

Teleweb application —

Part 3: Superteletext profile

The European Standard EN 62298-3:2005 has the status of a British Standard

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National foreword

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CENELEC

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Foreword

The text of document 100/924/FDIS, future edition 1 of IEC 62298-3, prepared by IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62298-3 on 2005-06-01.

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The text of the International Standard IEC 62298-3:2005 was approved by CENELEC as a European Standard without any modification.

CONTENTS

INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms, definitions and abbreviations	7
3.1 Terms and definitions	7
3.2 Abbreviations	7
4 Display	8
4.1 Colour representation	8
4.2 Text representation	9
4.3 Text placement.....	11
4.4 Image representation	12
4.5 4:3 and 16:9 aspect ratio displays	12
5 URLs	13
5.1 File naming	14
5.2 Access through page number	14
5.3 TeleWeb file reference scheme	15
5.4 Teletext page reference scheme.....	17
5.5 NexTView reference scheme	18
5.6 Special function URLs	19
6 Text and hypertext.....	19
6.1 TeleWeb HTML file format.....	19
6.2 Syntax of TeleWeb HTML tags	21
6.3 Document structure elements	23
6.4 Header section tags	26
6.5 Paragraph formatting.....	28
6.6 Character formatting.....	31
6.7 Hypertext links	35
6.8 Lists	40
6.9 Tables	43
6.10 Images	49
6.11 Ticker text	52
6.12 Exceptional ignored tags	54
7 TeleWeb default style	54
8 Image files.....	54
8.1 GIF	54
8.2 JPEG	55
9 Content labelling	55
9.1 Predefined themes and identifier coding	55
9.2 Parental ratings	55
10 Special data	55
10.1 Service identification graphic.....	55
10.2 Home page.....	56
10.3 Default page.....	56

10.4 Profile upgrade page	56
10.5 ZLIB dictionary files	56
11 Service-related attributes	57
11.1 Name	57
11.2 Information	57
11.3 Language	57
11.4 Transmission schedule	57
12 File-related attributes	58
12.1 General file attributes	59
12.2 File content attributes	60
12.3 Time- and date-related attributes	61
12.4 Storage-related attributes	62
12.5 Special function attributes	62
13 Short and full TeleWeb service	63
14 Individual addressing – Group addressing	64
Annex A (informative) HTML compatibility	65
Annex B (normative) Default colour palette specification	68
Annex C (normative) Table of predefined themes	70
Annex D (informative) TeleWeb document type definition (DTD)	77
Annex E (informative) TeleWeb default CSS2 style sheet	86
Annex F (normative) Font metrics	89
Annex G (informative) TeleWeb Superteletext profile reference decoder	94
Bibliography	97
Annex ZA (normative) Normative references to international publications with their corresponding European publications	98
Table 1 – Default colour palette	9
Table 2 – Font sizes	10
Table 3 – File naming	14
Table 4 – EPG parameters	16
Table 5 – Profile parameter	17
Table 6 – Special function URLs	19
Table 7 – List of service-related attributes	57
Table 8 – List of file-related attributes	58
Table 9 – Rating scheme	61
Table 10 – Filter attributes for nexTVView references	64
Table A.1 – HTML V3.2 tags not supported	65
Table A.2 – HTML V3.2 attributes not supported	66
Table A.3 – Browser specific tags supported	66
Table A.4 – TeleWeb specific tags supported	66
Table B.1 – Default colour palette specification	68
Table C.1 – Predefined themes	70

INTRODUCTION

The aim of TeleWeb is to deliver World Wide Web-style content to the living-room TV to give the viewer an enhanced television experience. A TeleWeb service broadcasts data files containing text and high-definition graphics to suitable decoders. The data transmitted can be closely linked to events within the accompanying TV programs or can be more general in nature to emulate a traditional, but higher definition, superteletext service. Different profiles are defined.

It is intended that TV-based decoders can be implemented in a cost-effective manner without recourse to the technology normally associated with personal computers. In part, this is achieved by limiting the number of different types of multimedia data that can be used within a service. By careful design of the user interface, decoder manufacturers will be able to offer easy-to-use equipment for accessing TeleWeb services without requiring the consumer to be computer-literate. In addition, they will be able to customize their products to differentiate them from those of their competitors.

This standard specifies the TeleWeb Superteletext profile and focuses on the presentation layer especially the implementation of TeleWeb HTML. It further defines graphical requirements like colours and fonts and the content formats used.

TELEWEB APPLICATION –

Part 3: Superteletext profile

1 Scope

This part of IEC 62298 specifies the TeleWeb Superteletext profile that allows Web-style text and graphics to be displayed on suitable decoders. A TeleWeb service comprises multimedia data files whose format and attributes are defined by this specification. This specification focuses on the presentation layer especially the implementation of TeleWeb HTML. It further defines graphical requirements like colours and fonts and the used content formats. For information regarding general information and the transport layer, refer to IEC 62298-1 and IEC 62298-2.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62297-1, *Triggering messages for broadcast applications*

ISO 639-2, *Codes for the representation of names and languages – Part 2: Alpha-3 code*

ISO 8601, *Data elements and interchange formats – Information interchange – Representation of dates and times*

ISO 8859-1:1998, *Information technology – 8-bit single-byte coded graphic character sets – Part 1: Latin alphabet No. 1*

ETSI TR 101 231, *Television systems; Register of Country and Network Identification (CNI), Video Programming System (VPS) codes and Application codes for Teletext based systems*

ETSI EN 300 231, *Television systems; Specification of the domestic video Program Delivery Control (PDC) system*

ETSI EN 300 468, *Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems*

ETSI EN 300 706, *Enhanced Teletext Specification*

ETSI EN 300 707, *Electronic Program Guide (EPG); Protocol for a TV Guide using electronic data transmission*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1 **button**

part of the user interface that enables the viewer to select a page or trigger an event, etc. It may not necessarily exist as a physical button on a remote control handset

3.1.2 **CDATA**

character data in an HTML document. Character entities and HTML mark-up is not recognized

3.1.3 **conditional access (CA)**

mechanism by which user access to service components can be restricted

3.1.4 **PCDATA**

Parsed character data in an HTML document. Character entities (numeric and named entities) as well as HTML mark-up are recognized in the data

3.1.5 **signed_integer**

positive or negative integer value, in decimal notation. The first digit is preceded by a mandatory plus (+) or minus (–) symbol with no white space between the symbol and the first digit

3.1.6 **text_string**

sequence of displayable Latin-1 characters

3.1.7 **unsigned_integer**

integer value, in decimal notation, without a preceding plus (+) or minus (–) symbol

3.2 Abbreviations

ASCII	American Standard Code for Information Interchange
CA	Conditional Access
CDATA	Character Data
CRC	Cyclic Redundancy Check
DTD	Document Type Definition
DVB	Digital Video Broadcasting
ETS	European Telecommunication Standard
GIF	Graphics Interchange Format
HTML	Hyper Text Mark-up Language
JFIF	JPEG File Interchange Format
JPEG	Joint Picture Experts Group
LSB	Least Significant Bit

MJD	Modified Julian Date
MSB	Most Significant Bit
PCDATA	Parsed Character Data between tags
RFC	Request For Comments
URL	Uniform Resource Locator
UTC	Universal Time Coordinated
WWW	World Wide Web

4 Display

This clause defines the minimum requirements of a TeleWeb display. They are applicable to both editing stations and decoders.

