

RECOMMENDATION ITU-R BT.1729

**Common $16 \times 9/4 \times 3$ aspect ratio digital
television reference test pattern**

(Question ITU-R 97/6)

(2005)

Scope

This Recommendation specifies a reference test pattern which may be used with any of Recommendations ITU-R BT.601, ITU-R BT.1358, ITU-R BT.1543 or ITU-R BT.709. The pattern is designed for use in either 16×9 aspect ratio or 4×3 aspect ratio.

The ITU Radiocommunication Assembly,

considering

- a) that test patterns provide a convenient means of assessing chrominance and luminance performance in a television system;
- b) that although the requirements for test patterns differ between standard-definition and high-definition television (HDTV) digital formats, it is possible to construct a single test signal which may be successfully used for all of these formats;
- c) that such a common test pattern may be useful when broadcasting in multiple formats or when converting between formats;
- d) that the use of a common test pattern for all these formats can simplify test procedures and reduce the opportunity for misinterpretation of signal parameters and misalignment of systems,

recommends

- 1 that the parameters defined in Annex 1 should be implemented and may be used for production and distribution purposes in standard-definition and HDTV digital formats.

Annex 1**Common $16 \times 9/4 \times 3$ aspect ratio digital
television reference test pattern****Normative references**

Recommendation ITU-R BS.645	Test signals and metering to be used on international sound programme connections.
Recommendation ITU-R BT.471	Nomenclature and description of colour bar signals.
Recommendation ITU-R BT.601	Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios.

Recommendation ITU-R BT.709	Parameter values for the HDTV standards for production and international programme exchange.
Recommendation ITU-R BT.1358	Studio parameters of 625 and 525 line progressive scan television systems.
Recommendation ITU-R BT.1379	Safe areas of wide-screen 16:9 and standard 4:3 aspect ratio productions to achieve a common format during a transition period to wide-screen 16:9 broadcasting.
Recommendation ITU-R BT.1543	1 280 × 720, 16 × 9 progressively-captured image format for production and international programme exchange in the 60 Hz environment.

Purpose

The reference test pattern has several purposes:

- quality control of chrominance and luminance through the production chain;
- checking and adjusting the chrominance and luminance alignment of broadcast equipment, particularly video monitors;
- general testing of equipment for video production, emission and presentation;
- establish that a video circuit is active and that associated audio is available;
- check for audio-video synchronization;
- check for correct connection of audio channels and correct audio levels.

