The drawings contained in this Recommendation have been done in Autocad

Recommendation T.65

APPLICABILITY OF TELEMATIC PROTOCOLS AND TERMINAL CHARACTERISTICS TO COMPUTERIZED COMMUNICATION TERMINALS (CCTs)

(Melbourne, 1988)

The CCITT,

considering

(a) that there is an increasingly growing base of computerized communication terminals, such as communicating personal computers;

(b) that Administrations will require provisions to enable these devices to access CCITT—defined services, such as telematic services;

(c) that communication of these devices with each other may use provisions specified for communication within telematic services;

(d) that such devices may, due to their adaptive nature, require, in some areas, different protocols and terminal characteristics than existing telematic terminals;

(e) that the various telematic services are defined in the F—Series of Recommendations;

(f) that the reference model for open systems interconnection is defined in the X—200—Series of Recommendations;

(g) that the various telematic protocols and terminal characteristics are defined in the T—Series of Recommendations;

(h) that there is a requirement to assess the applicability of the protocols and terminal characteristics defined in the CCITT telematic recommendations to computerized communication terminals;

unanimously declares the view

that the following technical provisions determine the applicability of protocols and terminal characteristics specified in CCITT Telematic Recommendations to Computerized Communication Terminals.

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1 Scope

1.1 This Recommendation addresses the applicability of the protocol and terminal characteristics specified in CCITT—defined Recommendations to Computerized Communication Terminals (CCTs). It should be observed that the "adaptive" (as opposed to dedicated) nature of CCTs calls for, in certain areas, more flexibility, but without undue degradation of capabilities. The issues of flexibility versus degradation of capabilities strongly influenced the proposals made in this Recommendation.

1.2 This Recommendation specifies how the various telematic Recommendations may be used, and any additional requirements, to enable computerized communication terminals to access the various telematic services. It is noted that while this Recommendation is applicable to CCTs only when accessing telematic services, consideration may be given to the use of the technical aspects of this Recommendation if CCTs communicate with each other utilizing the telematic protocols.

1.3 Section 2 describes the characteristics of computerized communication terminals. The remaining sections define how the relevant telematic Recommendations may be used to enable CCTs to access the telematic services.

1.4 Figure 1/T.65 shows various methods for CCTs to access the telematic services which are described in §§ 3 to 9.

Three methods are proposed:

i) access to and from a telematic service via service access facility (SAF) (see § 3.4.2, for example);

ii) direct access from and to a telematic service;

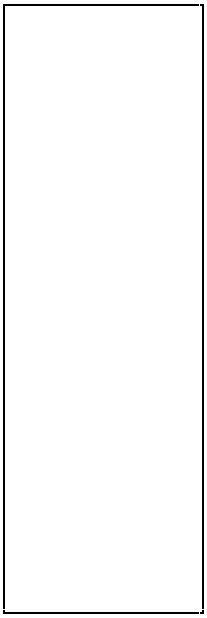
iii) direct access from a CCT to a telematic service, reverse access via SAF (see § 3.4.3, for example).

2 Characteristics and model

2.1 *Definition*

The term Computerized Communication Terminal (CCT) refers to a device or equipment, which may be portable, with a processor and communication facility, typically a user work station, which permits entry of various applications and which can access CCITT—defined services, such as telematics, as prescribed in this Recommendation.

Fig. 1/T.65 T0801251-90= 13 cm



2.2 *Characteristics*

Computerized communication terminals differ in certain characteristics from telematic terminals. The following subsections identify the characteristics of CCTs. Characteristics specific to each case of the access to telematic services are given in §§ 3 to 9.

2.2.1 *Capability*

A CCT maybe used to access the telematic services. The provisions in this Recommendation provide a basic level of compatibility between CCTs and the telematic services.

2.2.2 *Protocols*

In general, CCTs will use OSI protocols defined in the X.200—Series of Recommendations, but configured to meet the requirements defined in the relevant T—Series of Recommendations. Exceptions include the cases of access to the non—OSI—based telematic services, where the relevant T—Series of Recommendations apply.

2.2.3 *Terminal requirements*

In general, the relevant T—Series Recommendations for terminal requirements apply. The details specified to each access to telematic services, and any additional (or relaxed) requirements are specified in §§ 3 to 9.

2.3 *General model*

A model for CCTs accessing telematic services based on OSI is given in Figure 2/T.65. The model identifies the relevant Recommendations applicable to each level in the OSI layers, for each case of access to telematic services.

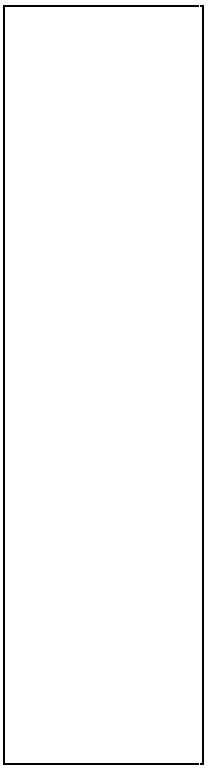
In particular, two sets of protocols are identified for access to OSI—based telematic services:

a) A set of OSI protocols common to most accesses to telematic services is identified for the lower layers up to and including the session kernel in the session layer. The corresponding CCITT Recommendations required are identified.

b) Above the common set of protocols, additional session layer functional units based on Recommendations X.215/X.225 are identified, together with any Recommendations required for each of the cases of the access to telematic services.