4.1 Colour representation

4.1.1 General requirements

A decoder shall be able to display each pixel on the text/graphics, background image and background colour planes in a different colour from a palette of at least 188 colours. Full transparency and one-level semi-transparency to video shall also be supported.

A decoder may be implemented with either a true-colour store or an indexed colour system. To accommodate the latter type of decoder and to define a palette for GIF images that do not specify a palette themselves, a single 188 colour palette is defined in 4.1.5. As a minimum, the text/graphics, background image and background colour planes shall be able to support colours subjectively equivalent to these colours. Content can be authored using other colours, but authors should be aware that some decoders may not be able to reproduce them exactly and may map such a colour to the closest match in the pre-defined colour palette.

For authoring purposes the text/graphics, background image and background colour planes shall support at least 188 colours on the screen at any one time. In practical terms, a decoder is likely to be able to display at least 256 colours, giving the equipment manufacturers at least 68 colours for their user interface.

To get an optimal display, the content should be authored using the TeleWeb default colour palette. The response of a decoder is not defined by this specification if the colours used are not all taken from the pre-defined colour palette. Under these circumstances, colour dithering or matching techniques may need to be applied and the response of decoders may differ.

4.1.2 Colour resolution

Each colour shall be defined by red, green and blue (RGB) components or by a colour constant (see 6.2.5.1).

The authored content shall define colours as 24-bit values, i.e. 8 bits for each component in the order R, G, B.

A decoder is required to have a colour resolution of at least 4 bits per component (12 bits minimum overall).

4.1.3 Gamma

Decoders shall assume that all RGB values defined and invoked by authored content have been gamma pre-corrected for the eye.

4.1.4 Transparency

Decoders are required to implement a minimum of three levels of transparency – opaque, semi-transparency and completely transparent.

The colour palette is optimized for 30 % semi-transparency. Where the decoder cannot implement the value of 30 % semi-transparency, it shall replace it with the nearest value of semi-transparency it can implement. If the encoded value of transparency is in the range between 10 % and 90 %, it shall not be approximated as either 0 % or 100 % transparency. So, 9 % may be approximated as 0 % but 10 % shall be represented with a value in the range 10 % to 90 % such as 30 %. Similarly, 91 % may be approximated as 100 %.

4.1.5 Colour palette

The predefined set of 188 colours is shown in Table 1 and in Annex B. The colours chosen have a perceptually uniform distribution over the colour space. A service provider may choose to author content using only this set of colours.

As a minimum, a decoder shall support these colours up to its resolution limit. It is then the responsibility of the decoder to map the colours defined within the authored content to their closest approximation within the predefined set.

Table 1 – Default colour palette

Transparency level	Total number of entries	Quantization levels for red	Quantization levels for green	Quantization levels for blue
0 % (fully opaque)	135	5 levels: 0, 63, 127, 191, 255	9 levels: 0, 31, 63, 95, 127, 159, 191, 223, 255	3 levels: 0, 127, 255
0 % (fully opaque)	4	4 additional grey-scale colours: R = G = B = 42, 85, 170, 212		
30 %	48	4 levels: 0, 85, 170, 255	6 levels: 0, 51, 102, 153, 204, 255	2 levels: 0, 255
100 % (fully transparent)	1	-	-	-
Decoder definable	68			
NOTE Levels are quoted as decimal values in the range 0 to 255.				

To allow these colours to be used to render a GIF image from which the colour palette information has been omitted, it is necessary to assign a unique value to each colour, as defined in Annex B.

4.2 Text representation

Text is rendered using one proportionally spaced font and one monospaced font, each in five sizes and in two styles – plain and bold. Italics and bold italics styles are optional. The fonts are not defined by this specification. Instead, the metrics of each character cell are defined for all aforementioned sizes to ensure compatibility between equipment.

A service provider who wishes to ensure consistent displays shall author content using the same metrics as implemented in decoders. Content shall be authored with kerning disabled.

4.2.1 Required sizes

Table 2 shows the supported font sizes for the proportional and monospaced font and the assignment to the size attribute of the HTML font tag. The font and character metrics including the width (advance) of all character cells for the proportional and the monospaced font for the different font sizes are specified in Annex F.

Table 2 – Font sizes

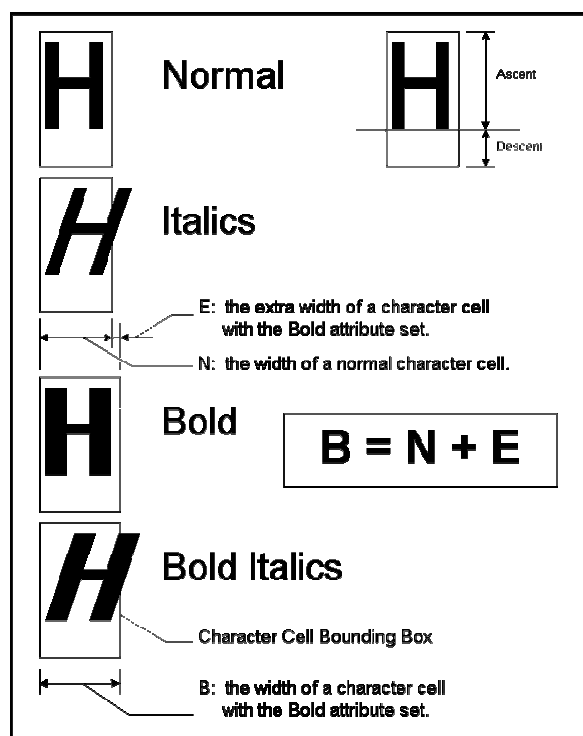
Size pixels	HTML Font tag
22	SIZE = 1 or 2
24	SIZE = 3
27	SIZE = 4
31	SIZE = 5
36	SIZE = 6 or 7

4.2.2 Bold and italic styles

If the font does not support the bold style, a bold version can be emulated by writing a second instance of the required character with an offset by one pixel to the right of the normal position. The bold style should be restricted to small parts of the text, for example, headings. It should not be used for the whole text. The emulated bold style may not be acceptable for certain characters especially for the small font sizes (for example, the double-quote character or the characters with umlaut may be critical). In this case, the bold style should be avoided for these characters.

