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SERIES V: DATA COMMUNICATION OVER THE
TELEPHONE NETWORK

Interfaces and voiceband modems

**Synchronous and asynchronous automatic
dialling procedures on switched networks**

ITU-T Recommendation V.25 *bis*

(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

The ITU-T (Telecommunication Standardization Sector) is a permanent organ of the International Telecommunication Union (ITU). 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, 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).

ITU-T Recommendation V.25 *bis* was revised by ITU-T Study Group 14 (1993-1996) and was approved by the WTSC (Geneva, October 9-18, 1996).

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.25 *bis* (10/96)

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Recommendation V.25 bis

SYNCHRONOUS AND ASYNCHRONOUS AUTOMATIC DIALLING PROCEDURES ON SWITCHED NETWORKS

(revised in 1996)

1 Scope

1.1 This Recommendation specifies procedures for setting up data connections employing synchronous and asynchronous applications on switched networks. Users may wish to note that for asynchronous applications, an alternative procedure is specified in Recommendation V.25 *ter* which includes additional functionality for controlling and configuring DCEs. Means are provided in this Recommendation for the encapsulation of commands, indications and messages specified for the V.25 *ter* protocol.

1.2 This Recommendation describes the sequence of events involved in establishing a connection between an automatic calling data station¹⁾ and an automatic answering data station for DCEs specified for operation on switched networks. The system configuration is shown in Figure 1.

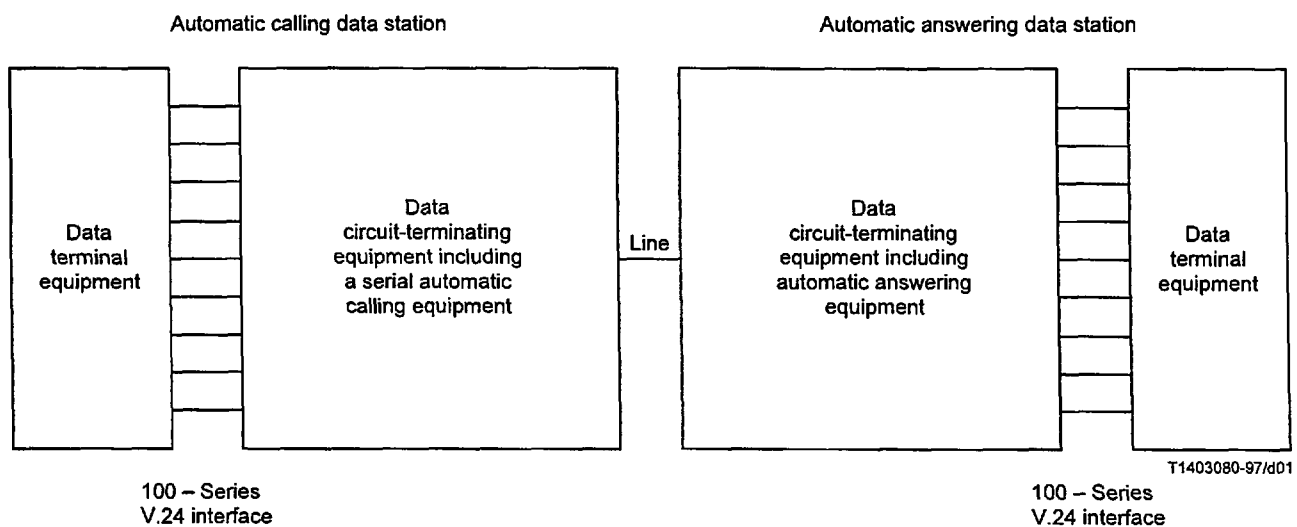


FIGURE 1/V.25 bis

1.3 The procedures are intended to be suitable for the following three types of call:

- serial automatic calling data station to automatic answering data station;
- manual calling data station to automatic answering data station;
- serial automatic calling data station to manual answering data station.

It is intended that data terminal equipment designed to control automatic calling equipment in accordance with this Recommendation will also be suitable for use with manually controlled data circuit-terminating equipment, and also that data circuit-terminating equipment incorporating serial automatic calling equipment may be manually controlled where necessary.

1.4 The procedures described herein allow automatic calling equipment conforming to this Recommendation to interwork with automatic answering equipment conforming to Recommendation V.25.

¹⁾ In this Recommendation, the term "data station" is synonymous with the term "terminal installation for data transmission".

