



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

T.100

TERMINAL EQUIPMENT AND PROTOCOLS FOR TELEMATIC SERVICES

INTERNATIONAL INFORMATION EXCHANGE FOR INTERACTIVE VIDEOTEX

ITU-T Recommendation T.100

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation T.100 was published in Fascicle VII.5 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2 In this Recommendation, the expression “Administration” is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

© ITU 1988, 1993

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the ITU.



Documents
Document Sharing Hub

Recommendation T.100

INTERNATIONAL INFORMATION EXCHANGE FOR INTERACTIVE VIDEOTEX

(Geneva, 1980; amended at Malaga-Torremolinos, 1984)

CONTENTS

Preamble

- 1 Purpose and scope of this Recommendation
- 2 General Videotex coding structure
- 3 Common features
- 4 Representation of alphanumeric characters in a Videotex system
- 5 Alphamosaic option
- 6 Alphageometric option
- 7 Dynamically redefinable character sets (DRCS) option
- 8 Alphaphotographic option
- 9 Service enhancements
- 10 Line and end-to-end protocols
- 11 Interworking with other services

Annex A – The extension scheme of ISO 2022

Annex B – Repertoire of graphic characters

Preamble

The CCITT,

considering

(a) that there is increasing interest in public network-based new interactive information retrieval services using domestic television receivers suitably supplemented, or other apparatus, as terminal equipment;

(b) that the CCIR is studying standards for broadcast *Teletext* services for general reception and has expressed a view that it is desirable that terminal equipment compatibility should exist between broadcast Teletext systems for general reception and public network-based data bank systems;

(c) that such services should be provided over public networks in accordance with CCITT Recommendations and may be required to operate as an international service;

(d) that such services may interwork with terminals provided for text communication services (*Teletex* for example);

(e) that some Administrations intend to have an early introduction of, or have already introduced, public interactive *Videotex* services;

unanimously recommends

that the following technical provisions be applied for international information exchange for interactive Videotex service.

1 Purpose and scope of the Recommendation

1.1 Purpose

1.1.1 The purpose of this Recommendation is:

- a) to facilitate an orderly introduction of early Videotex services (including the continuation of existing services, with a clear identification of potential enhancements) that need to be considered in future developments;
- b) to identify parameters needed to design Videotex terminals; and
- c) to provide technical recommendations desirable for potential interworking of other services with Videotex services.

1.2 Scope

1.2.1 This Recommendation describes the characteristics of coded information that is exchanged between countries participating in the international interactive Videotex service (as described in Recommendation F.300) and defines the display features corresponding to its various elements.

1.2.2 Videotex systems are text communication systems having in addition the capability of a given level of pictorial representation and a repertoire of display attributes. The text and the pictures obtained are intended to be displayed using the current television (TV) raster standards of the different countries.

1.2.3 Different options are offered as a choice for the Administrations to implement their national services. Substantial degrees of compatibility exist between these options, but some transcoding may be necessary to facilitate interworking.

1.2.4 For the international service, four different options for representing pictorial information have been recognized:

- a) mosaic character sets;
- b) geometric system;
- c) dynamically redefinable character sets;
- d) photographic representation.

These options are not mutually exclusive and it is possible that systems may develop using two or more options.

1.2.5 For international interworking, two categories of TV systems have to be considered:

- a) systems having a vertical resolution of 525 lines per TV frame at 30 TV frames per second;
- b) systems having a vertical resolution of 625 lines per TV frame at 25 TV frames per second.

1.2.6 Interworking problems at the pictorial level between countries having different recognized pictorial systems and/or television standards require further study.

1.2.7 This Recommendation is structured as follows:

§§ 1, 2 and 3 deal with the features common to all the options;

§ 4 deals with the coding of characters of the Videotex alphanumeric repertoire defined in Annex B;

§ 5 deals with the alphamosaic option;

§ 6 deals with the alphageometric option;

§ 7 deals with the dynamically redefinable character sets (DRCS) option;

§ 8 deals with the alphaphotographic option;

- § 9 deals with future enhancements and identifies features requiring further study such as: audio, downloaded software, motion, etc.;
- § 10 deals with line and end-to-end protocols;
- § 11 deals with interworking with other services.

Some of these parts have not been completed, and therefore contain guidelines towards future extensions rather than a complete technical specification.