For the proportional font, the width (advance) of a character cell containing a bold character may be increased by a maximum of one pixel per character, as shown in Figure 1. Content shall be authored with this extra pixel space in mind. For the monospaced font, the width of all characters of a given font size is the same for all styles.

The implementation of the optional italic and bold italic style is left open. However, the corresponding character cell width shall always be the same as for the plain and bold styles respectively.



IEC 686/05

Figure 1 – Character metrics

4.2.3 Character repertoire

Decoders shall support the full ISO Latin-1 character set given in ISO 8859-1 and the EURO sign character (Unicode 0x20AC). The EURO sign can be used by the name character entity (&euro) or the numerical representations (#&X20AC or #&8364). If the character encoding of the HTML file is different from ISO Latin-1 or the character is not defined in ISO Latin-1 and is not the EURO sign the decoder shall display a replacement character represented by an empty square with the size of a capital 'V'.

NOTE The characters 0x00 to 0x1F and 0x7F to 0x9F are not defined by ISO Latin-1; thus, a replacement character will be shown instead.

4.2.4 Default attributes

In the absence of any font, size, foreground colour or background information within the authored content, a decoder is free to set its own default conditions. It is recommended that the decoder follow the default style defined in Annex E.

4.3 Text placement

4.3.1 Text width

To ensure that text will flow identically on different decoders and authoring equipment, regardless of the quality of the character rendering, simple algorithms are defined to determine vertical placement and when to wrap lines of text. The flow is considered identical if lines and words break at the same character position. The calculations allow content creators to provide sufficient space for their strings at authoring time. They make no demands on the particular rendering system employed. The characters can be bit-map or vector fonts, aliased or anti-aliased, etc. The calculations shall be applied in both authoring equipment and decoders.

4.3.2 Text-width calculation

The width calculation is defined in terms of the bounding rectangle of each character as defined within the font metrics shown in Figure 1. Any extra width due to bolding shall be taken into account for the proportional font. The width of a text string is the sum of the character widths. This calculation is carried out at pixel-resolution.

4.3.3 Line breaks

Once the text-width calculation defined in 4.3.1 produces a result that exceeds the space available, the first word after a white space (but not a non-breaking space (0xA0)), a hyphen (0x2D) or a soft hyphen (0xAD) that will not fit completely on the line shall be rendered on the line below. This implies the equipment does not have to know or apply word-hyphenation rules.

4.3.4 Vertical line spacing

The baseline of a font is determined by its ascent and descent metrics (see Figure 1). All characters are vertically aligned to their baseline. The vertical space required for a line is the sum of the largest ascent and the largest descent in that line plus the gap (external leading). The gap (external leading) between lines is set to –1 for all fonts and all sizes.

4.4 Image representation

4.4.1 Format

A decoder is required to implement the full GIF specification [GIF], apart from the "plain-text" extension. A transmitted file may include "plain text". In addition, the sequential baseline JPEG image format is supported [HTML3.2][HTML4.0][XHTML1.0].

4.4.2 Animation

Animation and looping of GIF images are supported as described in [GIF] and [GIFabout] respectively.

NOTE There is no minimum time specified for the display of one frame when animating or looping. This will depend upon the processing power in the decoder and the complexity and size of the images. Different decoders may show different response speeds. The size of an animated GIF image may be restricted by a code of practice.

4.4.3 Use on the background image plane

An image that is smaller than the background image plane should be tiled to fill the available area.

A decoder is not required to reproduce animation on the background image plane. If multiple frames are present in the designated file, the first frame should be displayed continuously.

4.5 4:3 and 16:9 aspect ratio displays

Content should be authored for a 4:3 display. Decoders with a screen aspect ratio of 16:9 can choose to render the TeleWeb content so that its 4:3 aspect ratio is maintained. Thus, a circle in an image should still appear as a circle.

The aspect ratio used to display the TeleWeb content is the responsibility of the decoder manufacturers. The TeleWeb specification recommends the display of the content square pixel in 4 by 3 but leaves other options open to the manufacturer. Displaying the content using a 16:9 aspect ratio seems to be acceptable (IFA 2001).

The above is valid as long as there is no transparency to the video. In the latter case, the content should be displayed in the aspect ratio of the displayed video to guarantee alignment with the video. Displaying 4 by 3 TeleWeb content on top of 16:9 video can give nasty side-effects (see Figure 2) . The broadcaster, aware of this set behaviour, can pre-compensate the drawings and pictures on such transparent content in line with the broadcast video (for example, broadcast an oval to have a circle displayed).

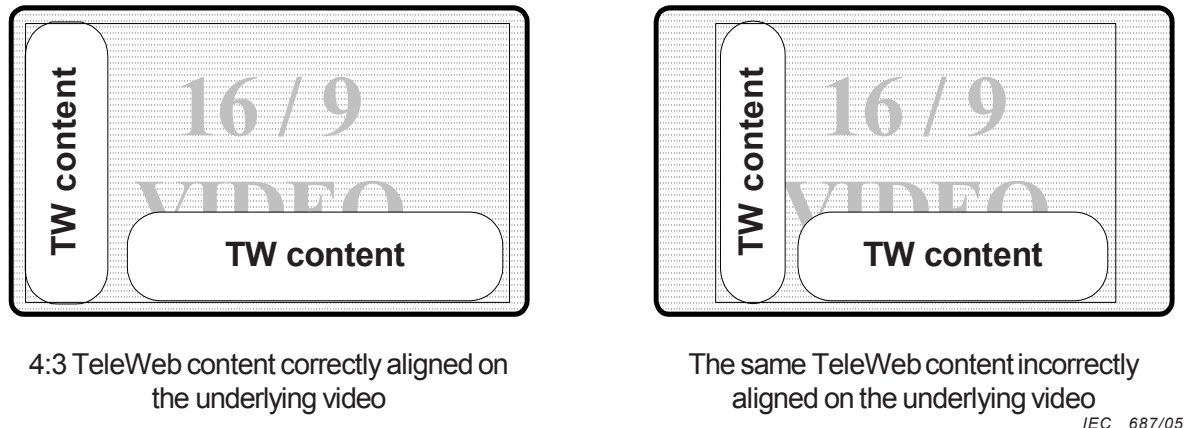


Figure 2 – Alignment of transparent content over video

5 URLs

A uniform resource locator (URL) is a compact textual notation for accessing information within the TeleWeb system. The URLs within the TeleWeb system shall conform, except where otherwise noted, to the syntax for Internet URLs as specified in [URI]. Note that the URL character set is limited to the lower half of the ISO-Latin-1 character set as described in ISO 8859-1. To ensure compatibility with other browsers, URLs shall encode character codes in the upper half.

