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SERIES V: DATA COMMUNICATION OVER THE
TELEPHONE NETWORK

Transmission quality and maintenance

**Procedures for the simultaneous transmission
of data and digitally encoded voice signals over
the GSTN, or over 2-wire leased point-to-point
telephone type circuits**

ITU-T Recommendation V.70

(Previously "CCITT Recommendation")

ITU-T V-SERIES RECOMMENDATIONS
DATA COMMUNICATION OVER THE TELEPHONE NETWORK

- 1 – General
- 2 – Interfaces and voiceband modems
- 3 – Wideband modems
- 4 – Error control
- 5 – Transmission quality and maintenance**
- 6 – Interworking with other networks

For further details, please refer to ITU-T List of Recommendations.

FOREWORD

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

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

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NOTE

1. In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.
2. The status of annexes and appendices attached to the Series V Recommendations should be interpreted as follows:
 - an *annex* to a Recommendation forms an integral part of the Recommendation;
 - an *appendix* to a Recommendation does not form part of the Recommendation and only provides some complementary explanation or information specific to that Recommendation.

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Recommendation V.70

PROCEDURES FOR THE SIMULTANEOUS TRANSMISSION OF DATA AND DIGITALLY ENCODED VOICE SIGNALS OVER THE GSTN, OR OVER 2-WIRE LEASED POINT-TO-POINT TELEPHONE TYPE CIRCUITS

(Geneva, 1996)

1 Scope

This Recommendation describes the technical requirements for a Digital Simultaneous Voice and Data (DSVD) terminal, for operation over the General Switched Telephone Network (GSTN) or 2-wire telephone type leased circuits.

The major characteristics of a DSVD terminal are:

- the simultaneous transmission of data¹⁾, e.g. file transfer or T.120 information, and digitally encoded voice signals over a single GSTN connection or over 2-wire leased point-to-point telephone-type circuits;
- the ability to enter the DSVD operating mode either at call set-up, or during an analogue telephone connection;
- multiplexing of bidirectional voice and data channels using a V.42 [8] LAPM-based multiplexing technique described in Recommendation V.76 [11]; and
- transmission of the multiplexed bit stream using the modulation technique defined in Recommendation V.34 [7] or V.32 bis [6].

The DSVD terminal may consist of one physical unit, or alternatively, the functional elements of the terminal may be partitioned between a number of physical units.

This Recommendation defines DSVD operation over a point-to-point connection. Multipoint communication may be achieved, for example using a separate multipoint control unit, but the characteristics of this device are not covered by this Recommendation.

2 Normative references

The following Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- [1] ITU-T Recommendation G.729, Annex A²⁾, *Reduced complexity 8 kbit/s CS-ACELP speech coder*.
- [2] ITU-T Recommendation H.245 (1996), *Control protocol for multimedia communication*.
- [3] ITU-T Recommendation V.8 bis (1996), *Procedures for the identification and selection of common modes of operation between Data Circuit-Terminating Equipments (DCEs) and between Data Terminating Equipments (DTEs) over the general switched telephone network and on leased point-to-point telephone-type circuits*.
- [4] CCITT Recommendation V.25 bis (1988), *Automatic calling and/or answering equipment on the General Switched Telephone Network (GSTN) using the 100-series interchange circuits*.

¹⁾ See Recommendation H.324 for the simultaneous transmission of audio and video information.

²⁾ Presently at the stage of draft.

- [5] ITU-T Recommendation V.25 *ter* (1995), *Serial asynchronous automatic dialling and control*.
- [6] CCITT Recommendation V.32 *bis* (1991), *A duplex modem operating at data signalling rates of up to 14 400 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits*.
- [7] ITU-T Recommendation V.34 (1994), *A modem operating at data signalling rates of up to 28 800 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits*.
- [8] ITU-T Recommendation V.42 (1993), *Error-correcting procedures for DCEs using asynchronous-to-synchronous conversion*.
- [9] CCITT Recommendation V.42 *bis* (1990), *Data compression procedures for Data Circuit-Terminating Equipment (DCE) using error correction procedures*.
- [10] ITU-T Recommendation V.75 (1996), *DSVD terminal control procedures*.
- [11] ITU-T Recommendation V.76 (1996), *Generic multiplexer using V.42 LAPM-based procedures*.
- [12] ITU-T Recommendation V.80 (1996), *In-band DCE control and synchronous data modes for asynchronous DTE*.

