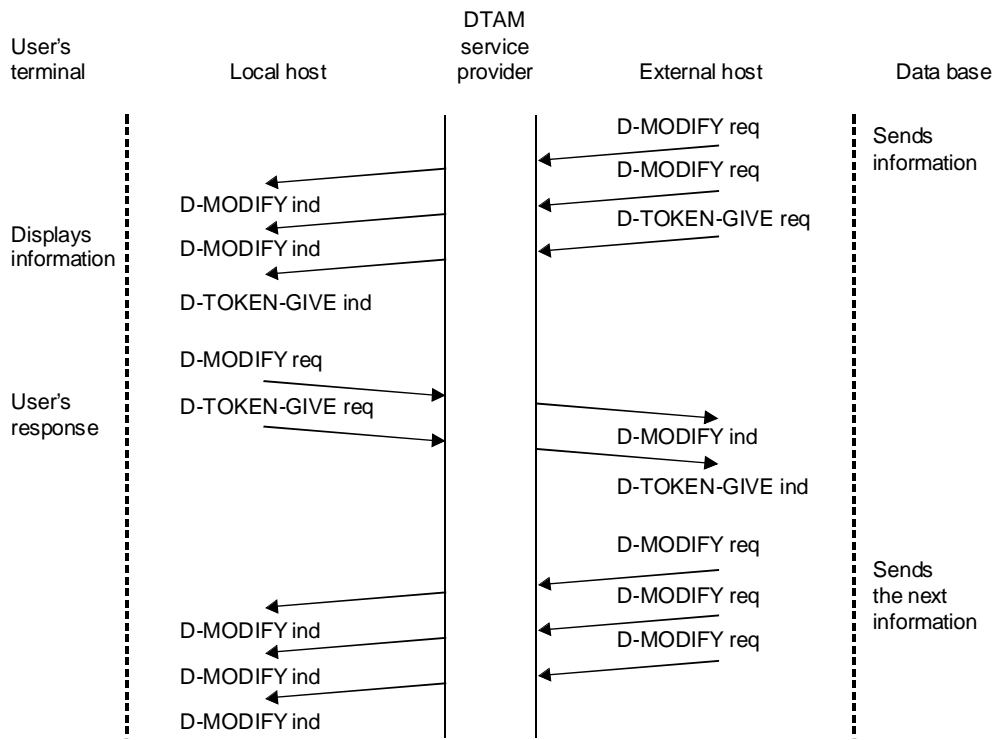
The EH gives the token to the LH to enable the LH to send the entered data.

The LH gives the token to the EH after having completed the data entry (i.e. after having initiated the appropriate D-MODIFY corresponding to the SEs concerned with data entry). Examples are given in Figures 2 and 3.

7.4.3.4 Operation of data entry in duplex mode (type 4)

When the data entry type attribute of the DATA-ENTRY-PROGRAM-SE is set the data entry type 4, the LH sends the entered data and the termination reason in D-TYPED-DATA with the termination reason associated. The data token remains assigned to the EH. An example is given in Figure 4.

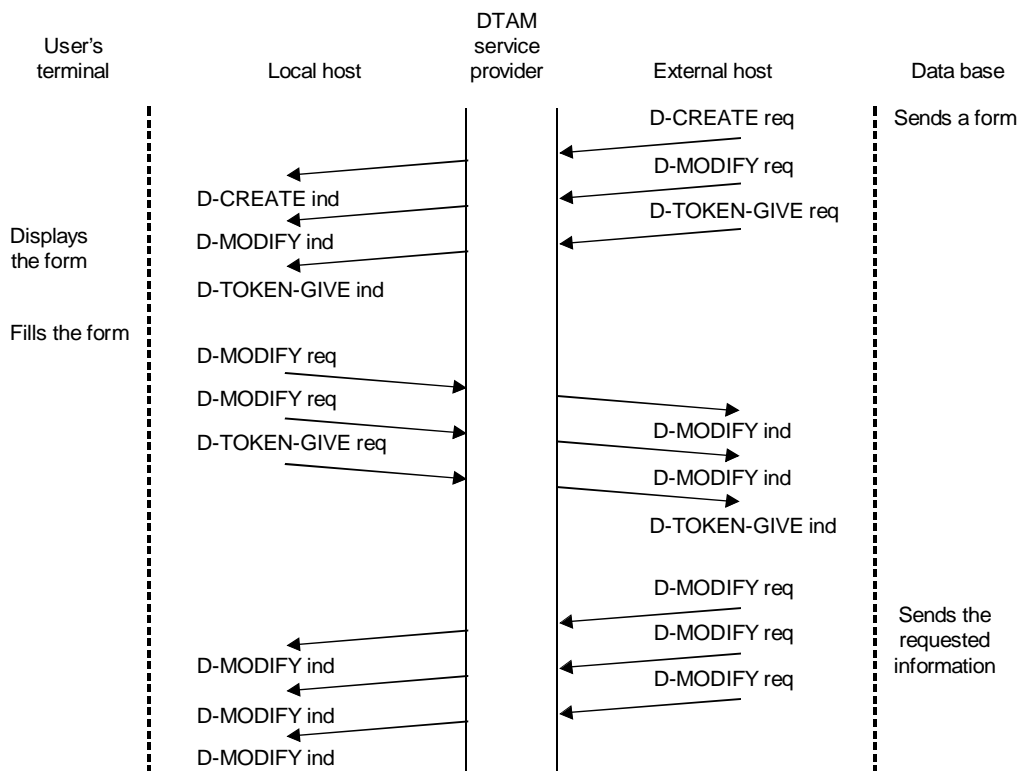
When the EH resets the data entry type attribute to another type (1, 2 or 3) under the condition that both modes are available at the LH, the LH stops sending data in D-TYPED-DATA and uses again D-MODIFY to send the entered data. The EH ignores the possible colliding D-TYPED-DATA.