A URL consists of a scheme and a scheme specific part. All characters in a URL belong to the ISO Latin 1 character set as described in ISO 8859-1.

scheme : scheme-specific-part

In a complete URL, the scheme is followed by a colon (':') and the string for the scheme specific part. Superteletext profile decoders shall ignore schemes not listed in this clause when such schemes appear in TeleWeb documents.

The scheme name is a string of characters. The only characters permitted in a scheme name are the lower-case characters 'a' through 'z', the digits '0' through '9', and the characters plus, hyphen, and full-stop, i.e. '+', '-', '.'. For robustness, software that interprets URLs (for example, the TeleWeb decoder) shall map upper-case alphabetic characters to their corresponding lower-case characters.

The scheme-specific-part is a string of safe characters. Safe characters have a printable graphic representation in ISO Latin-1 as described in ISO 8859-1. Furthermore, the set of safe characters is restricted to respect the reserved use of some punctuation characters.

The alphabetic characters are at positions 41 hex through 5A hex, 61 hex through 7A hex, C0 hex through D6 hex, D8 hex through F6 hex, and F8 through FF hex. Thus, only alphanumeric characters, characters in the string "\$_+!*()," and scheme-specific key characters from the string ";/?:@=&" may be used un-encoded within a URL. Any data character, on the other hand, may be encoded. Encoded characters shall be recognized and decoded by software that interprets URLs. A data character is one not used as punctuation by a scheme.

Data character encoding is the mapping of an 8-bit value to a 3-character sequence. The per cent character, '%', indicates the start of the code. The next two characters are the hexadecimal value of the encoded character. For example, a space is encoded as %20 since a space has the code 32 decimal, which is 20 hexadecimal. A per cent data character is encoded as %25 since the per cent sign is at position 37 decimal (or 25 hex). An incomplete encoding sequence, for example, %F=, has no specified meaning.

5.1 File naming

A name attribute (12.1.2) shall be associated with each file. This attribute, a text string, shall include both name and type (extension) elements, for example, "file1.html", where "file1" is the name element and "html" is the type element. This name should be used to reference the corresponding file in any hypertext links. The file type element for HTML (text) files shall be either "htm" or "html". Table 3 specifies naming conventions for the file types processed by TeleWeb.

Table 3 – File naming

Content type	File-name extension	MIME type
HTML	.htm or .html	text/html
GIF	.gif	image/gif
JPEG	.jpg or .jpeg	image/jpeg
ZLIB Dictionary	.dic	application/x-zlib-dic

A type attribute (see 12.1.1) shall be included with the file and shall indicate the type of the file, for example, for HTML "text/html". If a type attribute is omitted or missing, a decoder should attempt to determine the file type by inspecting the name attribute. In the event of a conflict, the type attribute shall have priority. File names are not case-sensitive.

5.2 Access through page number

This subclause describes how pages can be accessed directly through page numbers.

The body of such file names is composed of digits only, for example, 123.htm, 4545.html, 911.htm and 4444.html.

A set maker shall provide a mechanism to select these files directly through digit entries. For example, a file with the name '123.html' can be reached directly by typing in the digits '1', '2' and '3' on the remote control. The definition of the user interface is up to the set manufacturers. They can provide numerical access through a special button, a menu item or any other technique in line with their user interface.

The numerically named files shall be broadcast in the root directory of the TeleWeb content. Numeric file names in subdirectories will not be accessible through this digit entry user interfaces.

All numbers within one TeleWeb transmission shall fulfil the prefix condition, which defines that a number should never be the prefix of another number. For example, 1234.html may not exist in the same TeleWeb service as 1234567.html.

The length of the digit sequence is limited only by the maximum length of the file name.

5.3 TeleWeb file reference scheme

TeleWeb file reference URLs may be absolute or relative. An absolute URL specifies the service name of the content provider, while a relative URL cannot. An absolute URL shall specify a complete path to a resource, while a relative URL can specify a partial path.

5.3.1 Absolute URLs

An absolute TeleWeb URL has the form

tw : // service-name / path-name [?query] [# fragment]

where all upper-case characters are considered equivalent to their lower-case forms and where portions within brackets may be omitted.

The components are specified below:

tw is the scheme name, which identifies the scheme-specific part as a TeleWeb URL.

// service-name identifies the name of the service (see 11.1).

/ path-name The path to the information, i.e. loosely the name of the file. Slashes within the path-name identify hierarchical sections of the name, but do not require a specific data structure within TeleWeb components, though an analogy to a file system is possible. The slash ('/') is thus a reserved character, and a data slash shall be encoded as %2F if needed. Furthermore, the hierarchical section names . and .. ("dot" and "dot-dot") are reserved, and data with these names may be specified with %2E and %2E %2E if needed. The dot-separator preceding the file type element is clearly data, since it is not itself a hierarchical element. Therefore, a dot-separator does not have to be encoded, though it may, since it is considered data when specifying a URL.

Once the hierarchical sections have been identified, all . sections are discarded, then all section-.. section pairs are discarded. Finally, all remaining sections are recombined, separated by slashes to give the resource name (file name). See also 5.3.4.

fragment The fragment indicates the anchor within the accessed document to be focused when displaying the linked document. The anchor in the linked document is defined by the corresponding name (for <A> elements) or id attribute (for image maps). The indicated anchor shall be appropriately highlighted.

If the fragment is empty or invalid (not present in the target document, for example), the first available anchor in the upper left corner shall be highlighted.

?query The query defines additional parameters for the URL (see 5.3.3).

5.3.2 Relative URLs

A relative TeleWeb file reference URL has the form

[/] path-name [?query] [# fragment]

where the meaning of the components is as was specified in the subclause on absolute URLs (see 5.3.1).

If the relative URL begins with a slash, then the path name is taken as absolute within the service used in the context where the link is found. If the relative URL does not begin with a slash then the service and the path is inherited from the link's context. If it is not empty, the URL's path name then replaces the last hierarchical section in the inherited path name. The resulting path name is evaluated as in the subclause on absolute URLs.

Anchor names and query parts are never inherited.

5.3.3 URL query

The query part of a TeleWeb URL specifies additional parameters for the URL. Parameters are either keywords or keyword value pairs. Parameters are separated by semicolons. Keywords are separated from values by equality signs. Thus ';' and '=' are reserved in the query part. The order and presence of keyword value pairs is arbitrary. The keyword value pairs that shall be recognized are defined in the following subclauses. Any two parameters in a query shall have different types.

5.3.3.1 The EPG parameters

These parameters, shown in Table 4, can be used to realize a TeleWeb EPG.

