

RECOMMENDATION ITU-R BT.1119-2*

WIDE-SCREEN SIGNALLING FOR BROADCASTING

(Signalling for wide-screen and other
enhanced television parameters)

(Question ITU-R 42/11)

(1994-1995-1998)

The ITU Radiocommunication Assembly,

considering

- a) that 16:9 wide-screen television receivers are increasingly being made available to the public in 525-line and 625-line countries. The advent of a wide-screen receiver market is leading programme producers to consider the production aspects of wide-screen programmes that will be shown on 4:3 displays as well as 16:9 displays;
- b) that provision for a common system for optimizing the display of the original programme material on a suitably equipped 16:9 display device would be a valuable enhancement to the service provided, together with the means to make appropriate automatic arrangements for any subtitling;
- c) that there would be benefits for multi-standard receivers and, recorders, and costs, if a unique signalling system were used for all television standards,

recommends

- 1 that for broadcasters wishing to broadcast a wide-screen signalling system, the system given in Annex 1 should be used for 625-line analogue broadcasts and the system in Annex 2 should be used for 525-line analogue broadcasts.

ANNEX 1

1 Scope

This specification is applicable to 625-line PAL and SECAM systems in use in cases where wide-screen signalling is to be provided by the broadcasters for use by new 16:9 television receivers.

It specifies the wide-screen signalling information, the coding and the way of incorporating the coded information into a 625-line system.

The wide-screen signalling information contains information on the aspect ratio range of the transmitted signal and its position as it would appear on a conventional 4:3 display and on the position of the subtitles and on the camera/film mode. Furthermore some bits are reserved for future EDTV signalling (e.g. PALplus, see Recommendation ITU-R BT.1197) as well as for future use.

This Annex specifies the transmitted signal. Appendix 1 gives the rules of operation for the minimum requirements for receiver display formats as well as for subtitling. Appendix 2 gives some recommended practices.

* This Recommendation should be brought to the attention of the European Broadcasting Union (EBU) and the European Telecommunications Standards Institute (ETSI).

2 Normative references

This Recommendation does not incorporate any normative reference.

3 Definitions

For the purpose of this Recommendation, the following definition applies:

Letterbox operation: the transmission of a picture format with an aspect ratio greater than 1.33, in such a way that empty (black) lines are added to conform to a 4:3 transmission format.

3.1 Symbols and abbreviations

a :	aspect ratio
F_s :	clock frequency
T_d :	data bit period
T_s :	sampling period
TXT:	teletext.

4 Requirements

4.1 Line code

The following sections specify the line code of the wide-screen signalling.

4.1.1 Position

The signalling bits shall be transmitted as a data burst in the first part of line 23. The position of the beginning of the wide-screen signalling bits shall be $11.0 \pm 0.25 \mu\text{s}$ from O_H of the horizontal sync, as indicated in Fig. 1.

In each frame the first part of line 23 shall be occupied with the wide-screen signalling.

4.1.2 Clock frequency

The clock frequency shall be: $F_s = 5 \text{ MHz } (\pm 1 \times 10^{-4})$.

The period shall be: $T_s = 200 \text{ ns}$.

4.1.3 Signal waveform

The signal waveform shall be approximately a sine squared pulse.

The half amplitude pulse duration shall be: $200 \pm 10 \text{ ns}$.

4.1.4 Signal amplitude

The signal amplitude with respect to a maximum video signal amplitude of 700 mV shall be:

$$500 \text{ mV} \pm 5\%.$$

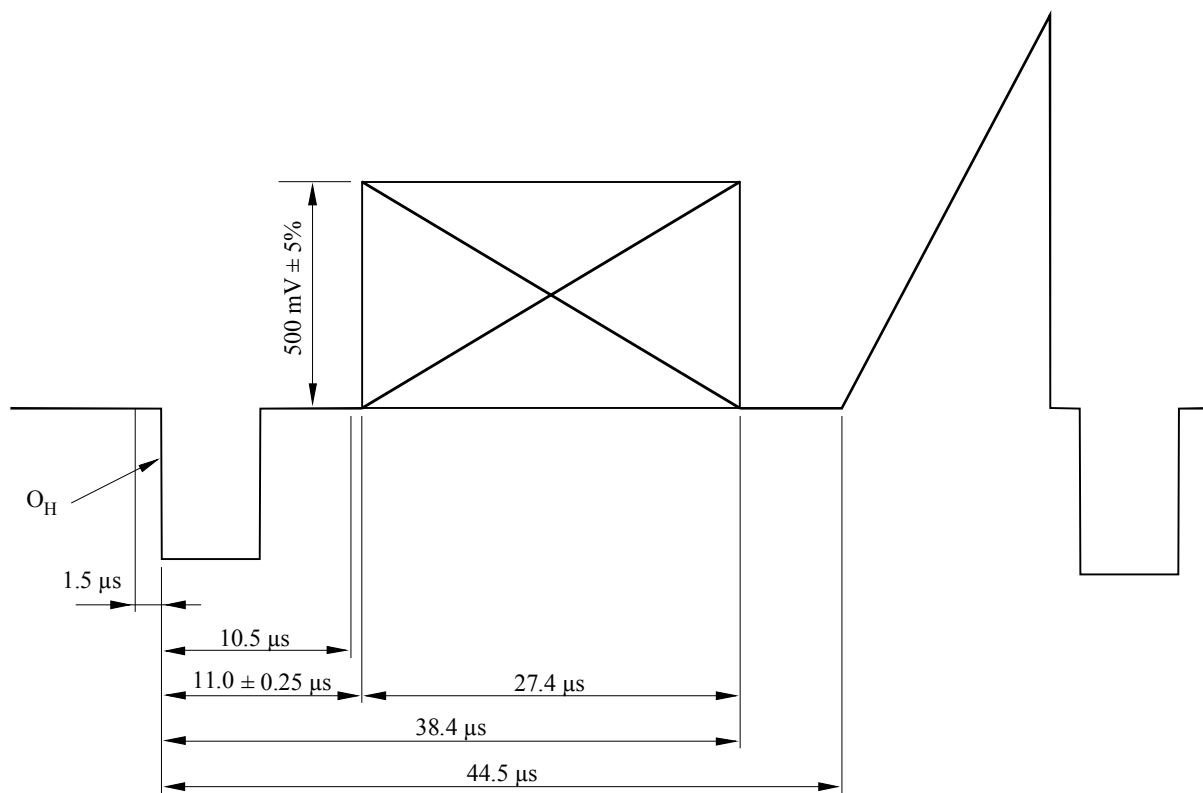
4.1.5 Modulation coding

Bi-phase coding shall be used in accordance with Fig. 2.

Duration of one data bit: T_d .

Figure 1: Position of the wide-screen signalling bits

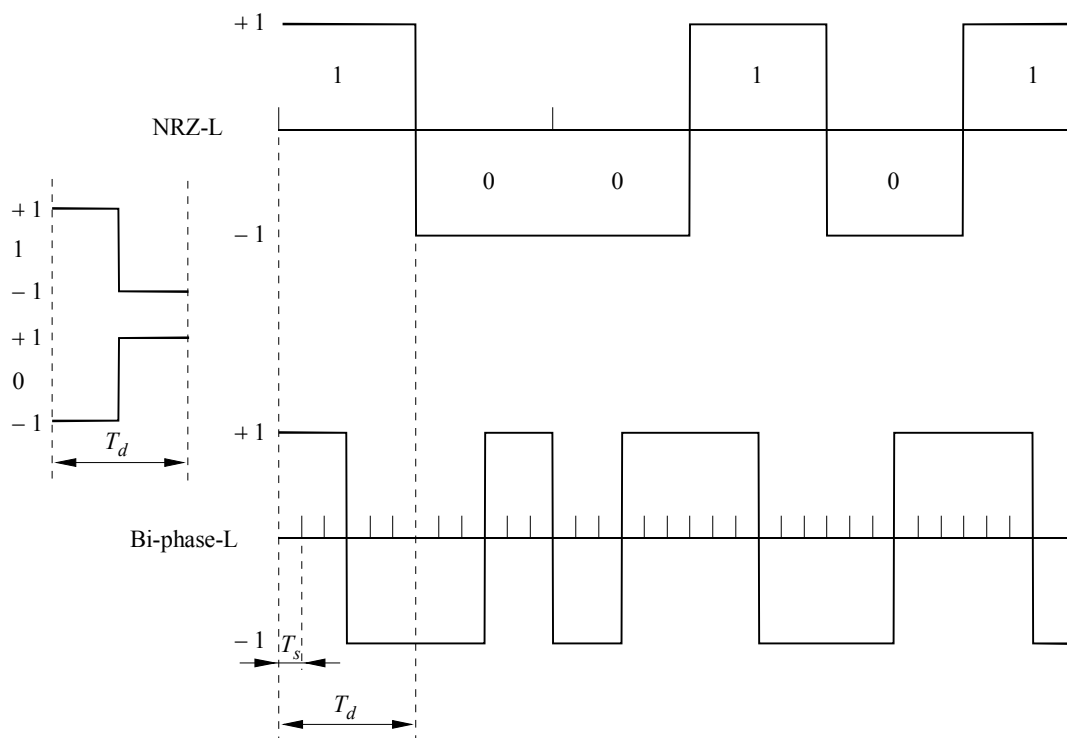
FIGURE 1
Position of status bit signalling in line 23