T0818550-94/d02

FIGURE 2/T.523

Example of data entry in type 1 or 3
(Information retrieval or on the fly: half duplex)



T0818560-94/d03

FIGURE 3/T.523

Example of data entry in type 2
(Data collection: half duplex)

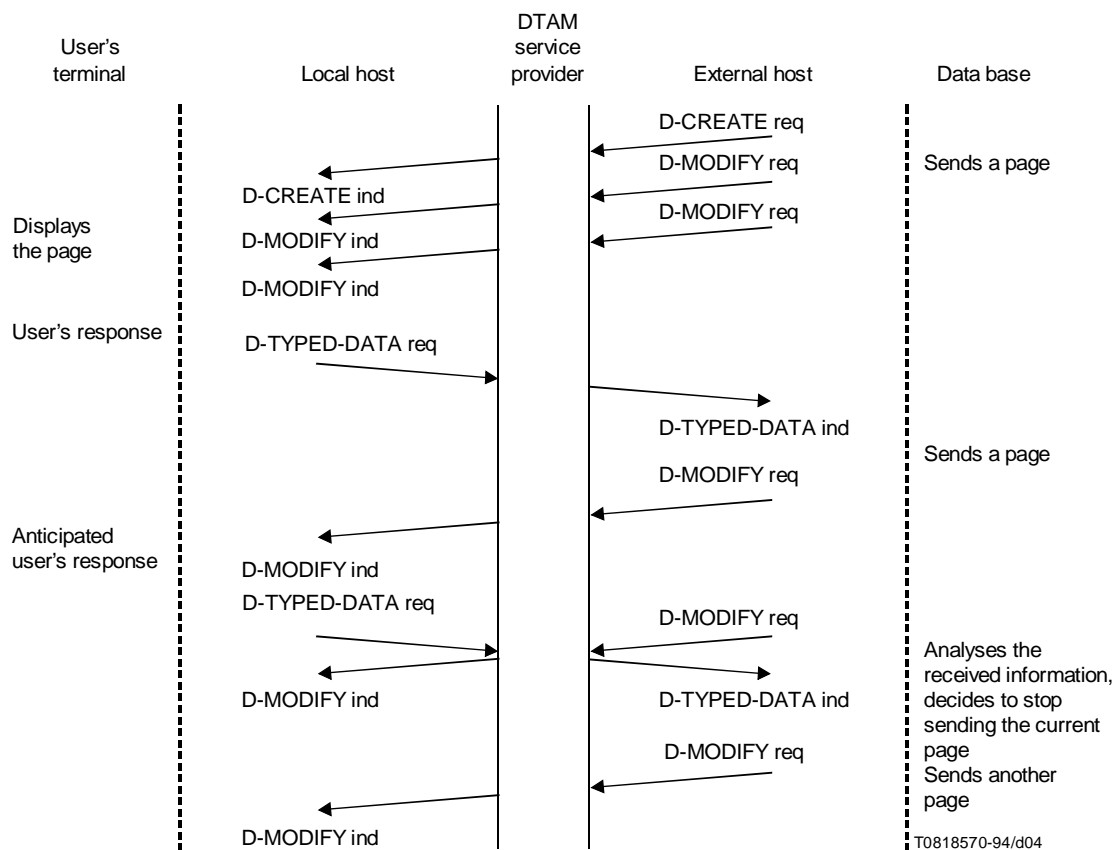


FIGURE 4/T.523
Example of data entry in type 4
 (Duplex)

7.4.3.5 Switching of entry type

The entry type is modified by the EH when sending a D-MODIFY, D-CREATE, D-DELETE or D-REBUILD for the DATA-ENTRY-PROGRAM-SE.