1.5 The data terminal equipment is responsible:

- a) during call establishment:
 - i) for ensuring that the data circuit-terminating equipment is available for operation;
 - ii) for providing the telephone number or selecting a telephone number pre-programmed into the data circuit-terminating equipment;
 - iii) for deciding to abandon the call if it is unsuccessfully completed;
- b) after call establishment:
 - i) for controlling data transfer;
 - ii) for initiating disconnect at calling or answering data stations.

1.6 This Recommendation deals with call establishment and clearing. Any specific use of Recommendation V.24 interchange circuits herein described only applies during these phases. The management of interchange circuits and the line during the data transmission phase is not part of this Recommendation.

Details of interface procedures following the OFF to ON transition of circuit 107 on entry of the data transmission phase can be found in the relevant modem Recommendations.

1.7 Annex A gives guidance on the maintenance facilities which may be associated with an automatic calling data circuit-terminating equipment. Methods for testing the automatic calling functions of the data circuit-terminating equipment are included.

2 Abbreviations and definitions

The following abbreviations are used in this Recommendation:

DCE	Data Circuit-terminating Equipment
DTE	Data Terminal Equipment

The following definitions apply to this Recommendation:

2.1 **command:** An instruction issued by the DTE to the DCE as part of the automatic calling procedure.

2.2 **indication:** An instruction or response issued by the DCE to the DTE as part of the automatic calling procedure.

NOTE – In this Recommendation the terms “indication” and “response” are not to be taken in the sense defined in Recommendation X.210.

2.3 **parameter:** A variable which may accompany Commands or Indications.

2.4 **automatic calling:** A procedure by which a DTE, by use of certain V.24 interchange circuits, instructs the DCE associated with it to perform the call establishment function.

3 General

An automatic calling and/or answering data station in accordance with this Recommendation can be operated in two modes:

- The “addressed call and/or answer authorized by the DTE (circuit 108/2)” mode gives a calling data station extensive facilities by means of instructions and indications exchanged between the DTE and the DCE on circuits 103 and 104. It gives an answering data station the capacity to accept “*a priori*” an incoming call.
- The “direct call and/or answer controlled by the DTE (circuit 108/1)” mode gives a calling data station the capacity of calling a number (or a sequence of numbers) pre-recorded in the DCE, by means of the 108/1 control circuit. It gives an answering data station the capacity of accepting incoming calls on a “per call” basis.

NOTE – Although automatic answering data stations as well as automatic calling and answering data stations may implement both modes of operation, they should be configured to operate in a specific one of the two modes.

4 Addressed call and/or answer authorized by the DTE (circuit 108/2)

4.1 Interface procedure

4.1.1 Interchange circuits involved

The interchange circuits used in this automatic calling/answering procedure are listed in Table 1. Their use during the automatic calling/answering procedures is described below.

TABLE 1/V.25 bis

Interchange circuit		Direction	
Number	Name	from DCE	to DCE
103	Transmitted data		X
104	Received data	X	
106	Ready for sending	X	
107	Data set ready	X	
108/2	Data terminal ready		X
125	Calling indicator	X	

4.1.1.1 Circuit 103 – Transmitted data

The instructions issued by the DTE during the automatic calling procedure, known as *commands*, are transmitted to the DCE on this circuit.

4.1.1.2 Circuit 104 – Received data

Responses from the DCE to DTE Commands, known as *indications*, are transmitted to the DTE on this circuit. Optionally, circuit 104 may convey the echo of the commands transmitted on circuit 103.

4.1.1.3 Circuit 106 – Ready for sending

The DCE shall turn circuit 106 ON in response to the DTE's circuit 108/2 being ON.

The DCE shall turn circuit 106 OFF:

- i) on connection to line when answering tone is detected;
- ii) when the DCE aborts the call set-up under the control of DTE by turning 108/2 in the OFF condition.

4.1.1.4 Circuit 107 – Data set ready

The DCE shall turn circuit 107 ON:

- i) at the end of the automatic call set-up procedure, to indicate to the DTE that the connection is established and the DCE connected to line;
- ii) on completion of manual call set-up procedure.

The DCE shall turn circuit 107 OFF:

- i) to indicate to the DTE that the connection has been cleared down during the data transfer phase (to be permitted where national regulations require it);
- ii) in response to a clear request by the DTE turning OFF circuit 108/2.

4.1.1.5 Circuit 108/2 – Data terminal ready

The DTE turns circuit 108/2 ON:

- i) to enable the DCE to set up a connection either manually or automatically;
- ii) to indicate to the DCE that it is ready to accept an incoming call.

The DTE shall turn circuit 108/2 OFF:

- i) to instruct the DCE to clear down the connection during data transfer;
- ii) to instruct the DCE to abort the call set-up procedure;
- iii) to indicate to the DCE that it is not ready to accept an incoming call.