Table 4 – EPG parameters

Parameter	Syntax	Format	Example
Network operator	<i>cni=CNI_code</i>	4-digit hexadecimal value. The country and network identification (CNI) code for the broadcaster of the enclosed program. If a three-character VPS code has to be used, it shall be preceded with 0	<i>cni=C380</i>
PIL	<i>pil=PIL_code</i>	5-digit hexadecimal value (20 bits). The PDC PIL for the program. If the network conforms to VPS, then this field contains the VPS label for the program. If neither VPS nor PDC is supported, this field shall contain timer control codes as specified in ETSI TR 300 231	<i>pil=FFFFE</i>
Start time	<i>sta=start_time</i>	Defines the start date/time of the enclosed program. The <i>time</i> format conforms to ISO 8601, except that it is assumed to be UTC. A recommended usage is the form <i>yyyymmddThhmmss</i> , where the capital letter T separates the date from the time. It is possible to shorten the time string by reducing the resolution. For example, <i>yyyymmddThhmm</i> (no seconds specified) is valid	<i>sta=20001103T2030</i>
Duration	<i>dur=time</i>	Defines the duration in number of minutes of the enclosed program	<i>dur=90</i>

If only the CNI parameter is defined, the decoder should go to the channel broadcasting, the CNI, and stay there even if the TeleWeb application is closed.

5.3.3.2 Profile parameter

This parameter, shown in Table 5, ensures the upgrade compatibility to future higher profile services.

Table 5 – Profile parameter

Parameter	Syntax	Format	Example
Profile	<code>Pro=profile</code>	The profile parameter indicates the profile of the referenced page. This parameter should not be defined if the link is referencing a Superteletext profile page. For a Superteletext profile decoder, the presence of the profile parameter indicates that the link is referencing a higher profile page. As a result the decoder displays the profile upgrade page 10.4 The format of the parameter value will be defined in the specification documents for future profiles. Be aware that this parameter is only needed when the profile domain border is crossed from a lower to a higher profile	<code>pro=...</code>
NOTE The parameter value of the example can be any text excluding “;”.			

This subclause is merely informative and does not specify required service names, path names or query parts.

5.3.4 Examples

```
<BASE HREF="tw://base/today/news/local">
<A NAME=top></A>
```

a lot of text ...

```
<A NAME=ex-1 HREF="tw://sport/football.htm">Latest Football News</A>
<A NAME=ex-2 HREF="sport/football.htm"> Today's Football Program</A>
<A NAME=ex-3a HREF="/tomorrow/program.htm#football"> Tomorrow's Football Program
</A>
<A NAME=ex-3b HREF=".../tomorrow/program.htm#football"> Tomorrow's Soccer Program
</A>
<A NAME=ex-4 HREF="#top"> Return to the top of the document </A>
```

NOTE The document context is set by the BASE element to `tw://base/today/news/local`. Anchor EX-1 is an absolute reference to the service "sport", page "football.htm". Anchor EX-2 is a relative reference equivalent to `tw://base/today/news/sport/football.htm`. Anchors EX-3a and EX-3b are both equivalent to `tw://base/tomorrow/program.htm#football`, the football anchor on the program.htm page. Anchor EX-4 is a reference to the TOP anchor in the current document.

5.4 Teletext page reference scheme

A page in a Teletext service can be referenced by a hyperlink using the URL syntax

ttx : *// cni / page_number [/ page_subcode]*

where the sequence is not case-sensitive and

ttx	identifies the scheme specific part as a Teletext page URL.
<i>// cni</i>	The country and network identification (CNI) code for the broadcaster as defined in ETSI TR 101 231. If a 3-character VPS CNI code has to be used, it shall be preceded with 0. The value 0000 shall be interpreted as the TV channel of the TeleWeb service the URL is used in.

<i>/ page_number</i>	A 3 hexadecimal character value in the range 0×100 to 0×8FF representing the magazine, page tens and page units values respectively of a Teletext page as defined in ETSI EN 300 706.
<i>/ page_subcode</i>	A 4 hexadecimal character value in the range 0×0000 to 0×3F7F representing the S4, S3, S2 and S1 values respectively of a Teletext page subcode as defined in ETSI EN 300 706. The value 0×3F7F shall indicate that no particular subcode value is being defined. S2 has a valid range of 0 to 7, and S4 a valid range of 0 to 3. The inclusion of a page_subcode element is optional.

Processing Teletext links is mandatory if the set also has a Teletext decoder on board. This specification point is supplemented by the following paragraph adding extra requirements to the decoder.

A decoder manufacturer should provide the users with the means to return to the TeleWeb page where they originally left the TeleWeb application, through a Teletext link, to the Teletext application. In the meantime, the users can browse Teletext pages with the functionality provided to them through the Teletext application. Once they have finished browsing Teletext pages, the users shall be able to return to the TeleWeb page that they initially left.

It is up to the decoder manufacturer if this is achieved with an extra button, menu, or any other user interface aspect, as long as it is obvious to the user how to use it.

The handling of "not available" Teletext pages is also the responsibility of the decoder manufacturer. One possible solution could be to change the colour of the cursor to the colour used for unavailable TeleWeb pages.

On processing a link to a Teletext page, a decoder should display the most recent version of the page available. Handling of rolling sequences of pages is at the discretion of the decoder manufacturer.

5.5 NexTView reference scheme

A nexTView Listing can be invoked by a hyperlink using the URL syntax

nextview : *// cni ? filter-criteria*

where the sequence is not case-sensitive and

nextview	identifies the following sequence as a nexTView URL.
<i>// cni</i>	The country and network identification (CNI) code for the broadcaster as defined in ETSI TS 101 231. If a 3-character VPS CNI code has to be used, it shall be preceded by 0. The value 0000 shall be interpreted as the TV channel of the TeleWeb service the URL is used in.

The CNI code uniquely identifies the nexTView service because there may be at most one nexTView service per channel.

? *filter-criteria*

A list of keyword-value pairs. The pairs are separated by semicolons. A keyword is separated from a value by an equality sign. The order and presence of keyword-value pairs is arbitrary. The keyword-value pairs that shall be recognized are listed in Table 10. The interpretation of keyword value pairs is specified in ETSI EN 300 707.

The decoder shall generate a listing according to the defined filter criteria. If no filter criteria are defined, it is up to the decoder where to enter the nexTView application.

TeleWeb decoders are not required to support nexTView. If unsupported, nexTView links are ignored by the decoder.

5.6 Special function URLs

To accommodate embedded browser control, three special function URLs are defined.

Table 6 – Special function URLs

URL	Description
function:forward	Displays the next page in the history
function:back	Displays the previous page in the history
function:home	Displays the home page

If one of the pages is not available no display action is executed.

6 Text and hypertext

The text content of a TeleWeb service is based on HTML [HTML3.2][HTML4.0]. The HTML tags and attributes that are supported are described in this clause.