After sending such a D-MODIFY, the EH may send further VIA operations via DTAM manipulation, if required, and should send the token, even when switching to data entry type 4, in order to indicate to the LH the end of entry type redefinition and to permit echoing of characters (if any).

When receiving a primitive which redefines the data-entry type, the LH should stop sending information and consider all information from the videotex user as typed ahead information. The sending of information is resumed when receiving the data token. If the new defined data entry type is 1, 2 or 3, the token remains assigned to the LH until the entry is entirely performed. If the new defined data entry type is 4, the token is immediately sent back to the EH.

The echoing of characters is started after the reception of the data token depending on the value of the echo attribute. The echoing is stopped in modes 1, 2, 3 when sending back the data token after completion of the data entry. The echoing is only stopped in mode 4 after redefinition of a new data entry mode (or modification of the echo attribute).

Examples are given in Figures 5 and 6.

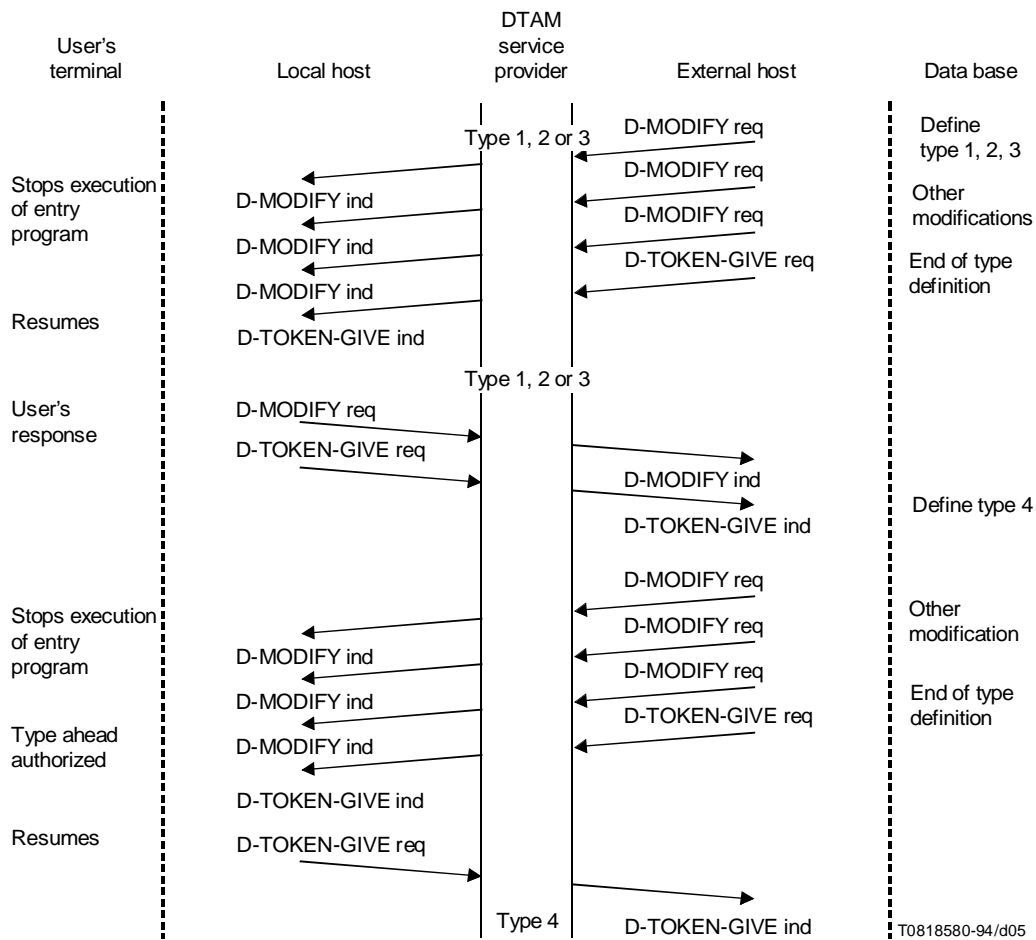


FIGURE 5/T.523
Example of mode switch

7.4.4 Manipulation of application control memory information

The EH manipulates the application control memory information which is represented in accordance with the application control memory SE and its subordinates SEs defined in Recommendation T.564 via the DTAM document manipulation services in order to record the sequence of VIA operations to be repeatedly invoked. This transmission should be done under the token control.