2 General Videotex coding structure

2.1 General

2.1.1 The basis of the coding structure for the Videotex service is Recommendation T.50 and the international standards ISO 2022, ISO 6937 for the 7-bit environment. Specifically, the shift-in code SI (0/15) invokes the G0 set for alphanumeric text mode of operation, and the shift-out code SO (0/14) invokes the G1 set, for all the models (see Annex A). The use of the 8-bit coding scheme is for further study.

2.1.2 In addition to the provisions made by ISO 2022, the transmission of alphabetic characters having diacritical signs is effected by transmitting the code representing the diacritical mark together with the code of the basic alphabetic character.

2.1.3 The different options are designated (and invoked) by specific escape sequences.

2.2 Designation and invocation in the context of the alphamosaic option

2.2.1 Two different modes for the alphamosaic option have been identified. They differ in their display control sets. These control sets are designated as the C1 set by the following control sequences: ESC 2/2 4/0 for the serial mode and ESC 2/2 4/1 for the parallel mode, as assigned by ISO. Individual controls are represented by: ESC F, sequences.

2.2.2 The mosaic graphics set is designated (in the parallel mode) as the G1 set by an escape sequence ESC 2/9 6/3 as allocated by ISO.

2.3 Designation and invocation in the context of the alphageometric option

2.3.1 The alphageometric coding scheme is to be designated and invoked by the escape sequence ESC 2/5 (5/x) in accordance with § 5.3.8 of ISO 2022 standard. This designates and invokes a complete code with interpretation as follows.

2.3.2 All the meanings and interpretation of Recommendation T.50 and ISO 2022 remain the same, including C0, G0 and G2 with the exception of SI and SO. The codes of the G1 set and their meanings and interpretations are as described in § 6.

2.3.3 The designation and invocation of the complete code by the sequence ESC 2/5 (5/x) is to be terminated only by ESC 2/9 (F) or ESC 2/13 (F), designating a normal G1 set.

2.4 Designation and invocation in the context of DRCS

2.4.1 A DRCS is a set of characters whose shapes are sent from the service and down-loaded via the line. It may be used to represent alphabetic characters, special symbols, or picture element symbols for constructing fine graphics. Once loaded, the DRCS are regarded as members of a library that can be designated by appropriate ESC sequences as G0, G1, G2, G3 sets. One scheme is described in § 7 in the context of a general architecture.

2.5 Designation and invocation in the context of the alphaphotographic option

(For further study.)

3 Common features

3.1 General

3.1.1 The features pertaining to individual systems will be described in the corresponding paragraphs. The common features comprise common display features and common control functions.

3.2 Common display features

3.2.1 The *defined display area* is that rectangular position of the display in which all text and pictorial images may be presented (see Figure 1/T.100).

3.2.2 The *border area* is that part of the visible display of a terminal that is outside the defined display area (see Figure 1/T.100).

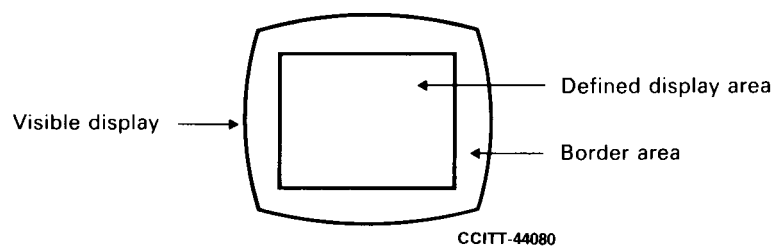


FIGURE 1/T.100
Common display features

3.3 Common format effector and code extension control functions

3.3.1 General

3.3.1.1 The format effector control functions described for the Videotex system permit the active drawing position to be moved on the visible display area. These are taken from the C0 set (see Figure 2/T.100) together with the *Space* character 2/0. In order to permit interworking between Videotex and other text communications services, these control functions have functional compatibility to the extent possible with the basic C0 control set utilized by these other services.

3.3.2 Format effector controls

3.3.2.1 Some of the format effector control functions may be used from terminal to computer with different meanings.

3.3.2.2 Active position backward (APB)

This control function causes the active position to be moved one character position backwards on the same row. APB on the first character position on the row moves the active position to the last character position of the preceding row. APB on the first character position on the first row moves the active position to the last character position of the last row.