Other HTML tags and attributes that are not listed in this clause shall be ignored by decoders designed to this specification. These are summarized in Annex A, but the DTD in Annex D is definitive. A decoder should only ignore the unsupported tags and attributes and should still execute any valid text, tags or attributes enclosed by such tags. Unsupported tags and attributes may appear in the transmitted files.

To assist in achieving uniformity of display across all decoders, the tag definitions in this clause include mandatory display-related aspects that do not appear in the HTML specification [HTML3.2][HTML4.0]. Additional rendering information can be found in the TeleWeb default style sheet defined in Annex E.

6.1 TeleWeb HTML file format

The processing of a TeleWeb HTML file shall be limited to the constructs in the TeleWeb DTD, including character entity references (both named and numeric character specification strings). Excluded from interpretation are SGML (meta-) constructs such as mark-up declarations (for example, <! ... >), processing instructions (for example, <? ... >, including XML declarations and tags) and marked sections (for example, <[CDATA[...]]>). These excluded elements may be ignored or treated as data. Also excluded are function character references (for example, &#SPACE, &#RS, &#RE, etc.) and the encoding of functional characters as character entity references. All character entity references should be interpreted as denoting data characters.

6.1.1 Tags and attributes

A TeleWeb HTML tag has the general form: **<tag_name attribute_1 attribute_2>** where *tag_name* identifies the tag, and *attribute_1, attribute_2 ...* are any number of modifying attributes, including zero. The angled brackets, **< >**, are mandatory. In the HTML tag definitions, items that are optional, for example, text, attributes or closing tags, are shown in {braces}.

For some tags, there is a complementary closing tag of the form **</tag_name>**. This type of tag is referred to as a container.

In general, any tags occurring within the container have no effect outside of it. Tags without complementary closing tags are called 'empty tags'.

Text strings entered as values for tag attributes, for example, NAME = *text_string*, shall be enclosed in quotation marks if the string contains white space or special characters, for example, NAME = "text string".

Tags not specified in the TeleWeb DTD should be ignored.

Tags not specified within a container should be ignored within the container. Tags allowed in a container's enclosing context may be assumed to close the container.

6.1.2 Text

Any text outside of a tag but within the body section (see 6.3.4) is to be regarded as text to be displayed in the content area. The appearance of this text will depend upon any preceding tags.

6.1.2.1 Spaces and tabs

Except within preformatted elements (PRE), decoders shall treat all sequences of spaces (0x20), tabs (0x09), newlines (0x0A) and carriage returns (0x0D) within CDATA and PCDATA as a single-space character.

Within attribute values, leading and trailing spaces shall be ignored.

Within preformatted elements, a tab shall be replaced by from 1 to 8 space characters such that the last space inserted shall be the *n*th character on the line, where *n* is an integral multiple of 8.

Within preformatted elements, all space characters shall be treated as data (i.e. each shall appear in the output, there shall be no merging). A new line, or a carriage-return, or a carriage-return and new-line pair (whichever is the longest match) shall signal a line-feed/new-line position.

6.1.3 File structure

Each TeleWeb HTML file shall contain a maximum of one document. The minimum document is an empty file.

The generic contents of an HTML file for TeleWeb applications are shown in Figure 3.

```

<!DOCTYPE HTML-TW PUBLIC "Profile 1.0">
<HTML>
  <HEAD>
    :
    :
    :
  </HEAD>
  <BODY>
    :
    :
    :
  </BODY>
</HTML>

```

(Header section)

(Body section)

IEC 688/05

Figure 3 – Generic contents of an HTML file for TeleWeb use

The `<!DOCTYPE>` tag identifies the version of TeleWeb HTML in use. The correct syntax for services designed to this specification is given in 6.3.1. The use of this tag is not mandatory for services designed to this specification.

The `<HTML>` and `</HTML>` tags enclose the header and the body sections. The use of these tags is not mandatory. A decoder should interpret the end of the file as equivalent to an `</HTML>` tag.

The `<HEAD>` and `</HEAD>` tags enclose the header section. The use of these tags is not mandatory. The header section contains data applicable to the entire document. This can include the title of the document. A decoder shall ignore any text immediately within the header section. To clarify: text immediately within the header section (i.e. PCDATA) occurs at the top level, i.e. it is not enclosed within a header element, for example, `TITLE`. Thus, title text is not ignored, but any text characters immediately preceding the title start tag, or immediately following the title end tag, shall be ignored.

The `<BODY>` and `</BODY>` tags enclose the body section. The use of these tags is not mandatory. The body section contains the text and hypertext links to be displayed in the content area. In the absence of a `BODY` tag, the first occurrence of a tag defined in the DTD as being within the body section shall be interpreted by a decoder as the start of the body section.

6.2 Syntax of TeleWeb HTML tags

TeleWeb HTML tags and attributes described in this subclause are mandatorily supported by every TeleWeb browser although the use of these tags and attributes may be optional in a TeleWeb HTML document.

6.2.1 Guidelines for content providers: XHTML conformance.

Where appropriate, the syntax restrictions in the XHTML specification [XHTML1.0] should be applied.

Documents should be well-formed. The nesting should be correct.

Element and attribute names should be in lower-case characters. However, conforming browsers shall accept upper- and lower-case element and attribute names equivalently.

For non-empty elements, end tags should be included. However, conforming browsers shall treat omissible end tags correctly.

Attribute values should always be quoted. However, conforming browsers shall treat unquoted numeric and alphanumeric values correctly.

Attribute names should always be present. However, conforming browsers shall correctly accept unnamed attribute values where the value is identical to the name and can have no other value, for example, compact.

Empty tags should end with `/>`. However, conforming browsers should not require this behaviour nor should they be broken by it.

White space at the beginning or end of an attribute value should not be considered significant; furthermore, a sequence of white-space characters within an attribute value should be considered equivalent to a single-space character.

No CDATA sections should be put in documents, as they are not supported.

The ID attribute should be preferred to the deprecated NAME attribute for fragment identification; but, for backward compatibility, use NAME with an identical value in elements that declare a name attribute.

6.2.2 Characters

All tags shall only use characters from the ASCII character set.

Character entity references are always treated as data. This requirement is at variance with SGML usage but is enforced to simplify implementation and match the behaviour of existing Internet browsers.

Upper- or lower-case characters can be used and in any combination.

Keywords within tags (for example, style, align) shall be written in full and only using the specified spellings.

NOTE American spellings are used for certain keywords, for example, colour, centre.

6.2.3 White space

White space is any combination of blank (0x20), tab (0x09), carriage-return (0x0D) and new-line (0x0A) characters.

The tag (or element) name shall follow the tag open symbol ('<') immediately, without intervening white space. Attribute names shall be preceded by white space and may be followed by white space. Attribute values may be preceded by white space and may be followed by white space.