7.4.5 Manipulation of special terminal facilities information

The EH manipulates the special terminal facilities information which is represented in accordance with the application special terminal facilities SE and its subordinate SEs defined in Recommendation T.564 via the DTAM document manipulation services in order to set the special terminal facilities such as characters of DRCS. This transmission should be done under the token control.

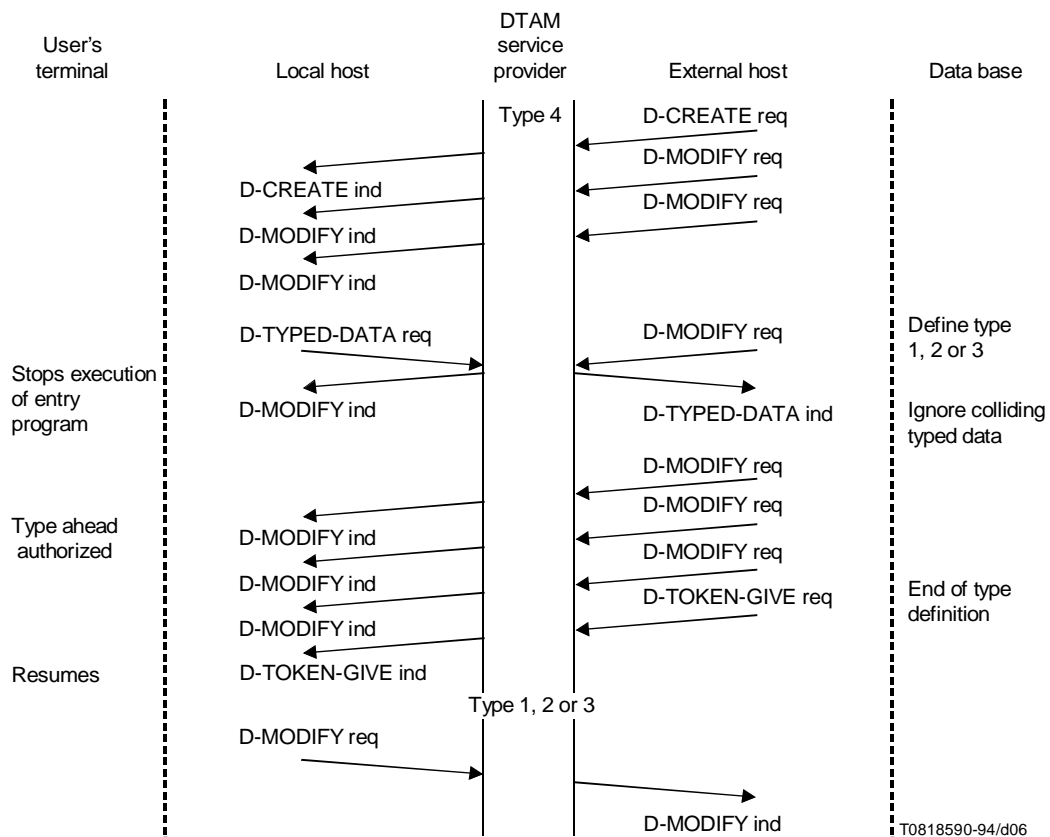


FIGURE 6/T.523
Example of mode switch

7.4.6 Manipulation of administrative information

The EH manipulates administrative information which is represented in accordance with the administrative SE and its subordinate SEs defined in Recommendation T.564 via the DTAM document manipulation services in order to manage the accounting and the identification aspects. This transmission should be done under the token control.

NOTE – Administrative information is for further study in the Recommendation T.564.

7.4.7 Exchange of over limit information

The exchanging over limit information is for further study.

7.4.8 Transmission of asynchronous message

The EH transmits the asynchronous message indicting the warnings (e.g. “close host within 5 minutes”) to the LH. The transmission of this message is not dependent of the data token and the message is conveyed by the DTAM TYPED-DATA service.

8 Elements of procedure

8.1 Application-association establishment

8.1.1 General

Either the LH or the EH establishes an application-association in accordance with the D-INITIATE service described in Recommendation T.432. The purpose of the application-association establishment is:

- to identify the remote peer videotex hosts;
- to exchange the videotex application capabilities such as document application profile;
- to implicitly set the initial VIA between peer videotex hosts.

8.1.2 Service primitives used

The following D-INITIATE service primitives, defined in Recommendation T.432, are used:

- D-INITIATE request;
- D-INITIATE indication;
- D-INITIATE response;
- D-INITIATE confirm.

