INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

V.110

(09/92)

DATA COMMUNICATION OVER THE TELEPHONE NETWORK

SUPPORT OF DATA TERMINAL EQUIPMENTS WITH V-SERIES TYPE INTERFACES BY AN INTEGRATED SERVICES DIGITAL NETWORK

Recommendation V.110

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

_____

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.

Recommendation V.110[1])

SUPPORT OF DATA TERMINAL EQUIPMENTS WITH V-SERIES TYPE INTERFACES BY AN INTEGRATED SERVICES DIGITAL NETWORK

(Malaga-Torremolinos, 1984; amended at Melbourne, 1988, revised 1992)

The CCITT,

considering

(a)   that the ISDN will offer the universal interfaces to connect subscriber terminals according to the reference configuration described in Recommendation I.411;

(b)   that during the evolution of ISDN, however, there will exist for a considerable period data terminal equipment (DTEs) with V-Series type interfaces which have to be connected to the ISDN;

(c)   that bearer services supported by an ISDN are described in Recommendation I.211;

(d)   that the D-channel signalling protocol is described in Recommendations I.430, I.441/Q.921 and I.451/Q.931;

unanimously declares the view

(1)   that the scope of this Recommendation shall cover the connection of terminals with interfaces for modems conforming to current V-Series Recommendations on the ISDN operating in accordance with circuit switched or leased circuit services;

(2)   that the following circuit switched service capabilities shall be supported:

–   data transmission; (or)

–   alternate speech/data transmission; (and/or)

–   automatic calling and/or automatic answering;

(3)   that the reference configurations of § 1 shall apply;

(4)   that the support of interworking of terminal equipments (TEs) on an ISDN with DTEs on other types of networks, e.g. public switched telephone network (PSTN), is described in the Recommendations I.500-Series;

(5)   that the terminal adaptor (TA) functions necessary to support the connection of DTEs with V-Series type interfaces on an ISDN, shall include the following:

–   conversion of electrical and mechanical interface characteristics;

–   bit rate adaptation;

–   end-to-end synchronization of entry to and exit from the data transfer phase;

–   call establishment and disestablishment based on either manual or automatic calling and/or automatic answering.

1   Reference configurations

1.1   *Terminal adaptor reference model*

The terminal adaptor functions have been defined in the context of a simple reference model. Annex A describes the reference model in further detail, and defines a basic terminal adaptor TA-A, and an auto-calling/autoanswering terminal adaptor TA-B.

_____

[1])   This Recommendation is also included in the Recommendations of the I-Series under the number I.463.

1.2　*Connection types*

　　The terminal adaptor functions described in this Recommendation take into account interworking between TAs of different types, e.g. V-Series TE2 with X.21 TE2, and end-to-end connections of different types. These are described in further detail in Annex A.

2　Line signals at S and T reference points

　　The TA signals at ISDN reference points S or T shall be in conformance with the characteristics of an ISDN's "Basic user/network interface" as described in Recommendation I.430 (layer 1 specification), I.441/Q.921 (layer 2 specification) and I.451/Q.931 (layer 3 specification).

2.1　*Bit rate adaptation of synchronous data signalling rates up to 19.2 kbit/s*

2.1.1　*General approach*

　　The bit rate adaptation functions within the TA are shown in Figure 1/V.110. The functions RA1 converts the user data signalling rate to an appropriate intermediate rate expressed by $2^k \times 8$ kbit/s (where $k = 0$, 1 or 2). RA2 performs the second conversion from the intermediate rates to 64 kbit/s. The data signalling rates of 48 and 56 kbit/s are converted directly into the 64 kbit/s B-channel rate.

2.1.2　*Adaptation of V-Series data signalling rates to the intermediate rates*

　　The intermediate rate used with each of the V-Series data signalling rates are shown in Table 1/V.110.

　　Note – The specific V-Series data signalling rate(s) to be supported by an ISDN are for further study.
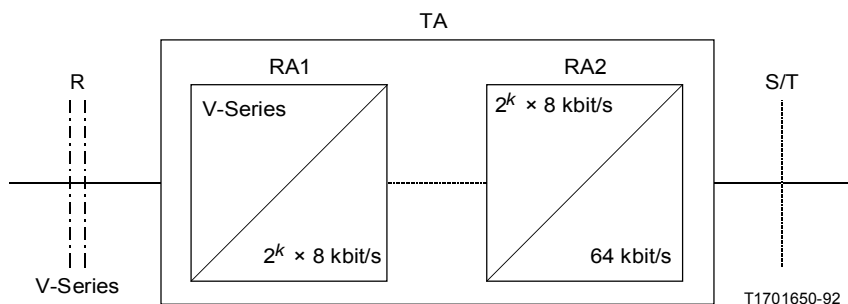

FIGURE　1/V.110

Two step bit rate adaptation

First step rate adaptation

Data signalling rate (bit/s)	Intermediate rate		
	8 kbit/s	16 kbit/s	32 kbit/s
600	X		
1 200	X		
2 400	X		
4 800	X		
7 200		X	
9 600		X	
12 000			X
14 400			X
19 200			X

2.1.2.1   *Frame structure*

The frame structure is shown in Table 2/V.110 and is described in the following paragraphs.

As shown in Table 2/V.110, the conversion of the V-Series rates to the intermediate rates uses an 80-bit frame. The octet zero contains all binary 0, whilst octet 5 consists of a binary 1 followed by seven E bits (see § 2.1.2.4). Octets 1-4 and 6-9 contain a binary 1 in bit number one, a status bit (S- or X-bit) in bit number 8 and six data bits (D-bits) in bit positions 2-7. The order of bit transmission is from left to right and top to bottom.

TABLE 2/V.110

Frame structure

Octet number	Bit number							
	1	2	3	4	5	6	7	8
0	0	0	0	0	0	0	0	0
1	1	D1	D2	D3	D4	D5	D6	S1
2	1	D7	D8	D9	D10	D11	D12	X
3	1	D13	D14	D15	D16	D17	D18	S3
4	1	D19	D20	D21	D22	D23	D24	S4
5	1	E1	E2	E3	E4	E5	E6	E7
6	1	D25	D26	D27	D28	D29	D30	S6
7	1	D31	D32	D33	D34	D35	D36	X
8	1	D37	D38	D39	D40	D41	D42	S8
9	1	D43	D44	D45	D46	D47	D48	S9

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.