There are telematic services which require the use of non—OSI—based protocols. In these cases, the common set of protocols may not be applicable and the relevant T—Series Recommendations must be used.

Fig. 2/T.65 T0801260-87 = 15 cm



2.4 *Minimum capability*

For a CCT to access an OSI—based telematic service it must support all the following capabilities, and any additional capability required for each case of access to telematic service as prescribed in §§ 3, 5, 6, 7, 8 and 9:

a) The appropriate network capability as prescribed in § 3 of Recommendation T.70.

b) X.214/X.224 Class 0 Transport procedure.

c) X.215/X.225 Kernel; together with half—duplex, or full—duplex functional units.

Note — The applicability of the minimum capability to videotex access requires further study.

3 Access to the Teletex service

3.1 *General*

The access of CCTs to the Teletex service is a common case of communication with an OSI—based telematic service due to the well defined nature of Teletex. The following sections describe the characteristics of such an access and specify how the various Teletex—related Recommendations may be used.

3.2 *Characteristics*

3.2.1 From the technical point of view, CCTs will be able to establish communications directly with a Teletex device and exchange documents on a real—time, end—to—end basis without the use of conversion facilities.

3.2.2 As far as possible, CCT access to the Teletex service should be done via message handling systems. The technical implementation is a national matter.

3.2.3 CCTs may not necessarily be available continuously to receive incoming calls. However, when a CCT is available it will be technically able to receive calls directly from and exchange documents with other Teletex devices.

3.2.4 CCTs may technically use the Teletex protocol and terminal characteristics as prescribed in § 3.3 of this Recommendation to exchange Teletex documents with each other.

3.2.5 If a Teletex device communicates with a CCT, it must be made aware of that fact. How this information is conveyed within the Teletex terminal identification with a specific value for Part 3 is described in § 3.4.

3.3 *Applicability of the relevant CCITT Recommendations*

3.3.1 *Protocols*

a) The network capabilities are in accordance with § 3 of Recommendation T.70.

b) The transport procedure is in accordance with either:

— Class 0 of the OSI transport protocol, as specified in Recommendations X.214/X.224, together with application rules to be compatible with and conform to the § 5 and Annexes of Recommendation T.70; or

— Paragraph 5 and annexes of Recommendation T.70.

c) The session layer procedure is in accordance with either:

— Kernel with the functional units minor sync, half—duplex, capability data, activity management, and exceptions specified in Recommendations X.215/X.225 together with application rules to be compatible with and conform to Recommendation T.62; or

— Recommendation T.62.

d) The applicability of higher—layer Recommendations, such as T.300 and T.400, requires further study.

3.3.2 *Terminal requirements and character repertoire*

The terminal requirements and character repertoire specified in Recommendations T.60 and T.61 will apply except for the following:

a) A CCT may or may not support full automatic operation.

b) A CCT must be able to receive and store all characters belonging to the basic Teletex character repertoire. However, only those graphic characters which form the primary character set of the basic Teletex character set as defined in Recommendation T.61 need to be presented.

c) A CCT may require a different terminal identification from that of a Teletex terminal. The format of this identification is defined in § 3.4.3.1.

d) Other items require further study.

3.4 *Access methods*

3.4.1 *Introduction*

This paragraph describes a technical method for CCT access to and from the Teletex service. This access method is based on the assumption that CCTs should enjoy a maximum flexibility and that the service characteristics of Teletex should not be degraded.

These prerequisites imply that the CCT must be supported by a service access facility (SAF) which emulates the Teletex service characteristics and provide for the handling of messages.

3.4.2 *Description of the access method*

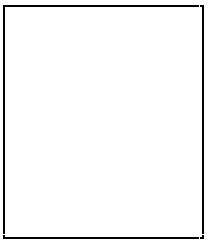
A CCT may establish a connection to the SAF at any time, from any network and from any access point within these networks. If a CCT wants to transmit a message but does not wish to receive a message, it need not be identified. The message will be received by the SAF and forwarded immediately to the Teletex destination. The SAF must add information which will indicate to the Teletex destination that this message was originated by an unidentified CCT.

If a CCT is to receive an answer to its previously transmitted message, it should be able to register itself temporarily using a password. The password will be provided by the CCT user. The message from the CCT will be forwarded immediately to the Teletex destination including information that the answer may be placed in the SAF under the given password. Provisions to allow positive or negative acknowledgements to the Teletex source and to allow control of the status of messages sent by the Teletex source are technically feasible.

In the following, the functions of the SAF are described which are needed to support CCTs for access to/from the Teletex service.

3.4.3 *Model* (see Figure 3/T.65)

Fig. 3/T.65 T0801270-87 = 3 cm



3.4.3.1 *CCT to Teletex*

The following functions will be provided by the SAF in order to enable a CCT to access the Teletex service:

a) insertion of an appropriate information from which the Teletex subscribes can identify that the message is being sent from a CCT (e.g., the letters “CCT” into Part 3 of the Teletex—TID);

b) temporary registration on an optional basis (to allow messages to be sent back to the CCT by a Teletex terminal, see § 3.4.3.2).