8.1.3 D-INITIATE service parameters

The service parameters defined in Table 2/T.432 are basically used. The semantics of these parameters are given below. The use of the parameters which are not defined in this Recommendation but listed in Table 2/T.432 is bound to the Recommendation X.217 or X.216.

1) *Telematic requirements*

The following functional units defined in Recommendation T.432 are used:

- kernel (association control);
- typed data transfer;
- document unconfirmed manipulation;
- token management.

If the telematic requirements proposed by the LH are not acceptable to the EH, the videotex application-association establishment fails by responding with a "reject" result parameter.

2) *Application capabilities*

This parameter contains the following sub-parameters:

a) *Document application profile*

The value of this parameter is an object identifier which indicates the document application profile being used. Its value is 0 1 8 16 0 (object identifier).

b) *Operational application profile*

The value of this parameter is an object identifier which indicates the operational application profile being used. Its value is 0 1 8 16 2 (object identifier).

3) *Account*

The use of the account parameter depends on the ongoing work of CCITT Study Group I on this topic.

4) *Result*

The field can take one of the following symbolic values:

- accepted;
- rejected by responder (reason-not-specified);
- rejected by responder (applicationCapabilities-not-supported);
- rejected by responder (protocolVersion-not-supported);
- rejected by responder (application-context-name-not-supported);
- rejected by responding DTAM-PM.

5) *Vi-Initiate-Information (Vi-Init-Information)*

This is the user information associated with the initiation of application association. This contains the following parameters:

a) *Videotex interworking protocol version*

This parameter identifies the version of videotex interworking protocol being used. The value is represented by bit string.

b) *Inactivity timer*

This parameter identifies the time for inactive period to terminate the videotex application-association because of its inactivity. The value of this parameter is subject to the agreement between both hosts. If the values which are exchanged are different from each other, the value which is indicated by the EH is in effect for that association.

c) *Data entry mode*

This parameter identifies the capabilities of the data entry modes to indicate to the peer host. Normally, this parameter is issued by the LH, and may not be used by the EH. The value is represented by integers 1, 2 and 3 which means half-duplex data entry mode, duplex data entry mode and half-duplex/duplex data entry modes respectively.

d) *Bilateral management*

This attribute is reserved for information which is exchanged between the two gateways and can be based on bilateral agreement.

The Vi-Init-information described by the ASN.1 is defined in Annex A.

6) *Called application entity title*

This parameter, which is composed of a called application-process title and a called application-entity qualifier, is used as defined in Recommendation X.217. This identifies the external-host-identifier or the local-host-identifier.

7) *Calling application entity title*

This parameter, which is composed of a calling application-process title and a calling application-entity qualifier, is used as defined in Recommendation X.217. This identifies the local-host-identifier or the external-host-identifier.

8) *Application context name*

This parameter is used as defined in Recommendation X.217. The initiator of the application-association shall propose one of the application-contexts for the videotex interworking (see Recommendation T.101) in the D-INITIATE request primitive. The responder shall either accept the application-context proposed by the initiator and return the same value of this parameter in the D-INITIATE response primitive, or shall return a result parameter with the value “rejected (permanent)” and a diagnostic parameter with the value “application context name not supported”.

9) *Presentation context list*

The presentation context definition list comprises a presentation-context-definition for each abstract-syntax included in the application-context, i.e. one each for the videotex interworking, the DTAM and the ACSE. A presentation-context-definition comprises a presentation-context-identifier and an abstract-syntax-name for the ASE.

8.1.4 DTAM-PM parameters

DTAM-PM parameters are set by the DTAM-PM to D-INITIATE and D-INITIATE PDUs indicating the characteristics of DTAM-PM as follows. These parameters are not issued by the LH and the EH, but are generated by the protocol machines when required:

1) *DTAM protocol version*

DTAM protocol version parameter identifies the version of DTAM protocol being used. The value is represented by bit string (0) which means version-1.

2) *Storage capacity*

The storage capacity parameter identifies the memory size which is available to the DTAM-PM. This parameter is exchanged independently from both directions in order to indicate the own memory size.

8.1.5 Initial VIA

The following VIA structure elements (SEs) are implicitly created in both hosts at the videotex application-association establishment. The videotex communication starts with the initial VIA to manipulate for the videotex dialogue between the LH and the EH:

- DOCUMENT-SE;
- DATA-ENTRY-SE;
- APPLICATION-CONTROL-MEMORY-SE;
- ADMINISTRATIVE-INFORMATION-SE;
- SPECIAL-TERMINAL-FACILITIES-SE.

