INTERNATIONAL TELECOMMUNICATION UNION

CCITT F.73

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

TELEGRAPH AND MOBILE SERVICES
OPERATIONS AND QUALITY OF SERVICE

OPERATIONAL PRINCIPLES FOR COMMUNICATION BETWEEN TERMINALS OF THE INTERNATIONAL TELEX SERVICE AND DATA TERMINAL EQUIPMENT ON PACKET SWITCHED PUBLIC DATA NETWORKS

Recommendation F.73

Geneva, 1990

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, established 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 F.73 was prepared by Study Group I and was approved under the Resolution No. 2 procedure on the 2nd July 1990.

CCITT NOTE

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

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Recommendation F.73

OPERATIONAL PRINCIPLES FOR COMMUNICATION BETWEEN TERMINALS OF THE INTERNATIONAL TELEX SERVICE AND DATA TERMINAL EQUIPMENT ON PACKET SWITCHED PUBLIC DATA NETWORKS

The CCITT,

considering

(a) the need to allow communication between terminals of the international telex service with terminals on packet switched public data networks;

(b) that Recommendations F.60, F.69 and other relevant Recommendations define the international telex service;

(c) that Recommendation X.121 defines the international numbering plan for public data networks;

(d) that the PAD functions of the telex/packet interworking functions (TPIWF) are in conformance with Recommendations X.3, X.28 and X.29,

unanimously declares the view

1 that there are benefits in standardizing the operational principles for a terminal of the international telex service to communicate, across international boundaries, with a data terminal equipment (DTE) on a packet switched public data network (PSPDN);

2 that where provided, the operational principles to achieve communication should be in accordance with this Recommendation.

1 Introduction

1.1 The procedures defined in this Recommendation enable telex subscribers to communicate with both packet mode and character mode data terminal equipment (DTE) connected to the PSPDN directly or via other networks. In the reverse direction, the provisions of this Recommendation enable users of packet mode and character mode DTEs, connected to a PSPDN directly or via other networks, to communicate with telex subscribers.

1.2 This Recommendation applies to user classes 8-13 and 20-23 as defined in Recommendation X.1. Categories of access for DTEs accessing the PSPDN are shown in Recommendation X.10.

1.3 This Recommendation does not apply to other Telematic services that may be supported by packet switched public data networks and interworking with the telex service.

For example, interworking between the telex service and the teletex service or the interpersonal messaging service is not within the scope of this Recommendation. Such interworking scenarios are defined in other Recommendations.

1.4 Call establishment from a telex terminal via a PSPDN to a character-mode DTE connected to the public switched telephone network (PSTN) requires further study.

2 Operational outline

2.1 Communication shall be in quasi real-time mode and support interactive operation. Delays may be encountered as defined in § 4.1.2.

2.2 The interworking shall be established by the provision of a telex/packet interworking function (TPIWF).

Interworking on an international connection should be via the telex network as shown in Figure 1/F.73.

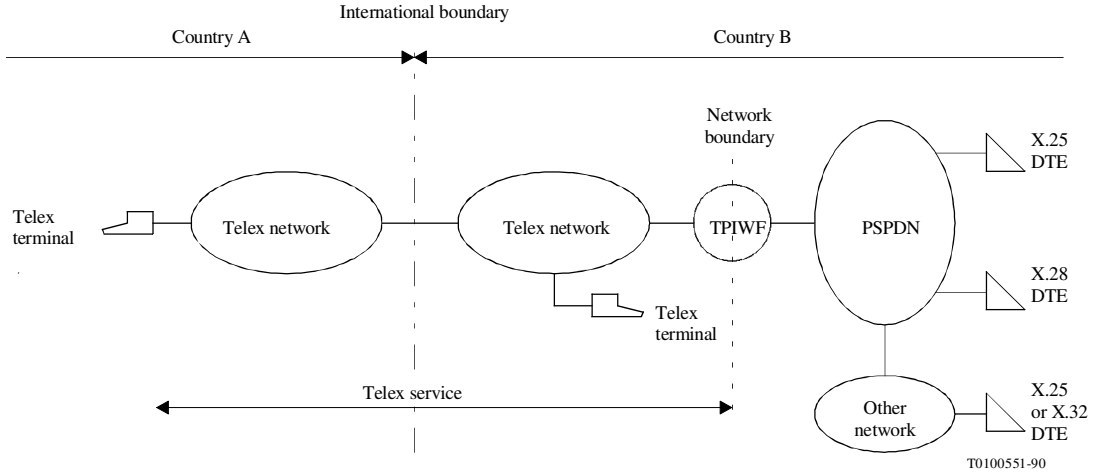

FIGURE 1/F.73

Interworking model

2.3 The point of interworking between the two networks shall be in the same country as the PSPDN.

2.4 In the telex to PSPDN direction, an Administration may implement either/or both one-stage and two-stage call set-up procedures.

