

## EBU Technical Standard N10-1998

### Parallel interface for analogue component video signals

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This interface is designed to enable analogue component video signals to be carried by parallel interconnections between items of television production equipment.

This specification does not cover the interfaces needed for the connection of audio and auxiliary signals (time and control code, remote control, etc.) nor does it deal with the interfaces for composite video signals that are sometimes provided in equipment of this type.

### 1. Types of signal carried by the interface

Three separate connections should be provided to carry the following components of the video signal:

- Luminance signal (with sync);
- Red colour difference signal (without sync);
- Blue colour difference signal (without sync).

In practice, these signals are generally represented by the symbols Y, R-Y, and B-Y but, in the following, the notation adopted by the ITU-R has been used:  $E'_Y$ ,  $E'_{CR}$  and  $E'_{CB}$ .

### 2. Wave form of the signal

The luminance signal  $E'_Y$ , should include sync pulses, line and field blanking in accordance with ITU-R Recommendation BT.470 [1] (tables 1,1.1 and 1.2).

The two colour difference signals  $E'_{CR}$  and  $E'_{CB}$  should include, line and field blanking in accordance with ITU-R Recommendation BT.470 [1] (tables 1,1.1 and 1.2). Neither signal should include sync pulse.

All three signals ( $E'_{CR}$  and  $E'_{CB}$ ) should be simultaneous in real time and carry time-coincident picture information.

The insertion of signals in the field-blanking period is reserved by the EBU. The use of lines 12/325 of the  $E'_{CR}$  /  $E'_{CB}$  signals for the identification of the colour fields in the case of preliminary composite processing is, however, under study. The use of other lines in the three signals to convey amplitude and phase reference signals is under study.

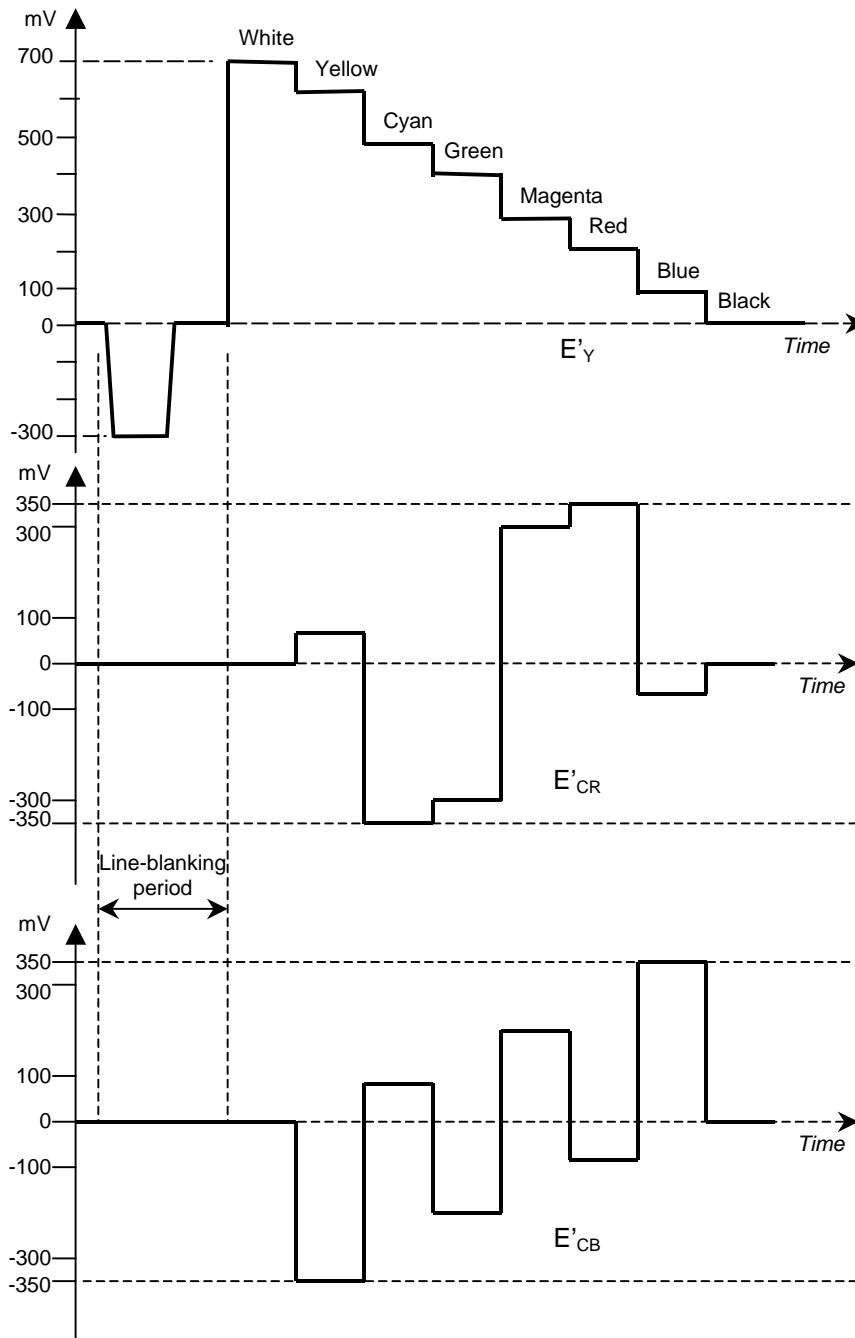
### 3. Electrical characteristics of the interface

