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Terminalska oprema (TE) – Videotex – Fotografska skladnja

Terminal Equipment (TE); Videotex; Photographic Syntax

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Foreword

This second edition European Telecommunication Standard (ETS) has been prepared by the Terminal Equipment (TE) Technical Committee of the European Telecommunications Standards Institute (ETSI) in order to specify a new common data syntax for transmitting photographic images to be used by Videotex terminal equipment. It is now submitted under the Unified Approval Procedure (UAP) of the ETSI standards approval procedure.

This ETS is part of a series of ETSs which describe the Videotex presentation layer data syntax.

This ETS defines a data syntax to be used for conveying photographic data in a Videotex environment. The necessary tools are provided for the transfer of photographic data, typically from a Videotex Host to a Videotex terminal. This data syntax is equally applicable to either storage or communication applications and is independent of physical device or transmission media.

This ETS does not deal with the visible appearance of the displayed pictures, however all the necessary source image information is provided to make the proper physical adaptation at the receiving side. The specification of post-processing techniques is left to the implementors and is, therefore, outside the scope of this ETS.

More precisely, this ETS defines the syntax and semantics of image data and image attributes for photographic Videotex interchange purposes. In particular, it addresses the various aspects of image dimensionality such as spatial, amplitude, temporal and spectral content, it provides some basic tools for positioning photographic images within a defined area, it also addresses the structure and organisation of the data and uses standardized compression schemes. In particular, the ISO-Joint Photographic Experts Group (JPEG) compression algorithm (see ISO/IEC 10918-1 [13]), based on the Discrete Cosine Transform (DCT), the facsimile ITU-T Recommendation T.4 [17] and CCITT Recommendation T.6 [18] coding algorithms are used. In this ETS the algorithms or compression techniques themselves are not described, references are provided.

The intention of this ETS is primarily to provide Videotex application developers with a sufficient set of photographic transfer tools which are independent of the equipment used to implement/provide them. This ETS is intended to support operations on and display of various classes of images from a wide variety of imaging applications. However, to ensure that compatibility can be achieved between various Videotex services supporting photographic mode, some realistic and specific characteristics are chosen and defined in the clause on profiles (clause 11). In the future, other selections might be made allowing the definition of new recommended profiles.

This ETS closely follows the concepts and coding techniques as described in ISO/IEC 9281-1 [11] for the identification of pictorial information and for switching between picture environments and coding systems according to ISO 2022 [10].

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	30 April 1995
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1 Scope

This ETS specifies the data syntax to be used by Videotex services for conveying photographic data.

In general, it applies to the interchange of photographic data via storage or transmission media.

This ETS is applicable to Videotex terminals connected to various types of telecommunication networks including; a Public Switched Telephone Network (PSTN), a Packet Switched Public Data Network (PSPDN) or an Integrated Services Digital Network (ISDN). For the ISDN case, these terminals will typically support "ISDN Syntax-based Videotex" (see ETS 300 079 [3]).

The syntax allows for some private extensions beyond the transmission of still pictures. For example, a provision has been made for the transmission of a "difference" image to allow a slow scan television type of application.

2 Normative references

This ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references subsequent amendments to or revisions of, any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 072: "Terminal Equipment (TE); Videotex presentation layer protocol, Videotex presentation layer data syntax".
- [2] ETS 300 076: "Terminal Equipment (TE); Videotex, Terminal Facility Identifier (TFI)".
- [3] ETS 300 079 (1991): "Integrated Services Digital Network (ISDN); Syntax-based Videotex, End-to-end protocols".
- [4] CCITT Recommendation F.300 (1988): "Videotex service".
- [5] ITU-T Recommendation T.101: "International interworking for videotex services".
- [6] CCITT Recommendation H.261 (1988): "Common intermediate format".
- [7] CCITT Recommendation T.51: "Latin based coded character sets for telematic services".
- [8] CCITT Recommendation T.61 (1988): "Character repertoire and coded character sets for the international teletex service".
- [9] CCIR Recommendation 601-1 (1986): "Encoding Parameters of Digital Television For Studios".
- [10] ISO 2022 (1986): "Information Processing - ISO 7-bit and 8-bit coded character sets - Code extension techniques".
- [11] ISO/IEC 9281-1 (1990): "Information technology - Picture coding methods- Part 1: Identification".
- [12] ISO/IEC 9281-2 (1990): "Information Technology - Picture coding methods - Part 2: Procedure for registration".
- [13] ISO/IEC 10918-1/ITU-T Recommendation T.81: "Information technology - Digital compression and encoding of continuous-tone still images - Requirements and guidelines".