Thus, for example, `<P ALIGN = LEFT >` is equivalent to `<P ALIGN=LEFT>`, but `< P>` is not allowed.

6.2.4 Short tag

The SHORTTAG feature is not supported. The only form of attribute minimization supported is where the only legitimate attribute value is identical to the attribute name, for example, `COMPACT = COMPACT` may be written as just `COMPACT`. Examples of unsupported notation include `<html<head><title/hello/<body></></html>`.

6.2.5 Attributes

All attributes are optional unless otherwise stated. There shall be a maximum of one attribute of each permitted type per tag.

Attributes can be listed in any order within a tag.

Unsupported attributes may appear in the tags, but these attributes should be ignored. In the case of an unknown attribute value, the attribute should be ignored.

6.2.5.1 Colour attributes

Colours can be denoted in two ways.

- 1) "#RRGGBB" where RR, GG and BB are case-insensitive hexadecimal representations of values in the range 00 to FF that define the amplitude of the red, green and blue components respectively. Example: <BODY BGCOLOR = "#1E47DA">
- 2) *standard_colour* where *standard_colour* is one of the named colours defined below. The colour names are not case-sensitive. Example: <BODY BGCOLOR = "Yellow">

Named colours

BLACK = "#000000" GRAY = "#808080" SILVER = "#C0C0C0" WHITE = "#FFFFFF"
 MAROON = "#800000" RED = "#FF0000" PURPLE = "#800080" FUCHSIA = "#FF00FF"
 GREEN = "#008000" LIME = "#00FF00" OLIVE = "#808000" YELLOW = "#FFFF00"
 NAVY = "#000080" BLUE = "#0000FF" TEAL = "#008080" AQUA = "#00FFFF"

NOTE 1 The standard HTML values are not supported by the TeleWeb default colour palette. Decoders that use only that palette should substitute the hexadecimal value 7F for the value 80 in the RR GG BB values given above.

NOTE 2 For robustness, the colour name GREY should be treated as equivalent to the standard colour GRAY.

NOTE 3 The predefined colour SILVER is not supported by the TeleWeb default colour palette. Decoders that use only that palette should use the colour #D4D4D4 (colour index 138, see Annex B) instead.

6.3 Document structure elements

6.3.1 <!DOCTYPE> document type definition tag

Function: Defines the version of HTML used to author the document.

Format: <!DOCTYPE {version number}>

Attributes: None

Use: For files compatible with this specification, the tag shall be entered as

<!DOCTYPE HTML-TW PUBLIC "Profile 1"> with white space between each string.

If present, it shall be the first line of a file. It shall occur no more than once in a file. If this tag is present the browser should discard every tag not supported by the TeleWeb Superteletext profile.

6.3.2 <HTML> hypertext mark-up language tag

Function: Encloses an HTML document.

Format: <HTML> ... </HTML> (start and end tags are optional).

Attributes: None

Use: The inclusion of this tag is optional. No particular response is expected of a decoder if it is present. It shall occur no more than once in a file. Text following the end tag shall be ignored.

6.3.3 <HEAD> document header tag

Function: Encloses the header section of the document.

Format: <HEAD> ... </HEAD> (start and end tags are optional).

Attributes: None

Use: The inclusion of this tag is optional. No particular response is expected of a decoder if it is present. It shall occur no more than once in a file. A decoder shall ignore any text immediately within the header section. Text contained within the title tag is not ignored, since the element is expected and contains the text itself.

6.3.4 <BODY> document body tag

Function: Encloses the body section of the document. Text within the body section shall be displayed in the content area.

Format: <BODY {attribute_1} {attribute_2} ... > ... </BODY> (start and end tags are optional).

Attributes: ALINK, BACKGROUND, BGCOLOR, BOTTOMMARGIN, LEFTMARGIN, LINK, RIGHTMARGIN, TEXT, TOPMARGIN, VLINK, TRANSPARENCY

Use: The inclusion of this tag is optional. No particular response is expected of a decoder if it is present. It shall occur no more than once in a file. The contents of the body section can consist of an unordered collection of any tag defined starting with 6.5 until the end of Clause 6.

ALINK attribute

Function: Defines the foreground colour for a hypertext link at the moment it is activated while waiting for the new page to be displayed.

Format: ALINK = *colour* The format of *colour* is defined in 6.2.5.1.

Use: A decoder is allowed to treat the ALINK colour as a recommendation and can indicate that a link has been activated in any way it chooses.

BACKGROUND attribute

Function: Defines the URL of an image file to be displayed on the background image plane.

Format: BACKGROUND = TeleWeb *url* The format of *url* is defined in 5.3.

Use: In the absence of this attribute, the background colour will be displayed (see BGCOLOR) in coordination with the transparency value. Animation of background images is not supported.

BGCOLOR attribute

Function: Defines the colour to be displayed on the background colour plane.

Format: BGCOLOR = *colour* The format of *colour* is defined in 6.2.5.1.

Use: The stated colour shall be used to fill completely that part of the background colour plane visible within the content area. If this attribute is not defined, then it is up to the decoder to choose the background colour.

BOTTOMMARGIN attribute

Function: This attribute specifies the bottom margin for the entire body of the page in pixels and overrides the default margin. When set to zero (0), the bottom margin is the bottom edge of the window in which the content is displayed.

Format: BOTTOMMARGIN = *unsigned_integer*

LEFTMARGIN attribute

Function: This attribute specifies the left margin for the page in pixels, overriding the default margin. When set to zero (0), the left margin is the left edge of the window in which the content is displayed.

Format: LEFTMARGIN = *unsigned_integer*

LINK attribute

Function: Defines the foreground colour for a hypertext link that has not been visited and is not activated.

Format: LINK = *colour* The format of *colour* is defined in 6.2.5.1.

Use: If this attribute is not defined, then it is up to the decoder to choose the colour.

RIGHTMARGIN attribute

Function: This attribute specifies the right margin for the page in pixels, overriding the default margin. When set to zero (0), the right margin is the right edge of the window in which the content is displayed.

Format: RIGHTMARGIN = *unsigned_integer*

TEXT attribute

Function: Defines the default foreground colour for the text of the document.

Format: TEXT = *colour* The format of *colour* is defined in 6.2.5.1.

Use: If this attribute is not defined, then it is up to the decoder to choose the colour.

TOPMARGIN attribute

Function: This attribute specifies the top margin for the page in pixels, overriding the default margin. When set to zero (0), the top margin is the top edge of the window in which the content is displayed.

Format: TOPMARGIN = *unsigned_integer*

TRANSPARENCY attribute

Function: Defines the opacity of the background colour to underlying video.

Format: TRANSPARENCY = *unsigned_integer*

Use: If this attribute is not defined, then total opacity is assumed.