Where the DTE is assigned a telex number, or its address is represented as part of the national telex numbering plan of the destination country, one-stage selection may be used.

In all other cases two-stage selection shall be used.

3 Call set-up procedures

3.1 *Telex to PSPDN direction*

3.1.1 *One-stage selection*

3.1.1.1 The length of the number assigned to the DTE shall be in accordance with the relevant U-Series signalling Recommendations.

3.1.1.2 The procedures for selection within the PSPDN are a national matter and not covered by this Recommendation.

3.1.1.3 The call to the TPIWF shall be established using normal telex procedures. The procedures for call establishment within the PSPDN are defined in the relevant X-Series Recommendations.

3.1.1.4 The number assigned to a user in the TPIWF must appear to be part of the national telex numbering plan. The method of verification is a national matter. If the verification fails, the following procedures should be applied:

a) Where the TPIWF is provided by the Administration which also provides all or part of the telex network, the service signal **NP** may be returned.

b) Where the TPIWF is not provided by the Administration which also provides all or part of the telex network, the procedures to be applied shall be in accordance with Recommendation F.74.

3.1.1.5 The answerback returned by the TPIWF to the calling telex terminal at call establishment and during the text transfer phase shall be in accordance with § 4.3.1.1. The answerback shall be returned in accordance with Recommendation S.6.

3.1.2 *Two-stage selection*

3.1.2.1 In the case of two-stage selection, a national telex number should be assigned to the telex/packet interworking function (TPIWF), and the DTE X.121 address should be input in a second stage of selection.

3.1.2.2 Connection to the TPIWF shall be established using normal telex procedures.

3.1.2.3 During the first stage of telex call establishment and until the call connected packet is received, the answerback returned in response to the WRU signal shall be the answerback of the TPIWF.

3.1.2.4 The format of the TPIWF answerback shall be in accordance with Figure 2/F.73 and Recommendation S.6.

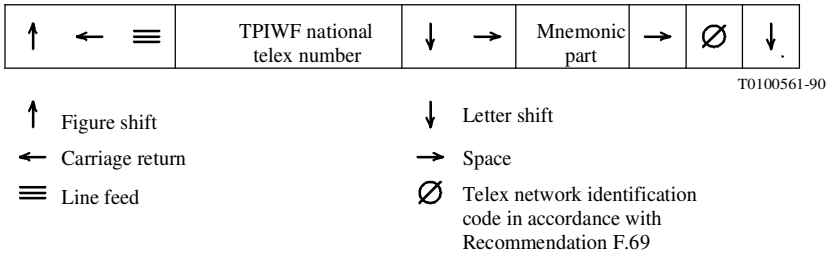

FIGURE 2/F.73

3.1.2.5 After the answerback exchange the telex subscriber shall input the DTE address preferably followed by the character + as an end-of-selection signal. Alternatively, other end-of-selection signals, for example, carriage-return, linefeed, may be used by bilateral agreement.

3.1.2.6 Having received the address of the requested DTE, the TPIWF shall establish the connection across the PSPDN in accordance with national procedures. On call establishment, the TPIWF receives the call connected PAD service signal. This PAD service signal will, whenever possible, include the identification of the called DTE.

3.1.2.7 The procedures for call establishment in the PSPDN are a national matter and not covered by this Recommendation.

3.1.2.8 During the PSPDN call establishment phase, the TPIWF may clear the telex call if the connection through the PSPDN is impossible to establish. Alternatively, the TPIWF may chose not to clear the telex call but to allow the telex user to set up another PSPDN call, possibly with a different DTE. The choice between the two alternatives is a network option.

3.1.2.9 The provision for telex automatic emitting devices (TAEDs) is for further study.

3.2 *PSPDN to telex direction*

3.2.1 Selection procedures from the PSPDN DTE to the TPIWF are a national matter. The TPIWF should establish the telex call using normal telex procedures with telex selection information provided by the calling DTE.

3.2.2 Where an Administration provides one-stage selection in accordance with § 3.1.1 of this Recommendation, only DTEs assigned a telex number are permitted to establish a telex call. The method of verification is a national matter.

3.2.3 The TPIWF may store the identification of the calling DTE for the duration of the call to generate an answerback if requested by the called telex terminal. The format of the answerback is defined in § 4.3.1.1 or Figure 3/F.73, as appropriate.

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Note – For legends see Figure 2/F.73.