3.3.2.3 *Active position forward (APF)*

This function causes the active position to be moved to the next character position forward on the same row. At the last position on the row, this control moves the active position to the first character position on the following row. APF on the last character position of the last row moves the active position to the first character position of the first row.

3.3.2.4 *Active position down (APD)*

This function causes the active position to be moved to the equivalent character position on the following row. APD on the last row moves the active position of the equivalent character position of the first row of the display frame or causes a roll-up to be made.

...

ITU-T Rec. T.100 (1988)

					b_7				b_6			
					0	0	0	0	1	1	1	1
					0	0	1	1	0	0	1	1
					0	1	0	1	0	1	0	1
					0	1	2	3	4	5	6	7
b_4	b_3	b_2	b_1									
0	0	0	0	0	NUL	②						
0	0	0	1	1	②	③						
0	0	1	0	2	②	③						
0	0	1	1	3	②	③						
0	1	0	0	4	②	③						
0	1	0	1	5	ENQ	②						
0	1	1	0	6	②	②						
0	1	1	1	7	①	②						
1	0	0	0	8	APB	CAN						
1	0	0	1	9	APF	SS2						
1	0	1	0	10	APD	①						
1	0	1	1	11	APU	ESC						
1	1	0	0	12	CS	①						
1	1	0	1	13	APR	SS3						
1	1	1	0	14	SO	③						
1	1	1	1	15	SI	③						

CCITT-44090

Note 1 — Reserved for future study.

Note 2 — Reserved for transmission control characters. Their use in Videotex is for further study.

Note 3 — The definitions of these control functions are given in the relevant options.

Note 4 — As in all the code tables in this Recommendation, the shaded positions do not belong to the character set described.

FIGURE 2/T.100

The primary set of control functions for international interactive Videotex

3.3.2.5 *Active position up (APU)*

This function causes the active position to be moved to the equivalent character position on the preceding row. APU on the first row moves the active position to the equivalent character position on the last row of the same display frame.

3.3.2.6 *Clear screen (CS)*

This function causes the screen to be cleared and causes the active position to be moved to the first character position on the first row.

3.3.2.7 *Active position return (APR)*

This function causes the active position to be moved to the first character position of the same row.

3.3.2.8 *Space (SP)*

A control function that causes the active position to be moved one character width forward on the same row. It is also regarded as a graphic character with no foreground. In those systems that define an explicit background, the space copies the background colour into the active position and moves the active position one character width forward. If used in conjunction with the inversion attribute it copies the foreground colour into the active position and moves the active position one character width forward.

3.3.2.9 *Cancel (CAN)*

A control function that fills all the character positions of the row, after the active position, with spaces and returns the active position to its original value.

3.3.3 *Code extension control functions*

3.3.3.1 Code extension control functions are used to expand the capability of the 7-bit code beyond 128 different characters or functions. Code extension functions alter the meaning of a number of characters following them.

3.3.3.2 *Escape (ESC)*

A control character that is used to provide additional control functions other than transmission control functions and that alters the meaning of a limited number of contiguously following bit combinations in the manner specified in Recommendation T.51.

3.3.3.3 *Control sequence introducer (CSI)*

A code extension control function that is used to provide coded representations for additional control functions, in particular for control functions with parameters such as presentation control functions.

3.3.3.4 *Shift-out (SO)*

A control character that is used in conjunction with the *Shift-in* character to extend the graphic character set of the code and that alters the meaning of the bit combinations of columns 2-7 of the code table, until the occurrence of the *shift-in* character, except that the meaning of the bit combinations corresponding to the *space* character and the *delete* character (positions 2/0 and 7/15) are unaffected.

3.3.3.5 *Shift-in (SI)*

A control character, used in conjunction with the *shift-out* character, that reinstates the former meanings of the bit combinations of columns 2-7 of the code table.

3.3.3.6 *Single shift (SS2)*

This character alters the meaning of the single-bit combination following it. That bit combination must be one of those from columns 2-7 except 2/0 and 7/15. The meaning of the bit combination concerned is derived from an appropriately designated G2 graphic set.

3.3.3.7 *Single shift (SS3)*

This character alters the meaning of the single-bit combination following it. That bit combination must be one of those from columns 2-7 except 2/0 and 7/15. The meaning of the bit combination concerned is derived from an appropriately designated G3 graphic set.

3.4 *Miscellaneous*

3.4.1 *Null (NUL)*

This function may occur in non-transparent modes in the received bit stream at the terminal. It shall be regarded as a time filler and discarded.

