



INTERNATIONAL TELECOMMUNICATION UNION

**CCITT**

THE INTERNATIONAL  
TELEGRAPH AND TELEPHONE  
CONSULTATIVE COMMITTEE

**V.120**

(09/92)

**DATA COMMUNICATION  
OVER THE TELEPHONE NETWORK**

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**SUPPORT BY AN ISDN OF DATA TERMINAL  
EQUIPMENT WITH V-SERIES TYPE  
INTERFACES WITH PROVISION  
FOR STATISTICAL MULTIPLEXING**



**Recommendation V.120**

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Qualcomm Incorporated v. Rembrandt Wireless Techs. LP.

## FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT 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 Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation V.120 was revised by Study Group XVII and was approved under the Resolution No. 2 procedure on the 18th of September 1992.

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## CCITT NOTES

- 1) In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized private operating agency.
- 2) A list of abbreviations used in this Recommendation can be found in Annex B.

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**SUPPORT BY AN ISDN OF DATA TERMINAL EQUIPMENT  
WITH V-SERIES TYPE INTERFACES WITH PROVISION  
FOR STATISTICAL MULTIPLEXING**

*(revised 1992)*

## **1 Scope**

This Recommendation describes a protocol that can be used for adapting terminals with non-ISDN standard network interfaces to an ISDN. It is intended to be used between two terminal adaptor (TA) functional groups, between two ISDN terminal (TE1) functional groups, between a TA and a TE1, or between either a TA or TE1 and an interworking facility inside a public or private ISDN. It provides for operation:

- a) over either circuit-mode or frame-mode connections;
- b) using either demand or semi-permanent establishment of communications; and
- c) over any of the following types of access channel:
  - for circuit-mode connections: B, H<sub>0</sub>, H<sub>10</sub> or H<sub>11</sub>
  - for frame-mode connections: B, H<sub>0</sub>, H<sub>10</sub>, H<sub>11</sub> or D.

This Recommendation also describes how this protocol is related to synchronous and asynchronous interface specifications using the interchange circuits defined in Recommendation V.24. It is not intended to be a functional specification for an implementation of any system containing a TE1 or TA functional group. Except as explicitly noted, it is restricted to the definition of the protocol at the user-network interface (reference points S, T or U) and the ISDN-side interface of the interworking function (IWF).

The terminal adaption protocol in this Recommendation may be used in support of three classes of non-ISDN-terminal protocols. These are:

- 1) Asynchronous (start/stop) protocols, supported using the protocol sensitive asynchronous mode;
- 2) Synchronous protocols using high level data link control procedure (HDLC) frame format, supported using the protocol sensitive synchronous mode;
- 3) Synchronous protocols, supported using the bit transparent mode.

The use of the bit transparent mode with frame mode connections is for further study.

## **2 Application**

### *2.1 General*

The protocols described in this Recommendation may be used by a TE1, TA or IWF, as illustrated in Figure 1/V.120. The formats and procedures contained in this Recommendation are defined in terms of their operation across interfaces at reference points S, T or U, or (in the case of an IWF) across interfaces that may be internal network interfaces. Where necessary to promote compatibility, the relationship between the terminal adaption protocol and existing protocols at the interface at reference point R (where present) are also described.

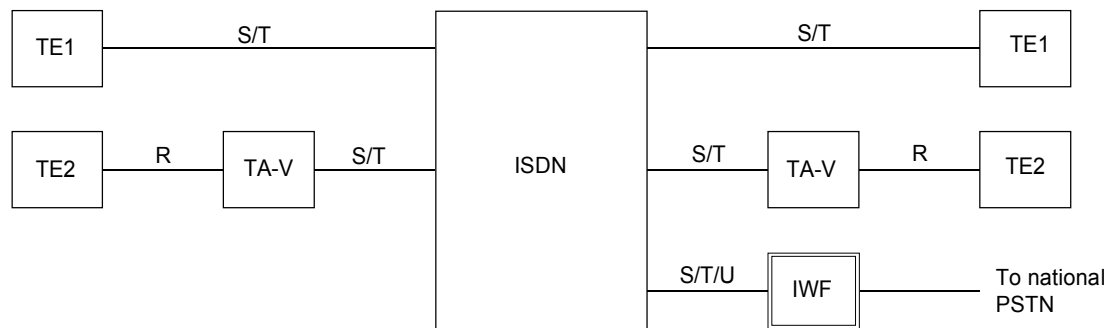
### *2.2 Connectivity*

Two or more terminal adaption connections may be multiplexed across a circuit-mode bearer connection or frame-mode access connection. These connections are referred to in this Recommendation as “logical links”. Logical links supporting different modes of the terminal adaption protocol may be multiplexed across the same circuit switched bearer connection or frame-mode access connection. Constraints on the number of logical links (up to the

maximum number that can be coded in the Address field) and the combinations of modes supported by a circuit switched bearer connection or frame-mode access connection are implementation dependent and are beyond the scope of this Recommendation.