3 Definitions

For the purposes of this Recommendation, the following definitions apply.

- 3.1 audio blocking factor:** The number of information blocks, i.e. coded samples, from the speech coder which are combined and transmitted in a single multiplex frame. The default value is "1".
- 3.2 DSVD terminal:** A DCE/DTE combination which together comply with the requirements of this Recommendation and its associated Recommendations. All the functionality of a DSVD terminal may be implemented within the DCE alone.
- 3.3 initiator:** A role taken on by the control entity and multiplex function that determines how it operates for various functions. The role is determined from the V.8 *bis* procedures and is the same as the initiator role for V.8 *bis*.
- 3.4 responder:** A role taken on by the control entity and multiplex function that determines how it operates for various functions. The role is determined from the V.8 *bis* procedures and is the same as the responder role for V.8 *bis*.

4 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used:

ADP	Answerer Detection Pattern
API	Application Programming Interface
CE	Control Entity
DCE	Data Circuit-Terminating Equipment
DLC	Data Link Connection
DLCI	Data Link Connection Identifier
DSVD	Digital Simultaneous Voice and Data
DTE	Data Terminal Equipment
DTMF	Dual Tone Multiple Frequency
ERM	Error Recovery Mode
GSTN	General Switched Telephone Network
IP	Internet Protocol

LAPM	Link Access Procedure for Modems
MF	Multiplex Function
ODP	Originator Detection Pattern
PPP	Point-to-Point Protocol
SAP	Service Access Point
SCF	Supervisory and Control Function
UNERM	Unacknowledged Non-Error Recovery Mode

5 DSVD system

5.1 System overview

A general model of a DSVD terminal is shown in Figure 1. This is an abstract model and is not intended to restrict practical implementations.

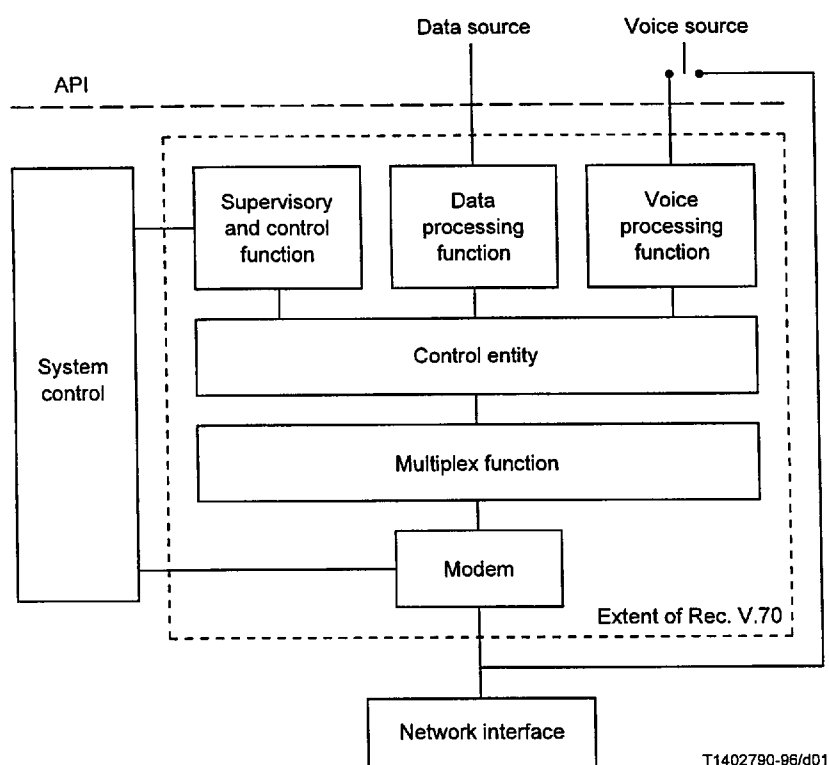


FIGURE 1/V.70

A V.70 system shall include as a minimum the following functional elements, and a compliant V.70 implementation is required to incorporate the functionality of each of these elements:

- *Supervisory and Control Function (SCF)*

The SCF is responsible for the control of the DSVD system (see 5.2).

- *Data processing function*

The data processing function is responsible for converting the user data into a format suitable for handling by the multiplex function, e.g. the conversion of start-stop framed data to a format suitable for synchronous transmission. The data channel(s) may be synchronous or asynchronous, and the protocols and applications supported may be indicated and negotiated using the DSVD control entity.