3.4.2 *Enquiry (ENQ)*

A control character used as a request for a response from a remote station, which response may include station identification and/or station status.

3.5 *Coding of control functions*

3.5.1 A proposed coding of the control functions described is shown in Figure 2/T.100 as a C0 set, except for CSI which is coded in the C1 set.

4 **Representation of alphanumeric characters in a Videotex system**

4.1 *General*

4.1.1 The repertoire for the Latin alphabet is shown in Annex B. The repertoire is derived from ISO 6937. Terminals capable of displaying a subset of the Videotex repertoire shall be permitted.

4.1.2 Character repertoires for non-latin based languages can be accommodated in a similar manner to the latin alphabet. (For further study.)

4.2 *Coding*

4.2.1 Section 4.2 describes the coding of characters the shape of which are stored in the terminal. Some languages require that consecutive letters or diacritical marks will be joined and that no space appear between the characters. When an intersymbol space is required, it will be part of the character description.

4.2.2 The code tables are shown in Figures 3/T.100 and 4/T.100. The code combinations representing characters not included in the Videotex repertoire shall not be transmitted.

4.2.3 All the permitted combinations may be expected in the international exchange of information between two national services. It is the responsibility of Administrations to decide whether this exchange is a direct terminal to database operation or has to be performed through a gateway. See Recommendation F.300.

4.2.4 The graphic characters from columns 2, 3, 5, 6 and 7 of the supplementary set are invoked one at a time by SS2.

4.2.5 A character with a diacritical mark is transmitted by the sequence SS2, a character from column 4 from the supplementary set, and the appropriate character from the primary set. The diacritical marks are non-spacing.

4.2.6 The ISO registration of graphics character sets will indicate any special features such as their use in conjunction with other graphic character sets or non-spacing characters, etc.

4.2.7 For languages based on other than the Latin alphabet further study is required.

5 **Alphamosaic option**

5.1 *General*

5.1.1 In the alphamosaic option, the display frame is composed of defined character positions which may be occupied by any of the characters of the repertoire. The repertoire is composed of the alphanumeric repertoire and a mosaic repertoire. The mosaic repertoire is formed by dividing the character space into a matrix of 2×3 elements. There are 63 different combinations of these elements.

					b ₇	0	0	0	0	1	1	1	1
					b ₆	0	0	1	1	0	0	1	1
					b ₅	0	1	0	1	0	1	0	1
						0	1	2	3	4	5	6	7
b ₄	b ₃	b ₂	b ₁										
0	0	0	0	0					0	@	P		p
0	0	0	1	1				!	1	A	Q	a	q
0	0	1	0	2				"	2	B	R	b	r
0	0	1	1	3					3	C	S	c	s
0	1	0	0	4					4	D	T	d	t
0	1	0	1	5				%	5	E	U	e	u
0	1	1	0	6				&	6	F	V	f	v
0	1	1	1	7				'	7	G	W	g	w
1	0	0	0	8				(	8	H	X	h	x
1	0	0	1	9				)	9	I	Y	i	y
1	0	1	0	10				*	:	J	Z	j	z
1	0	1	1	11				+	;	K		k	
1	1	0	0	12				,	<	L		l	l
1	1	0	1	13				-	=	M		m	
1	1	1	0	14				.	>	N		n	
1	1	1	1	15				/	?	O	⓪	o	

CCITT-44100

- ① Position 5/15 can be displayed as "low line", —, or as "number sign" #, to represent the terminator function required for some existing Videotex services.

FIGURE 3/T.100

The primary set of graphic characters for international interactive Videotex

					b ₇	0	0	0	0	1	1	1	1
					b ₆	0	0	1	1	0	0	1	1
					b ₅	0	1	0	1	0	1	0	1
						0	1	2	3	4	5	6	7
b ₄	b ₃	b ₂	b ₁		0				°		-	Ω	κ
0	0	0	0	0	1			i	±	`		Æ	æ
0	0	1	0	2				¢	2	'		Ð	đ
0	0	1	1	3				£	3	^		ä	ö
0	1	0	0	4				\$	x	~		Ĥ	ĥ
0	1	0	1	5				¥	μ	-			ı
0	1	1	0	6				#	¶	˘		IJ	ij
0	1	1	1	7				§	•	•		Ł	ł
1	0	0	0	8				¤	÷	¨		Ł	ł
1	0	0	1	9				‘	’			Ø	ø
1	0	1	0	10				“	”	°		Œ	œ
1	0	1	1	11				<<	>>	˘		◊	β
1	1	0	0	12				←	¼			þ	þ
1	1	0	1	13				↑	½	"		ƒ	£
1	1	1	0	14				→	¾	˘		ŋ	ŋ
1	1	1	1	15				↓	¿	˘		’n	

