



Recommendation ITU-R BT.814-4
(07/2018)

**Specifications of PLUGE test signals and
alignment procedures for setting
of brightness and contrast of displays**

BT Series
Broadcasting service
(television)



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Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

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Series of ITU-R Recommendations

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Series	Title
BO	Satellite delivery
BR	Recording for production, archival and play-out; film for television
BS	Broadcasting service (sound)
BT	Broadcasting service (television)
F	Fixed service
M	Mobile, radiodetermination, amateur and related satellite services
P	Radiowave propagation
RA	Radio astronomy
RS	Remote sensing systems
S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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RECOMMENDATION ITU-R BT.814-4

Specifications of PLUGE* test signals and alignment procedures for setting of brightness and contrast of displays

(1992-1994-2007-2017-2018)

Scope

This Recommendation defines test signals and alignment procedures for the adjustment of displays used for programme production and monitoring. The signal may be used to set displayed image values for standard definition television, high definition television and ultra high definition television including the PQ and HLG high dynamic range television systems.

Keywords

PLUGE, display adjustment, HDR, HDR-TV, brightness, contrast

The ITU Radiocommunication Assembly,

considering

- a) that precision picture monitors are used in a variety of applications including subjective laboratory testing and control room monitoring of operational systems;
- b) that variations in the set-up and adjustment of displays may lead to variations in displayed pictures;
- c) that special signals that assist with the set-up and adjustment of monitors have been developed and have been in operational use for many years,

recommends

- 1 that the PLUGE test signal (see Note 1) described in Annex 1 should be used for setting of displays used for subjective assessments, and for operational monitoring of systems described in Recommendations ITU-R BT.1700¹ and ITU-R BT.601²;

* The term, PLUGE, was originally derived from “Picture Line Up Generating Equipment”.

¹ Recommendation ITU-R BT.1700 – Characteristics of composite video signals for conventional analogue television systems.

² Recommendation ITU-R BT.601 – Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios.

2 that the PLUGE test signal described in Annex 2 should be used for setting of displays used for subjective assessments, and for operational monitoring of systems described in Recommendations ITU-R BT.709³, ITU-R BT.2020⁴ and ITU-R BT.2100⁵;

3 that the procedure to be followed for the use of the PLUGE test signal should be as described in Annex 3,

further recommends

that further studies on methods for black level adjustment of HDR displays be conducted and that informative Annexes 4 and 5 of this Recommendation be updated to reflect improved methods.

Annex 1 (normative)

Specifications of PLUGE signal for SDTV

The PLUGE signal (see Fig. 1) is composed of:

- a) three closely spaced narrow vertical stripes on the left-hand side of the picture. The central vertical stripe is at waveform black level. The left-hand stripe is slightly darker, and the right-hand stripe is slightly lighter than the central stripe;
- b) a broad bar signal located on the right-hand side of the picture. It is divided into four areas, one at white level and the other three at descending grey levels. This grey scale is in approximately equal steps, as seen by eye, over a contrast range of 30:1. The peak white area is sufficiently large to enable the peak luminance to be set by a measuring instrument;
- c) a uniform background surrounding the vertical stripes and the broad bar described above. Two different levels for this background are specified according to the application:
 - for operational monitoring the background level is set to signal black level;
 - for subjective assessments the background level is set to the grey level shown in Table 1. This background level has been optimized to give a picture display of subjective quality similar to that used in sequences used in subjective assessment.

³ Recommendation ITU-R BT.709 – Parameter values for the HDTV standards for production and international programme exchange.

⁴ Recommendation ITU-R BT.2020 – Parameter values for ultra-high definition television systems for production and international programme exchange.

⁵ Recommendation ITU-R BT.2100 – Image parameter values for high dynamic range television for use in production and international programme exchange.