8.2 Application-association termination

8.2.1 General

Either the LH or the EH requests a normal termination of current videotex application-association in accordance with the D-TERMINATE service described in Recommendation T.432.

8.2.2 Service primitives used

The following D-TERMINATE service primitives, defined in Recommendation T.432, are used:

- D-TERMINATE request;
- D-TERMINATE indication;
- D-TERMINATE response;
- D-TERMINATE confirm.

8.2.3 D-TERMINATE service parameters

The D-TERMINATE service parameters are for further study.

8.3 Application-association abort

8.3.1 General

The LH or the EH requests an abrupt termination of the ongoing videotex application-association in accordance with the D-ABORT service described in Recommendation T.432.

8.3.2 Service primitive used

The following D-ABORT service primitives, defined in Recommendation T.432, are used:

- D-ABORT request;
- D-ABORT indication.

8.3.3 D-ABORT service parameters

The following service parameter is used as defined in the Recommendation T.432.

1) *Vi-Abort-Information*

This parameter is the user information associated with the abort of application association and contains the following sub-parameter:

- *Error-code*

This parameter indicates the reason of the abort.

a) Error-Report-To-Local-Host attributes (issued by the EH):

- inactivity time-out;
- unrecoverable errors.

b) Error-Report-To-External-Host attributes (issued by the LH):

- unrecoverable errors

The Vi-abort-information described by ASN.1 is defined in Annex A.

8.4 Data transmission

The data transmission procedure is realized by DTAM document manipulation service and typed data service. Document manipulation service should be invoked under the token control by using DTAM token document manipulation, data token control and typed data services for videotex gateway application.

8.4.1 Document manipulation procedure

8.4.1.1 General

VIA operations, defined in Recommendation T. 564, should be directly mapped into the relevant DTAM document manipulation services, D-CREATE, D-MODIFY, D-DELETE and D-CALL services defined in Recommendation T.432. These services provide the following communication functions:

- manipulation of display structure information;
- manipulation of date entry structure information;
- manipulation of application control memory information;
- manipulation of special terminal facilities information;

- manipulation of administrative information (for further study);
- exchange of over limit information (for further study).

NOTE – The use of D-REBUILD service is for further study.

8.4.1.2 Service primitives used

The following D-CREATE, D-DELETE, D-MODIFY and D-CALL service primitives defined in Recommendation T.432, are used:

- D-CREATE request;
- D-CREATE indication;
- D-DELETE request;
- D-DELETE indication;
- D-MODIFY request;
- D-MODIFY indication;
- D-CALL request;
- D-CALL indication.

NOTE – The use of these service primitives bounds to the rule defined in clause 9.

The above document manipulation is managed under the token control by using the following D-TOKEN-PLEASE and D-TOKEN-GIVE service primitives:

- D-TOKEN-PLEASE request;
- D-TOKEN-PLEASE indication;
- D-TOKEN-GIVE request;
- D-TOKEN-GIVE indication.

8.4.1.3 Service parameters for document manipulation

8.4.1.3.1 D-CREATE service parameters

- *Create information*

This parameter consists of a sequence of objects as defined in Recommendations T.504 and T.541.

NOTE – If the object identifier carried by the create operation does already exist in the structure, the relevant object in the structure and all subordinates are deleted and the create operation is executed.

8.4.1.3.2 D-DELETE service parameters

- *Delete information*

This parameter consists of a sequence of object or class identifiers, content portion identifiers and operation elements identifiers and defined in Recommendations T.504 and T.541.

NOTE – If the object identifier carried by the operation does not exist in the structure, the delete operation is ignored.

8.4.1.3.3 D-MODIFY service parameters

- *Modify information*

This parameter is a sequence of objects as defined in Recommendations T.504 and T.541.

NOTE – If the object identifier carried by the operation does not exist in the structure, the modify operation is ignored.

8.4.1.3.4 D-CALL service parameters

- *Call information*

This parameter is a sequence of choices of current object identifiers which are defined in Recommendation T.541. The CALL information consists of the designation of a RECORD-SE in the application control memory structure element as defined in Recommendation T.564. This record contains the VIA operations.

8.4.2 Data token control procedure

8.4.2.1 General

Document manipulation services are invoked under the data token control provided by the DTAM token control function, and the owner of the data token has the right to manipulate the VIA.