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FIGURE 2

Example of bi-phase-L coding



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The data bits shall be inserted in NRZ-L at the input of the (bi-phase-L) code modulator. The code modulator will produce on line 23, the data in bi-phase-L code, in which one data bit period equals 2×3 clock periods, whereby:

$$T_d = 6 T_s$$

4.1.6 Preamble

The preamble contains a run-in and a start code. The preamble shall be in accordance with Table 1.

4.1.7 Data bits

There shall be 14 bits in total. One of these 14 bits shall be allocated to the error detection code. There shall be 13 data bits available for transmission of information. The data bits shall be grouped in four data groups (see Table 1).

4.1.8 Odd parity bit

For error detection, an odd parity bit has been introduced. The odd parity bit shall belong to the first three data bits only (see Table 1).

TABLE 1
Status bits transmission scheme

Status bits transmission Insertion: first half of line 23 Coding: bi-phase modulation coding Clock: 5 MHz ($T_s = 200$ ns)					
Run-in	Start code	Group 1 Aspect ratio	Group 2 Enhanced services	Group 3 Subtitles	Group 4 Reserved
29 elements based on 5 MHz	24 elements based on 5 MHz	24 elements based on 5 MHz	24 elements based on 5 MHz	18 elements based on 5 MHz	18 elements based on 5 MHz
		Bit numbering 0 1 2 3 LSB MSB per info bit ⁽¹⁾ "0" = 000 111 "1" = 111 000	Bit numbering 4 5 6 7 LSB MSB per info bit ⁽¹⁾ "0" = 000 111 "1" = 111 000	Bit numbering 8 9 10 LSB MSB per info bit ⁽¹⁾ "0" = 000 111 "1" = 111 000	Bit numbering 11 12 13 LSB MSB per info bit ⁽¹⁾ "0" = 000 111 "1" = 111 000
$0 \times 1F1C\ 71C7$ 1 1111 0001 1100 0111 0001 1100 0111	$0 \times 1E\ 3C1F$ 0001 1110 0011 1100 0001 1111	3 2 1 0 bit number 1000 full format 4:3 0001 box 14:9 centre 0010 box 14:9 top 1011 box 16:9 centre 0100 box 16:9 top 1101 box > 16:9 centre 1110 full format 14:9 centre shoot and protect 14:9 0111 full format 16:9 anamorphic b ₃ = odd parity bit	b ₄ film bit 0 camera mode 1 film mode b ₅ = colour coding bit 0 conventional coding 1 Motion Adaptative Colour Plus b ₆ = helper bit 0 no helper 1 modulated helper b ₇ = Reserved. Should be set to "0" until otherwise defined	8 bit number 0 no subtitles within teletext 1 subtitles within teletext 10 9 bit number 00 no open subtitles 01 subtitles in active image area 10 subtitles out of active image area 11 reserved	Reserved. Should all be set to "0" until otherwise defined

1 info bit consists of 6 elements based on 5 MHz clock.