VLINK attribute

Function: Defines the preferred foreground colour for a hypertext link that has been visited.

Format: VLINK = *colour* The format of *colour* is defined in 6.2.5.1.

Use: If this attribute is not defined, it is up to the decoder to choose the colour. To increase the manufacturers' control over look-and-feel, this value is only a recommendation.

6.3.5 <!-- --> Comment tag

Function: Allows editorial comments to be embedded within an HTML file.

Format: <!-- {comment text} -->

Attributes: None

Use: The use of this tag is optional. It can be used anywhere within a file apart from the first line if a <!DOCTYPE> tag is included. All text within comment tags shall be ignored by decoders designed to this specification to ensure future backwards compatibility.

Comments may not be nested.

6.4 Header section tags

Only the tags defined in this subclause should be used between <HEAD> and </HEAD> tags. In the absence of a <HEAD> tag, the first occurrence of one of these elements shall signify the start of the header section.

6.4.1 <LINK> link structure tag

Function: Identifies the relationship of the current document to other documents.

Format: <LINK {attribute_1} {attribute_2} ... >

Attributes: REL, HREF, REV, TITLE

Use: This tag may only be used within the header section. There can be multiple instances. A decoder may choose to ignore this tag.

Example: <LINK REL = NEXT HREF = page_2.htm> , implying file *page_2.htm* is the next in the sequence.

HREF attribute

Function: Defines the address of the linked resource.

Formats: HREF = *TeleWeb URL*, see 5.3
 HREF = *Teletext page URL*, see 5.4
 HREF = *nexTView URL*, see 5.5

REL attribute

Function: Defines the relationship of the linked resource to the current document. Relationship can be any string.

Formats: REL = *relationship*

Examples for relationship: NEXT, PARENT, PREVIOUS, SAME, TOP, CONTENTS, INDEX, GLOSSARY, COPYRIGHT, HELP, SEARCH,...

REV attribute

Function: Defines a reverse relationship. A link from document A to document B with REV = *relationship* expresses the same relationship as a link from B to A with REL = *relationship*. Relationship can be any string.

Formats: REV = *relationship*

Examples for relationship: NEXT, PARENT, PREVIOUS, SAME, TOP, CONTENTS, INDEX, GLOSSARY, COPYRIGHT, HELP, SEARCH,...

TITLE attribute

Function: Provides an advisory title for the linked resource.

Formats: TITLE = *text_string*

The TITLE attribute may be ignored by a decoder.

6.4.2 <TITLE> title tag

Function: Encloses the title of the document.

Format: <TITLE> *title text* </TITLE>

Attributes: None

Use: The inclusion of this tag is required. No particular response is expected of a decoder if it is present. It shall occur no more than once in a file. The content of the TITLE element is PCDATA. This means that no further mark-up is allowed.

However, character entities (= named characters) are supported. If a decoder chooses to present the title, it shall be displayed outside of the content area.

6.4.3 <BASE> tag

Function: Defines a base URL for resolving relative URLs. When present, it shall appear before any HEAD section.

The start tag is **required** and the End tag is **forbidden**.

Format: <BASE HREF = *url* >

Attributes: Mandatory HREF element

Use: The inclusion of this tag is optional. It provides the base URL for de-referencing relative URLs.

HREF attribute

Function: Defines the address of the base.

Formats: HREF = *url*, see Clause 5.

6.5 Paragraph formatting**6.5.1 <P> paragraph tag**

Function: The enclosed text is classified as a paragraph. Extra space is inserted at the end and at the start of a paragraph (see Clause 7).

Format: <P {attribute} > ... </P> (The end tag is optional.)

Attribute: ALIGN

ALIGN attribute

Function: Defines the horizontal alignment of the paragraph relative to the current margins of the document. Alignment is only valid within the paragraph in which it has been defined.

Format: ALIGN = *position*

position:	LEFT :	The paragraph shall be rendered flush left.
	RIGHT :	The paragraph shall be rendered flush right.
	JUSTIFY :	The paragraph shall be rendered flush left and flush right by adjusting the width of the white space between the words.
	CENTER :	The paragraph shall be centred.

Use: In the absence of an ALIGN attribute, the default alignment is LEFT.

**6.5.2
 line break tag**

Function: Forces a line break. The CLEAR attribute allows text to be positioned relative to images.

Format: <BR {attribute}>

Attribute: CLEAR

Use: The text immediately after the tag shall start on the following line. Existing alignment conditions are preserved. In the absence of a CLEAR attribute, CLEAR = NONE shall be assumed.

CLEAR attribute

Function: Defines how the text should be positioned relative to images.

Format: CLEAR = *position*

position:	LEFT :	Clears text that flows around left-aligned images to the next full left margin.
	RIGHT :	Clears text that flows around right-aligned images to the next full right margin.
	ALL :	Clears text until it can reach both full margins.
	NONE :	Introduces a "carriage return" and nothing more.

6.5.3 <Hn> heading tags, <H1> through <H6>

Function: These tags implement six levels of document headings; <H1> is the most prominent one and <H6> is the least prominent.

Format: <Hn {attribute} > ... </Hn> where n is an integer in the range 1 to 6 inclusive. The </Hn> closing tag is mandatory.

Attributes: ALIGN

Use: In the absence of the ALIGN attribute, the text shall be positioned LEFT. This can be overridden by an enclosed <DIV> or <CENTER> tag. Nesting of heading tags is not permitted.

ALIGN attribute

Function: Defines the horizontal alignment of the enclosed text relative to the current margins. Alignment is only valid for the heading in which it has been defined.

Format: ALIGN = *position*

position:	LEFT :	The heading shall be rendered flush left.
	RIGHT :	The heading shall be rendered flush right.
	CENTER :	The heading shall be centred.
	JUSTIFY :	The heading shall be rendered flush left and flush right by adjusting the width of the white space between the words.

6.5.4 <DIV> division tag

Function: Allows a document to be structured as a hierarchy of divisions.

Format: <DIV {attribute_1}> ... </DIV>

Attributes: ALIGN

ALIGN attribute

Function: Defines the horizontal alignment of the enclosed text relative to the current margins. Alignment is only valid for the division in which it has been defined.

Format: ALIGN = *position*

position:	LEFT :	The heading shall be rendered flush left.
	RIGHT :	The heading shall be rendered flush right.
	CENTER :	The heading shall be centred.
	JUSTIFY :	The division shall be rendered flush left and flush right by adjusting the width of the white space between the words.

6.5.5 <CENTER> centre text tag

Function: The enclosed text is displayed centred (equivalent to the <DIV ALIGN = CENTER> tag).

Format: <CENTER> ... </CENTER>

Attributes: None

Use: The enclosed text is positioned centred relative to the current left and right margins.