8.4.2.2 Dialogue rules

The dialogue between the LH and the EH is bound by the following rules:

- 1) The initial data token is set to the EH at the videotex application-association establishment.
- 2) The data token may be given by the EH to the LH at the end of a sequence of VIA manipulations in order to enable the LH to send the entered data in the data entry types 1, 2 or 3.
- 3) In the data entry types 1, 2 or 3 the LH gives the data token to the EH after having sent the sequence of VIA manipulations corresponding to the entered data.
- 4) If the data token is not owned by the LH or EH, that host may issue the D-TOKEN PLEASE to request the data token. The host which receives the D-TOKEN PLEASE may or may not react on the D-TOKEN PLEASE.
- 5) In the data entry type 4, the EH may send the token to the LH in order to switch to data entry types 1, 2 or 3 (see 7.4.3.3).

8.4.2.3 D-TOKEN GIVE service parameters

D-TOKEN GIVE service has no parameters.

8.4.2.4 D-TOKEN PLEASE service parameters

- Tokens priority

This parameter defines the priority of the action, governed by the data token, that the requestor of the D-TOKEN PLEASE service wishes to carry out. This parameter has to be supplied by the requestor of the D-TOKEN PLEASE service.

8.4.3 TYPED-DATA transmission

8.4.3.1 General

Typed data transmission is used independent of the data token and is issued from both hosts (DTAM users) when required. This procedure may be used for the transmission of warning message indicating the warning from the EH and for the transmission of the user entered data in data entry type 4 from the LH.

8.4.3.2 Service primitives used

The following D-TYPED-DATA service primitives, defined in Recommendation T.432, are used:

- D-TYPED-DATA request;
- D-TYPED-DATA indication.

8.4.3.3 D-TYPED-DATA service parameters

This is the octet string information which represents the following ViTypedData:

```
ViTypedData ::= CHOICE {
    asyncMessage [0] IMPLICIT INTEGER
                    {    warnTimeout          0),
                      serviceClose1Minute  (1),
                      serviceClose5Minutes (2) },
                    -- Other values are for further study.
    entryResponse 1] IMPLICIT EntryResponse }
entryResponse ::= SEQUENCE {
    [0] IMPLICIT Termination-Reason,
        -- identical with the coding of termination reason in RESULT-SE
    [1] IMPLICIT Operational-Content-Type OPTIONAL,
        -- identical with the coding of operational content-type of RESULT-SE
    [2] IMPLICIT OCTET STRING OPTIONAL
        -- identical with operational-element-content }
```

8.4.4 Order of the VIA-DTAM manipulation

The order of the VIA operations via DTAM manipulation (VIA-DTAM manipulation for short) is basically followed by the interchange data format defined in Recommendations T.504 and T.541. That is, in principle, VIA should be manipulated from the higher order of structure element, however, the order of display information represented by ODA and the other videotex specific information represented by operational structure is dependent of the local rule and is not defined in this Recommendation.

The following exceptional order of the VIA-DTAM manipulation is defined:

- a) VIA-DATM manipulation concerning data entry SE appears before all the other VIA-DTAM manipulations.
- b) All VIA-DTAM manipulations concerning REDEFINITION-ENTITY-SEs appear before all VIA-DTAM manipulations concerning BLOCK SEs.
- c) All VIA-DTAM manipulations concerning BLOCK SEs appear before all VIA-DTAM manipulations concerning FIELD SEs.

9 Actions of the EH and the LH

9.1 EH action

The EH provides the videotex frame to be displayed on the user's terminal by manipulating the display structure of the VIA through DTAM manipulations.

NOTE – Although the action of displaying information on a videotex terminal is outside the scope of this Recommendation, it is assumed in the Recommendation that:

- 1) the display of Redefinition-Entity-SEs, Block-SEs and Field-SEs is in natural order, whereby Redefinition-Entity-SEs precede Block-SEs and Field-SEs;
- 2) only those parts of the display structure which are created or modified in a dialogue step are redisplayed in that dialogue step (i.e. deletion and recreation of Page-SE is assumed to trigger redisplay of the full screen, whereas modification of a Block-SE or Field-SE is assumed to trigger display of the new block or field content on the existing screen picture);

- 3) deletion of a Block-SE or Field-SE has no effect on the screen;
- 4) this may result in different behaviour of the local repeat functions.

In addition to providing the videotex frame, the EH controls the videotex dialogue by defining a data entry program to be executed by the LH. This is provided by the manipulation of the data entry structure of the VIA through DTAM manipulations. The EH may leave the data entry structure unchanged, implying reuse of the data entry program for the next dialogue step.

If a data entry program is of the “data entry type 2: data collection”, it refers to a form made up of the fields where the user enters data. If the data entry program is of the “data entry type 1: information retrieval”, it refers to an implicit field, defined by the national videotex service of the LH, where the user enters videotex commands.

The data entry program contains the description of the form, and it contains the reaction, called rules to userw’s input the LH has to follow. Moreover, one or two guidance messages (prompts) may be associated with each field. This message will be displayed by the LH each time user enters the field.