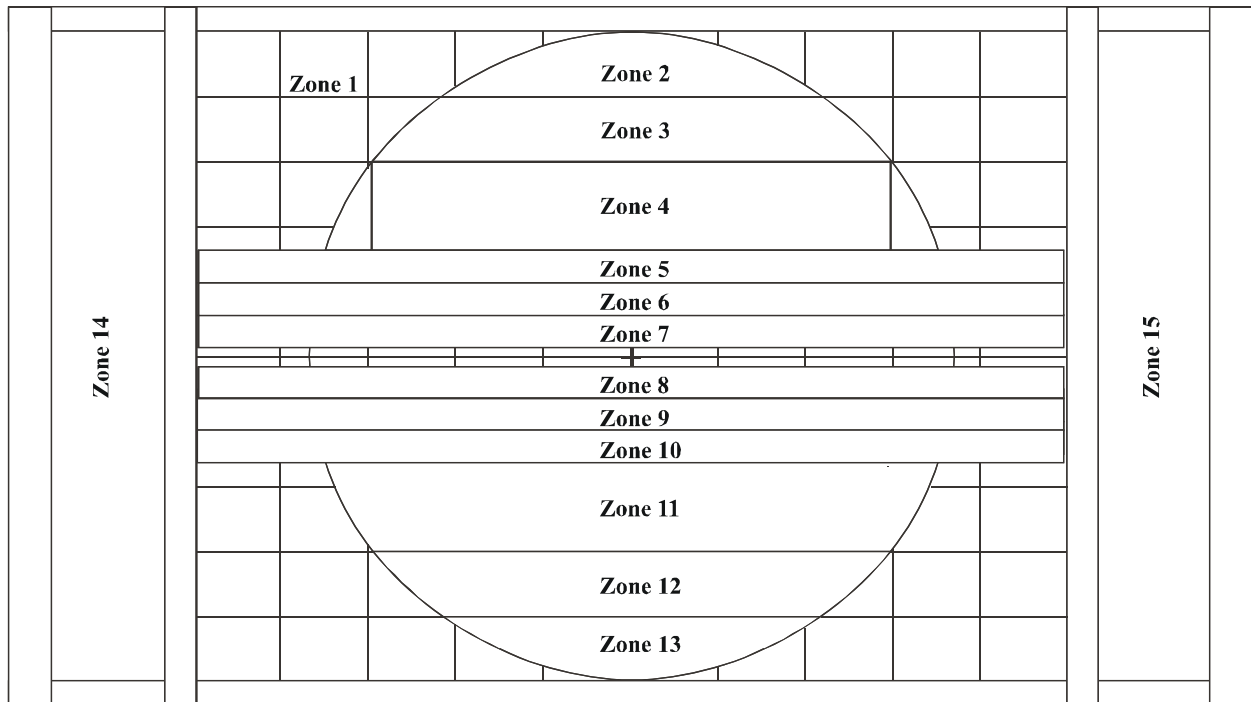
System types

The pattern described in this Recommendation is intended for use with Recommendations ITU-R BT.601, ITU-R BT.709, ITU-R BT.1358, or ITU-R BT.1543. These systems are distinguished by the proportions of their colour encoding (or “colorimetry”) and by their resolution.

Zones of test pattern

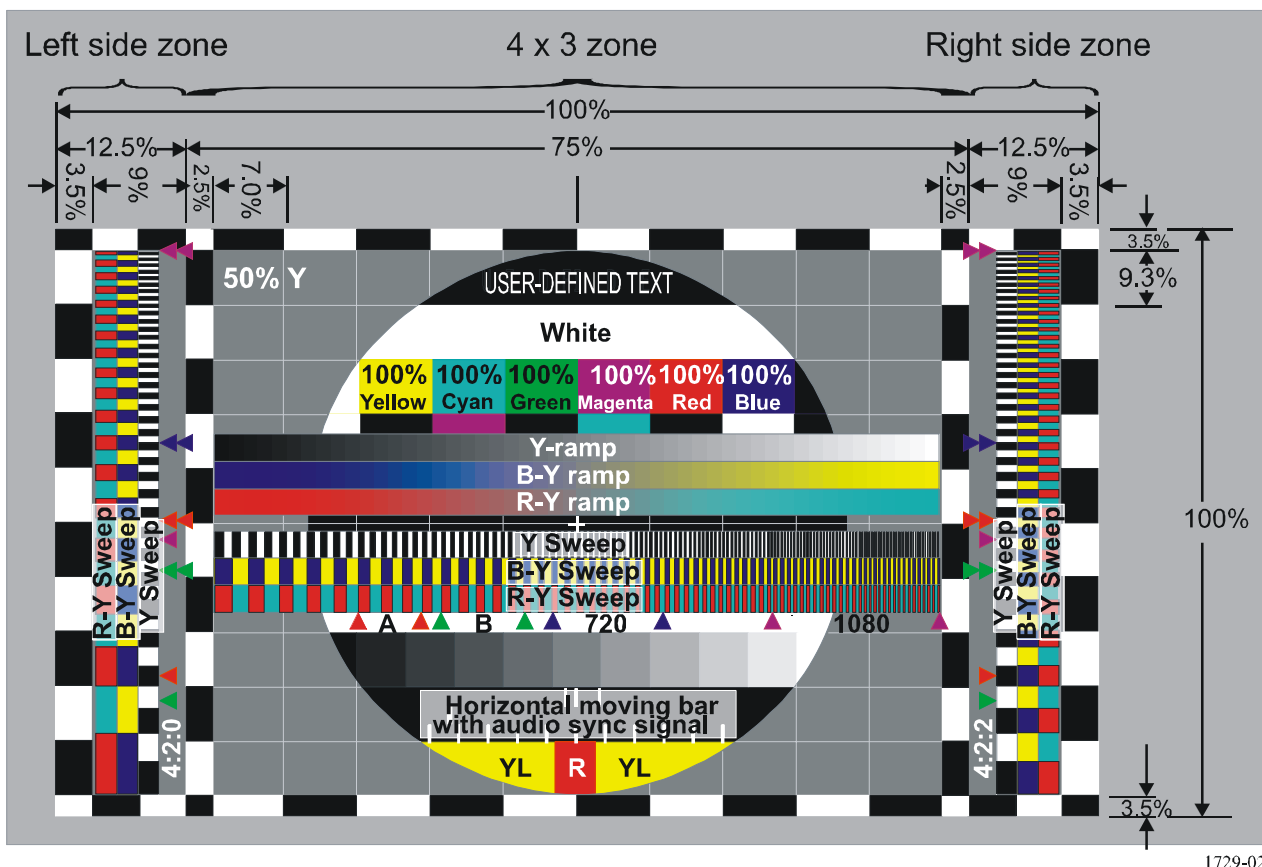
The zones of the multi-format test pattern are shown in Fig. 1. The test pattern is shown in detail with labels in Fig. 2. The test pattern is shown as it appears on screen in Fig. 3. An alternate format suited to 4 × 3 systems is shown in Fig. 4.