#### 3.1. Luminance

The luminance signal is the same as that defined in ITU-R Recommendation BT.470. In accordance with Table II of that Recommendation, it is obtained from the primary signals by means of the equation:

$$E'_Y = 0.299 E'_R + 0.587 E'_G + 0.114 E'_B$$

Where  $E'_R$ ,  $E'_G$  and  $E'_B$  are the primary signals after gamma pre-correction. In this application, the amplitude range of the primary signals is 0.700 V.



**Fig. 1 - Waveform of video signals for 100/0/100/0 colour bars**

The amplitude of the  $E'_Y$  signal should comply with the following specifications:

Peak-to-peak amplitude (including syncs)      1 V

Nominal value of DC component:                      0 V at blanking level or AC coupled output.

Input and output impedance of the interface:

$$Z_0 = 75 \Omega \quad Z_1 = 75 \Omega$$

These characteristics of the signals are shown in *Fig. 1*.

### Colour-difference signals

The colour-difference signals are obtained from the  $E'_Y$  signal and the primary signals specified above. When the amplitude range of the primary signals is 0.7 V, the colour difference signals comply with the following equations, which are the same as those given in ITU-R Recommendation BT.601 [2].

$$E'_{CR} = 0.713 (E'_R - E'_Y)$$

$$E'_{CB} = 0.564 (E'_B - E'_Y)$$

The amplitude of the signals  $E'_{CR}$  and  $E'_{CB}$  should comply with the following specification:

Peak-to-peak amplitude of the signal: 0.700 V for 100/0/100/0 colour bars

0.525 V for 100/0/75/0 colour bars

Nominal value of DC component: 0 V at blanking level or AC coupled output.

Input and output impedance of the interface:

$$Z_o = 75 \Omega \quad Z_i = 75 \Omega$$

Neither of these signals includes sync pulses, but both include clamping periods.

The characteristics of the signals are shown in Fig. 1.

### 3.3. Pass-band

The specification does not require any limitation of the pass-band; if necessary, such limitations should be applied in the input stages of the equipment.

## 4. Mechanical characteristics

The interface for ENG equipment takes the form of type BNC connectors, with the female part mounted on the VTRs and other equipment.

## Bibliography

- [1] ITU-R Recommendation BT.470-4: **Television systems**
  - [2] ITU-R Recommendation BT.601-5: **Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios**
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