- [14] ISO 646 (1990): "Information processing - ISO 7-bit coded character set for information interchange".
- [15] ISO 6937 (1991): "Information processing - coded character sets for text communication".
- [16] ISO 2375 (1991): "Data Processing - Procedure for registration of escape sequences".
- [17] ITU-T Recommendation T.4 (1993): "Standardization of group 3 facsimile apparatus for document transmission".
- [18] CCITT Recommendation T.6 (1988): "Facsimile coding schemes and coding control functions for group 4 facsimile apparatus".
- [19] ITU-T Recommendation T.82 (1993): "Information technology - Coded representation of picture and audio information - Progressive bi-level image compression".
- [20] ITU-T Recommendation T.30 (1993): "Procedures for document facsimile transmission in the general switched telephone network".
- [21] ITU-T Recommendation T.563 (1993): "Terminal characteristics for group 4 facsimile apparatus".

3 Definitions, symbols and abbreviations

3.1 Definitions

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For the purposes of this ETS the following definitions apply.

aspect ratio: The ratio of the width to the height of a rectangular area, such as the defined display area.

attribute: A particular property or quantity defined in this syntax and described by a number of parameters (e.g. the source picture specifications).

baseline: The basic sequential DCT-based encoding and decoding process specified in ISO/IEC 10918-1 [13].

continuous tone image: An image comprised of data which exhibits a first order continuity in the analogue domain and requires, when digitized, more than one bit to describe each sample contained in one or more of its components (monochrome (grey scale) or colour pictures) e.g., a monochrome image needs at least 6 bits/picture element (64 grey levels) to appear "continuous" to the eye.

Data Syntax I: Term used within ITU-T for one of the recommended world-wide Videotex data syntaxes originating from the Japanese Character And Pattern Telephone Access Information Network (CAPTAIN) system.

Data Syntax II: Term used within ITU-T for one of the recommended world-wide Videotex data syntaxes originating from the European CEPT Videotex syntax.

Data Syntax III: Term used within ITU-T for one of the recommended world-wide Videotex data syntaxes originating from the North American Presentation Layer Protocol Syntax (NAPLPS).

Defined Display Area (DDA), Physical (Physical Defined Display Area (DDA)): A rectangular area of the full screen area where photographic data, text etc. shall be displayed.

Defined Display Area (DDA), Logical (Logical DDA): A unit square, the length of all sides being one unit, co-ordinates being defined as fractions of unity (unit screen concept). The origin is coincident with the bottom left corner of the physical DDA and one side is coincident with the longest side of the physical DDA.

Defined Display Area, Source (Source DDA): The virtual display space where the source image was encoded and which is to be mapped for display either to the full screen area or to the physical DDA.

Discrete Cosine Transformation (DCT): Either the forward discrete cosine transform or the inverse discrete cosine transform [ISO/IEC 10918-1].

facsimile picture: A photographic picture, encoded with ITU-T Recommendation T.4 [17] or CCITT Recommendation T.6 [18] facsimile coding, using the present Videotex Photographic Syntax.

full screen area: The part of a display screen where photographic data can be displayed, it normally means a display with no borders.

forward DCT: A mathematical transformation using cosine basis functions which converts a block of samples into a corresponding block of original DCT co-efficients [ISO/IEC 10918-1].

inverse DCT: A mathematical transformation using cosine basis functions which converts a block of dequantized DCT coefficients into a corresponding block of samples [ISO/IEC 10918-1].

image attribute: The various properties of a continuous tone image described by a number of parameters.

image data: The data which represents a continuous tone image in digital form, it contains photographic header data and photographic data.

JPEG compression algorithm: A general term for referring to any one of the possible modes of encoding defined in ISO/IEC 10918-1 [13].

normalised co-ordinate: A co-ordinate specified in a device independent co-ordinate system, normalised to some range (usually to 1).

page: See Defined Display Area, Source (Source DDA). If digitized with a facsimile scanner a page is generally equivalent to the whole facsimile content of an ISO paper sheet format (ISO A4, B4, A3...).

parameter: A quantity which is described using one or more sub-parameters.

photographic data: Pixel based pictorial information usually in compressed digital form; the data includes any tables which are necessary to decode and decompress the data.

photographic data syntax: The rules by which the photographic header data and the photographic data are formatted.

photographic header data: Coded data containing the values of the attributes and parameters used for describing the photographic image.

photographic image: A continuous tone image, e.g. an image represented with 256 shades of grey.

photographic mode: The mode of operation of a Videotex terminal while it is receiving photographic header data and photographic data.

photographic profile: A collection of attributes with parameters set to a given value to represent a type of source image and define a mode of photographic image coding and photographic image transfer.

photo Videotex: Neologism used for Videotex photographic mode.

physical device: Any tangible piece of equipment (e.g., personal computer, display monitor, etc.).

pixel, picture element: It is the minimum displayable element of an image (see ISO/IEC 10918-1 [13]).

pixel density: Expresses the number of pixels per physical unit (e.g. pixels/mm) in the horizontal and vertical directions.