FIGURE 1
Zones of the multi-format test pattern



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FIGURE 2
Multi-format test pattern – detail with labels



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FIGURE 3
Multi-format test pattern – as seen on screen

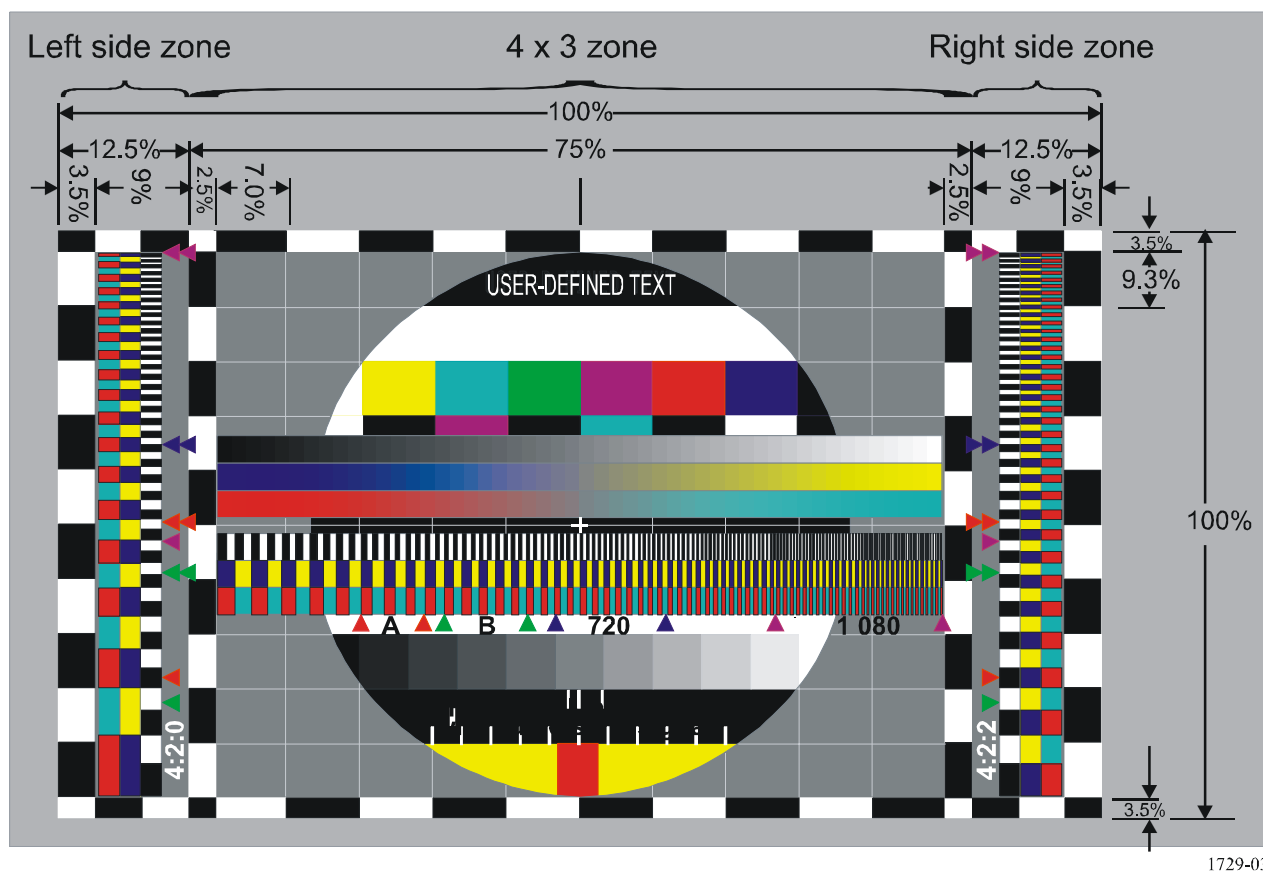
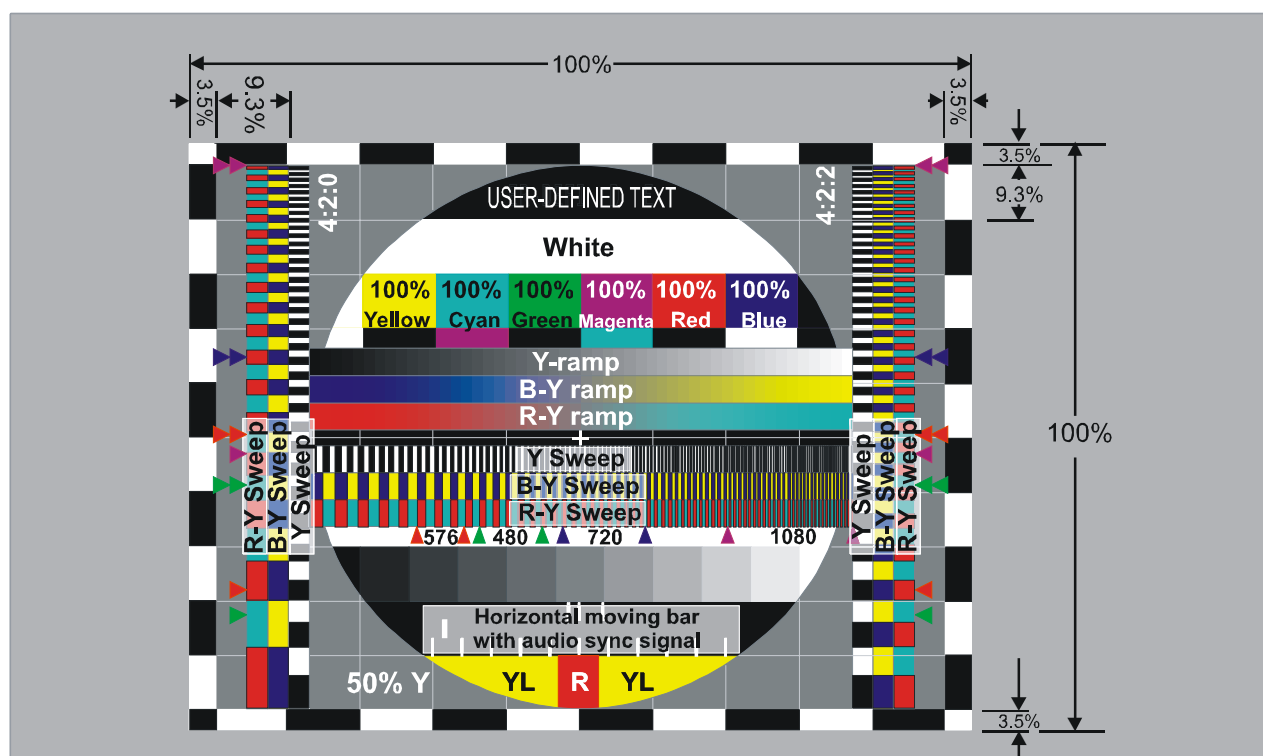