9.2 LH action

9.2.1 Report to the EH

The user input form (if any), which may consist of one or more data input fields, is reported to the EH after execution of a data entry program together with the status of the data entry program.

Each field of the form respectively the implicit field used for command entry is associated with a single data entry sub-program, which is executed when data is to be entered into the field.

The data entry program is terminated implicitly by the termination of the last data entry program or explicitly by some user action.

The report to the EH consists of:

- a) the termination status of the data entry program;
- b) the text contents of the fields and the number of the last sub-program executed;
- c) the text contents associated with a command.

The report is performed by the manipulation of the display structure and the data entry structure, updating field text content attributes and attributes belonging to the RESULT-SE and RESULT-Content-Portion.

9.2.2 Local actions

When a data entry program is active, some local actions may be directly supported by the LH to allow for correction of mistyping, cancel of an entry and local frame repeat for instance. Such local actions as well as the local management of user errors (e.g. entry of characters not allowed in the data entry program) are treated in the LH and not reported to the EH.

9.3 List of permissible actions on VIA structure elements in both hosts

Table 1 lists up the permissible actions on VIA structure elements for both hosts. The structure elements marked by (I) are automatically generated at the association establishment phase. On the other hand, the structure elements marked by (E) and (L) are generated by the EH and the LH respectively and are transmitted by the DTAM manipulation services which are indicated at the top of the row on Table 1.

Additionally, a default value list attribute contained in the specific SEs is only defined at the stage of SE create, and is not taken into account after the creation.

TABLE 1/T.523

DTAM Manipulation VIA	D-CREATE	D-MODIFY	D-DELETE	D-CALL
Document profile	Ⓘ	ⓔ		
Display				
Document layout root	Ⓘ	ⓔ		
Page	ⓔ	ⓔ	ⓔ	
Block	ⓔ	ⓔ	ⓔ	
Content portion	ⓔ	ⓔ	ⓔ	
Operational profile (For further study.)				
Data entry				
Data entry	Ⓘ/ⓔ	ⓔ	ⓔ	
Field	ⓔ	ⓔ	ⓔ	
Field-content portion	ⓔ	Ⓛ/ⓔ	ⓔ	
Data-entry program	ⓔ	ⓔ	ⓔ	
Data-entry sub-program	ⓔ	ⓔ	ⓔ	
Rules	ⓔ	ⓔ	ⓔ	
Prompt	ⓔ	ⓔ		
Prompt-content portion	ⓔ	ⓔ		
Result	Ⓘ	Ⓛ		
Result-content portion	Ⓘ	Ⓛ		
Application control memory				
Application control	Ⓘ/ⓔ		ⓔ	
Memory record	ⓔ	ⓔ	ⓔ	ⓔ
Administrative				
Administrative information	Ⓘ			
Local host information	Ⓘ	Ⓛ		
External host information	Ⓘ	ⓔ		
Document information	Ⓘ	ⓔ		
Special terminal facilities				
Special terminal facilities	Ⓘ			
Redefinition entity	ⓔ	ⓔ	ⓔ	

10 Object identifier

The value of object identifier for communication application profile DM-1 defined in this Recommendation is 0 1 8 16 1.

Annex A

Abstract syntax definition of videotex specific information

(This annex forms an integral part of this Recommendation)

A.1 Encoding of user information associated with D-INITIATE services

The following syntax is carried by the user information of the D-INITIATE and the D-INITIATE PDUs as octet string:

```
ViInitInformation ::= SEQUENCE {  
    protocolVersion [0] IMPLICIT INTEGER  
        {viProtocolVersion1 (1)},  
    inactivityTimeout [1] IMPLICIT INTEGER OPTIONAL,  
    dataEntryMode [2] IMPLICIT INTEGER OPTIONAL  
        {halfDuplexDataEntryMode (1)  
        duplexDataEntryMode (2)  
        halfDuplex/duplexDataEntryMode (3)  
        -- the EH may not use this parameter }  
    bilateralManagement [3] IMPLICIT OCTET STRING OPTIONAL  
}
```

A.2 Encoding of user information associated with D-ABORT services

The following syntax is carried by the user information of the D-ABORT REQ PDU as octet string:

```
ViAbortInformation ::= CHOICE {  
    errorReport [0] IMPLICIT INTEGER  
        -- used for Error-Report-to-LH and Error-Report-to-EH;  
        -- NOTE – the total length of this PDU must not be  
        -- greater than 4 octets to be compatible with the  
        -- requirements for the ACSE ABORTpdu.  
}
```