CCITT-44111

FIGURE 4/T.100

The supplementary set of graphic characters for international interactive Videotex

5.1.2 Two modes have been identified, which are known as *serial* and *parallel* modes respectively. The two modes are distinguished by their display control sets which are coded in C1 sets, designated and represented by ESC F_e sequences as described in § 2.2.1.

5.1.3 The two modes have common features and specific features described in §§ 5.2 to 5.4 below.

5.2 Common control functions

5.2.1 General functions

The *active position home (APH)*

This function causes the active position to be moved to the first position of the first row. Its coded representation is 1/14 in Figure 2/T.100.

5.2.2 Device control functions

The following device control functions have been defined.

5.2.2.1 Definitions

cursor on (CON)

F: curseur en marche (CON)

S: cursor activo (CON)

The cursor on (CON) causes the active position to be visualized as a marker.

cursor off (COF)

F: curseur arrêté (COF)

S: cursor inactivo (COF)

The cursor off (COF) causes the active position to be displayed in the same way as other character positions.

device stop (DSP)

F: arrêt dispositif (DSP)

S: detención de dispositivo (DSP)

The device stop (DSP) causes a designated terminal device to stop.

device start (DST)

F: mise en marche dispositif (DST)

S: arranque de dispositivo (DST)

The device start (DST) causes a designated terminal device to start.

device wait (DW)

F: dispositif en attente (DW)

S: espera de dispositivo (DW)

The device wait (DW) causes a designated terminal device to pause.

5.2.2.2 Coding

CON is coded 1/1, COF is coded 1/4 in the C0 set. DSP, DST and DW functions are coded as 3-character sequences of the Form ESC 3/x (P), where x = 7, 6 and 5 respectively, and P is a parameter that designates a particular device.

5.3 Serial mode

5.3.1 General

5.3.1.1 The serial mode is based on the assumption that changes in character attributes normally occur in interword spacings. This results in control characters being serially stored in the page memory and normally results in their display on the screen as a rectangle in the prevailing background colour.

5.3.1.2 The C1 set for the serial mode is given in Figure 5/T.100. Display controls of the serial set causes the active position to be moved one character position forward. In that case, the position thus vacated is to be generally displayed as a space. The display control *hold mosaics* ESC 5/14 may modify this situation.

5.3.2 Display control functions

5.3.2.1 The (F_e) codes are listed as follows:

5.3.2.2 Alpha red	}	Controls functions that cause the currently designated and invoked alphanumeric set to be displayed in the indicated colour until the occurrence of an explicit colour control or the end of a row.
Alpha green		
Alpha yellow		
Alpha blue		
Alpha magenta		
Alpha cyan		
Alpha white		

5.3.2.3 Flashing

A control function that causes the characters following it in the same row to be displayed alternately as they would normally be displayed, and as spaces, in the prevailing background colour, under the control of a timing device in the receiver

5.3.2.4 Steady

A control function that causes the action of *flashing* to be stopped.

5.3.2.5 Start box

Reserved for starting the action of defining a picture area in a page of text. (For further study.)

5.3.2.6 End box

Reserved for terminating the action of boxing. (For further study.)

5.3.2.7 Normal height

A control function that causes the graphic characters following it to occupy one character position each.

5.3.2.8 Double height

A control function that causes the characters following it to occupy each its active positive and the corresponding position on the following row.

5.3.2.9 Mosaics red

Mosaics green

Mosaics yellow

Mosaics blue

Mosaics magenta

Mosaics cyan

Mosaics white

Control functions that cause the mosaic graphic set to be displayed in the indicated colour until the occurrence of an explicit colour or the end of the row. Unallocated code table positions (4/0-5/15) cause the characters of the currently designated and invoked alphanumeric set to be displayed. This is defined as *blast – through* operation.

Copyright International Telecommunication Union/ITU Telecommunication Sector