FIGURE 4
Multi-format test pattern – alternate format for 4 × 3 systems



Usage of zones

The overall aspect ratio of the test pattern is 16×9 , comprising a centre zone of 4×3 aspect ratio and two side zones of equal size.

For both the 16×9 zone and the 4×3 zone, the edges are castellated to a thickness of 3.5% of the picture dimension. For the sides of the 4×3 zone, this corresponds to 2.5% of the full width of the pattern. The castellated edges are used to adjust overscan (see Recommendation ITU-R BT.1379). The width of the castellated areas is given in Table 1.

TABLE 1
Castellation thickness (pixels)

Zone		Top, bottom	Sides, 16×9 area ⁽¹⁾	Sides, 4×3 area ⁽¹⁾
Systems				
$1\ 920 \times 1\ 080$	16×9	38	67	48
$1\ 280 \times 720$	16×9	25	45	32
960×576	16×9	20	34	24
960×483	16×9	20	34	24
720×576	16×9	20	25	18
	4×3		n/a	25
720×483	16×9	17	25	18
	4×3		n/a	25

⁽¹⁾ The indicated values are ideal widths. In the case of 4:2:2 implementations, even valued widths are recommended.

NOTE 1 – For a picture width of 720 pixels in 16:9 format, use horizontal resolution markers at position A. For a picture width of 960 pixels in 16:9 format or for a cropped picture of width 720 pixels in 4:3 format, use horizontal resolution markers at position B.

In the centre of the picture is a large circle containing Zones 2-13. This circle indicates the aspect ratio of the source signal. The diameter of the circle is 93% of the picture height. This circle is set against a crosshatched background of 50% grey (Zone 1). Zone 1 is divided into a 10×10 grid.

Zones 8-10, 14 and 15 contain frequency response bars. Associated with these bars are coloured markers to show the end of the pass-band ($0.8 \times$ Nyquist frequency) and the Nyquist frequency of 483-, 576-, 720- and 1 080-line systems. Vertical frequency sweep may be expressed by either frame-based or field-based signals.

Zone 2 is user-definable and is intended for text to identify the transmission channel or signal source.

Zone 3 contains a white bar (100% luminance) as reference for the colour bars immediately below it.

Zones 4 contains a set of 100/0/100/0 colour bars. The colour bars may be used for checking cameras, codecs and monitors in any part of a production chain or they may be used for checking any other equipment used for digital emission and presentation.