FIGURE 3/F.73

Alternatively, as a network option, the TPIWF may respond to a WRU signal received from the telex network with the answerback of the TPIWF formatted in accordance with Figure 2/F.73.

3.2.4 After a successful call establishment to the telex terminal, the TPIWF should indicate call connect to the PSPDN.

3.2.5 If a call is unsuccessful, the TPIWF shall clear the call to the DTE with an appropriate cause code reflecting the received telex service signal. The appropriate cause code is selected from Recommendation X.96.

3.2.6 The handling of the answerback of the called telex subscriber, automatically returned by the telex network to the TPIWF, is a national matter.

3.2.7 Upon receipt of the answerback of the called telex terminal, the TPIWF should transmit the answerback/DTE identification of the calling DTE, or TPIWF answerback, as appropriate, to the called telex terminal.

4 Text transfer phase

The provisions for telex automatic emitting devices (TEADs) in the two-stage selection case is for further study.

4.1 *Telex to packet*

4.1.1 Characters received from the telex network shall be converted in accordance with Recommendation S.18, packetized by the TPIWF, and forwarded to the PSPDN in accordance with Recommendation X.28.

4.1.2 When flow control prevents the forwarding of further data packets, the TPIWF may attempt to flow-control the calling telex terminal in accordance with Recommendation S.4. If this is unsuccessful, the telex call should be cleared.

4.2 *Packet to telex*

4.2.1 The user data received from the DTE by the TPIWF shall be transmitted to the telex subscriber.

4.2.2 The TPIWF shall convert the IA5 characters to ITA2 characters, in accordance with Recommendation S.18, and transmit them to the telex network. The conversion from other character sets to ITA2 is a national matter. The appropriate PAD parameters of the TPIWF shall be set to avoid the occurrence of overprinting at the telex terminal.

4.2.3 The procedures to be followed by the TPIWF when signals are received on the backward path during forward transmission to the telex terminal shall be in accordance with Recommendation S.4.

4.3 *Answerback formats and WRU processing*

4.3.1 *Answerback formats*

4.3.1.1 The DTE answerback format in case of one-stage selection shall be in accordance with Figure 1/F.74.

4.3.1.2 In the case of two-stage selection, the format of the answerback of the TPIWF should be in accordance with Figure 2/F.73 and the DTE identification, where provided, will be the appropriate recall address.

In the telex-to-PSPDN direction, it should be noted that, where the DTE identification is provided, the answerback returned by the TPIWF in the data transfer phase differs from the answerback returned during the call establishment phase and is not, therefore, in conformance with Recommendation F.60.

4.3.2 *WRU processing*

4.3.2.1 If a WRU signal is received from the telex terminal during the data transfer phase, the TPIWF shall return the answerback as defined in either §§ 3.1.1.5, 3.1.2.3 or 3.2.3, as appropriate to the telex terminal.

This answerback shall be returned only when all outstanding data has been transmitted to the PSPDN.

4.3.2.2 The DTE may verify connection to the correct telex terminal by use of the IA5 "ENQ" character as part of a data packet. This should be converted to the ITA2 WRU signal, and transmitted to the telex terminal to trigger the answerback.

The TPIWF shall forward all outstanding data to the telex terminal before transmission of the WRU signal. The first 20 characters received from the telex subscriber after transmission of the WRU signal should be considered to be the answerback, which should then be returned to the DTE.

4.3.2.3 The TPIWF should transmit the answerback to the DTE immediately after its reception.

If no character is received within 2 seconds following transmission of the WRU signal, the TPIWF should continue with text transmission.

4.3.2.4 The responsibility for the action to be taken where an answerback is not returned in response to the IA5 "ENQ" character from the DTE rests with the DTE.

4.3.2.5 The DTE on the PSPDN may also cause the TPIWF to send its answerback to the telex network by sending an IA5 "ACK" character. The answerback should not be forwarded until all outstanding data packets have been transmitted to the telex terminal.

4.4 *Call clearing*

4.4.1 If the telex call is cleared, the TPIWF shall clear the PSPDN call.

4.4.2 If the PSPDN call is cleared, the TPIWF shall clear the telex call where the DTE was the originator of the call. However, in the telex-to-PSPDN direction, the TPIWF may chose not to clear the telex call where the TPIWF offers a follow-on call facility and it has been requested by the originating telex subscriber in the call set-up.

Note — Follow-on calls are only allowed on telex-to-PSPDN calls.

5 Abnormal conditions

The action to be taken when abnormal conditions occur shall be in accordance with the relevant U-Series Recommendations on the telex side of the TPIWF and with the X-Series Recommendations on the PSPDN side of the TPIWF.