3.4.3.2 *Teletex to CCT*

The following functions will be provided by the SAF in order to enable a Teletex terminal to send documents to a CCT:

a) memory for storing messages sent by the Teletex terminal;

b) allocation of stored messages to registration numbers to allow their retrieval by the CCT;

c) means for a delivery notification call to the Teletex terminal to indicate that the CCT has retrieved the message;

d) a time—out mechanism for deleting a message if not retrieved within a certain period of time;

e) additional notification calls (e.g., status of stored messages) are for further study.

4 Access to the Group 3 facsimile service

4.1 *General*

A CCT may be used to access the Group 3 facsimile service.

4.2 *Characteristics*

A CCT accessing the Group 3 facsimile service will operate in accordance with the CCITT Recommendations T.4 and T.30.

4.3 *Applicability of the relevant CCITT Recommendations*

4.3.1 *Protocols*

The requirements defined in the CCITT Recommendation T.30 apply.

4.3.2 *Modulation systems*

The requirements defined in the CCITT Recommendation T.4 apply.

5 Access to the Group 4 facsimile service

(For further study.)

6 Access to the mixed—mode option of the Teletex service

(For further study.)

7 Access to the videotex service

7.1 *General*

A CCT may be used to access the videotex service. Since a videotex service will not distinguish between what type of terminal is connected to it, there are no special requirements for CCTs above those which apply to dedicated videotex terminals.

7.2 *Characteristics*

7.2.1 CCTs accessing the videotex service should emulate videotex terminal characteristics. In the emulation, attention should be given to the profiles, ranks or service reference modes of the videotex terminals concerned as used in the various videotex services. Where insufficient display capabilities are available, a CCT should provide fall—back by graceful degradation of capabilities so that the integrity of the information content is preserved. For example, a wide range of colours may fall back to fewer related colours, or to grey scales, or an accented character may fall back to a character without accent.

7.2.2 Videotex services are interactive and CCTs should be able to transmit and receive data interactively.

7.3 *Applicability of the relevant CCITT Recommendations*

7.3.1 *Protocols*

To be defined.

7.3.2 *Data syntax and terminal requirements*

The requirements defined in CCITT Recommendation T.101 (Annexes B, C and D) apply.

8 Access to MHS

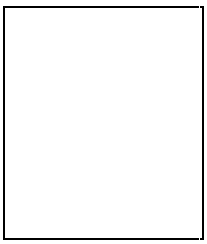
8.1 *General*

This paragraph describes the characteristics of CCTs to access MHS and specifies how the various related Recommendations may be used.

8.2 *Characteristics*

In its present form, the message handling system has as its fundamental component the message transfer system (MTS), which comprises a number of message transfer agents (MTAs). A CCT can then access MHS in two ways as described in Figure 4/T.65 and the text below.

Fig. 4/T.65 T0801280-67 = 3 cm



i) The CCT can access MHS through a telematic interworking facility (TIF) as defined in Recommendations T.300—Series.

ii) The CCT can support the MHS user agent functions to access the MTS directly.

8.3 *Applicability of the relevant CCITT Recommendations*

When a CCT does not support the MHS user agent functions it shall access MHS through a TIF, which provides for interworking between Telematic services and MHS. In this case the relevant sections of Recommendations T.300—Series and T.65 apply, depending on the choice of protocols and terminal characteristics.

When a CCT supports the MHS user agent functions in addition to the Telematic protocols and terminal characteristics, it will use the relevant sections in the series of Recommendations X.400.

9 Access to the directory service

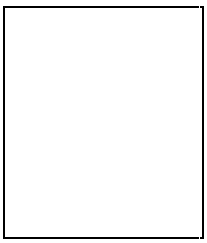
9.1 *General*

The access of CCTs to the directory service will often precede the other CCITT—defined services such as MHS, Teletex, or telephony, in order to determine or ascertain the address of a user or service. This section describes the characteristics of such an access and specifies how the various related Recommendations may be used.

9.2 *Characteristics*

In its present form, the directory system has two fundamental components: the directory user agent (DUA) and the directory (see Figure 5/T.65).

Fig. 5/T.65 T0801290-87 = 3 cm



In terms of this model two ways of CCT access are possible:

i) The CCT can access the DUA using suitable telematic protocols and terminal characteristics defined in the T—Series of Recommendations.

ii) The CCT can support DUA functions to access the directory directly.

It should be noted that directory access is essentially an interactive application. Therefore, this interactive nature influences the protocol and terminal requirements.

9.3 *Applicability of the relevant CCITT Recommendations*

When a CCT does not support DUA functions, it shall access the directory through a DUA. In this case the relevant sections of the Recommendations X.500 and T.65 apply, depending on the choice of protocols and terminal characteristics.

When a CCT supports DUA functions in addition to the Telematic protocols and terminal characteristics it will use the relevant sections in the series of Recommendations X.500.