4.1.1.6 Circuit 125 – Calling indicator

The DCE shall provide circuit 125 to indicate to the DTE an incoming call. This incoming call will override a call request prior to seizure of the line. The usage of circuit 125 in the DTE is optional.

4.1.1.7 Other interchange circuits

The state of other interchange circuits is not part of the procedure. However, to ensure maximum compatibility with existing equipment, the other interchange circuits provided should retain their normal function during the automatic calling procedure.

Particularly to ensure correct operation of the DTE, the condition of circuit 109 shall follow the condition of circuit 106.

The DTE may choose to hold circuit 105 ON during the automatic calling procedure, but the DCE is not required to recognize this condition.

4.1.2 Control information format

Call set-up is achieved by the use of interchange circuits 106, 107 and 108 together with messages exchanged between the DTE and the DCE on circuits 103 and 104. These messages consist of commands or indications from the DTE or DCE respectively, and may be accompanied by *parameters* where necessary. The commands/indications required for the automatic calling procedure are outlined in Tables 2 and 3 together with their parameters.

The use of commands/indications other than one of the call request commands (CR_) and the invalid indication (INV) is optional in the DTE and DCE respectively.

The commands/indications and their parameters are described below.

4.1.2.1 Call request commands

These commands from the DTE instruct the DCE to initiate a call set-up procedure. The commands shall include a suffix to indicate the type of call request concerned (see Table 3) and shall be accompanied by one or more of the following parameters:

- i) the number to be dialled. (In applications where additional dial tones are required, separators, “wait tone”, etc., may be included in this number);
- ii) the identification number of the data station;
- iii) the DCE memory address which contains the number to be dialled, this having been previously programmed.

NOTE – Manufacturers should note that the response time to a Call Request Command is determined by the time required to execute line procedures (see 6.1).

4.1.2.2 Program commands

These commands from the DTE instruct the DCE to enter a programming state. The commands shall be accompanied by one or more of the following parameters:

- i) the DCE memory address into which the number to be dialled is to be stored;
- ii) the number which is to be stored;
- iii) the identification number of the data station.

Where a DCE does not contain the programming capability, this DCE shall reply to a program command by an *invalid* indication.

Where a DTE is not capable of programming the DCE, it may still initiate call attempts using the *call request* command in the normal way.

4.1.2.3 List request commands

These commands from the DTE instruct the DCE to list the numbers that have been programmed in its memory with or without their status. The commands shall include a suffix to indicate the type of list concerned. The command may be accompanied by parameters to select items to be listed. These parameters are for further study.

4.1.2.4 Disregard incoming call command

This command from the DTE instructs the DCE not to answer the current incoming call which is, or has been, signalled from the DCE to the DTE.

4.1.2.5 Connect incoming call command

This command from the DTE instructs the DCE to connect an incoming call that has been disregarded due to a previous disregard incoming call command.

4.1.2.6 Call failure indication

This indication may be issued by the DCE in response to a *call request* command from the DTE and may be accompanied by a parameter stating the reason for the failure of the call.

The following parameters indicate the possible conditions that may result in a call failure on the GSTN:

- i) engaged tone;
- ii) number not stored;
- iii) local DCE busy, (e.g. DCE involved in an operation invoked from the front panel);
- iv) ring tone, (the remote end was ringing but the call is aborted on time-out);
- v) abort call, (the call is aborted on time-out);
- vi) answer tone not detected, (the other end was recognized as going off-hook but the V.25 answer tone was not detected);
- vii) forbidden call, (call attempts to this number are blocked by the DCE due to national regulations) (see Note);
- viii) other parameters dependent on national network variations.

NOTE – Procedure for clearance of forbidden call numbers is not covered in this Recommendation.

The provision of the *call failure* indication is optional in the DCE. For this reason, the DTE should also be capable of recognizing call failure by means of a time out.

4.1.2.7 Delayed call indication

This indication from the DCE may be implemented depending on national regulations. It informs the DTE that, for example, owing to repeated unsuccessful call attempts, call attempts to this number are blocked by the DCE for a time given by the accompanying parameter.

4.1.2.8 Incoming call indication

This indication may be provided by the DCE to inform the DTE that a ring tone has been detected on the telephone line.

NOTE – In the event of collision between an incoming call and a call request, the incoming call will have priority.

4.1.2.9 Valid indication

This indication may be provided by the DCE to acknowledge call request, program, disregard incoming call and correct incoming call commands, and to inform the DTE that the command has been accepted.