The protocol sensitive modes (1 and 2 above in § 1) of this Recommendation may be used to support dissimilar rates (i.e. when used between two TAs, the data rates at the interfaces at reference point R may be different). The use of buffering, application of the flow control protocol in this Recommendation, use of flow control procedures at the R reference point, use of discarding and other strategies for support of dissimilar rates are implementation dependent.

Parameter exchange procedures may be defined to allow interworking between terminal adaptors (TAs) in an environment where multiple different TA protocols are used without requiring interworking functions within the network. Interworking between different types of TAs can be accomplished with multiprotocol terminal adaptors (MTAs) that are capable of supporting more than one protocol. However, interworking functions may be used when TAs are not capable of supporting more than one protocol.



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- TE1 ISDN data terminal equipment
- TE2 Data terminal equipment (DTE) with non-ISDN interfaces
- TA-V V.120 terminal adapter supporting V-Series TE2s
- IWF Interworking function
- S/T S or T architectural reference points at which physical interfaces of concern may be implemented.
- PSTN Public switched telephone network

FIGURE 1/V.120  
ISDN connection scenarios

### 2.3. Protocol architecture

Figure 2/V.120 shows the protocol architecture of the U-plane, defined for the purposes of this Recommendation. The protocol defined in this Recommendation may be viewed as having the physical layer and three sublayers: the core sublayer, the data link control sublayer and the adaption sublayer. The core sublayer and the data link control sublayer are subdivisions of the data link layer (see Recommendation X.212). The adaption sublayer may

also be considered a subdivision of the data link layer (though it may alternatively be viewed as a thin layer 3) This layering is in alignment with Recommendation I.233, "ISDN frame mode bearer services".

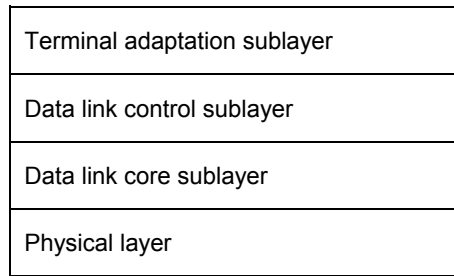
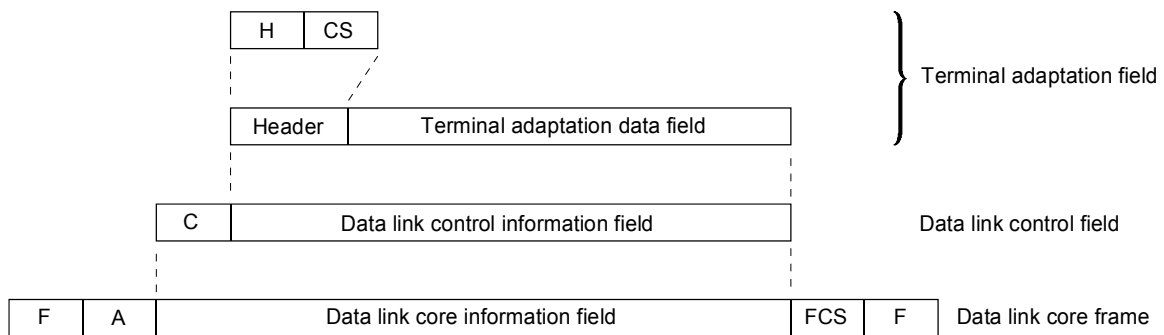


FIGURE 2/V.120

**Protocol layers used in this Recommendation**

Figure 3/V.120 shows how the layering of Figure 2/V.120 maps to the frame formats of this Recommendation.



- F HDLC flag
- A Address
- FCS Frame check sequence
- C Control (HDLC format)
- H Header octet (optional for bit transparent mode)
- CS Optional header extension for control state information

FIGURE 3/V.120

**Relationship between layering and frame formats**

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