

International Telecommunication Union

ITU-R
Radiocommunication Sector of ITU

Recommendation ITU-R BT.1848-1
(10/2015)

**Safe areas of wide-screen 16:9 aspect
ratio digital productions**

BT Series
Broadcasting service
(television)

150 
1865-2015

 **ITU**
International
Telecommunication
Union

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.

Policy on Intellectual Property Right (IPR)

ITU-R policy on IPR is described in the Common Patent Policy for ITU-T/ITU-R/ISO/IEC referenced in Annex 1 of Resolution ITU-R 1. Forms to be used for the submission of patent statements and licensing declarations by patent holders are available from <http://www.itu.int/ITU-R/go/patents/en> where the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC and the ITU-R patent information database can also be found.

Series of ITU-R Recommendations

(Also available online at <http://www.itu.int/publ/R-REC/en>)

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.

Electronic Publication
Geneva, 2015

© ITU 2015

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without written permission of ITU.

RECOMMENDATION ITU-R BT.1848-1

Safe areas* of wide-screen 16:9 aspect ratio digital productions

(2008-2015)

Scope

This Recommendation provides guidelines on safe areas of 625-line, 720-line, 1 080-line, 2 160-line and 4 320-line formats of wide-screen 16:9 aspect ratio digital productions.

The ITU Radiocommunication Assembly,

considering

- a) that Recommendation ITU-R BT.1379-2 – 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, already exists;
- b) that the use of a 16:9 chain for the transmission of a programme in 4:3 has encouraged the introduction of new 16:9 equipment;
- c) that the ability to use a single master for simultaneous transmission of both digital 16:9 and 4:3 aspect ratio content has encouraged the transition to 16:9 broadcasting;
- d) that the use of component digital 16:9 video chains will provide viewers watching 16:9 services with the optimum picture quality;
- e) that the introduction of wide-screen formats have included 4 320-line, 2 160-line, 1 080-line and 720-line as well as lower resolution;
- f) that digital technology in cameras, distribution, and displays makes it possible to maintain the originally captured format throughout the broadcasting chain;
- g) that display overscan is both unnecessary and undesirable for digital television;
- h) that consumers now watch television programmes on many devices which typically use displays without overscan,

recommends

- 1** that, in the case of programmes intended for 625-line transmission, account should be taken of the guidelines for safe areas described in Annex 1;
- 2** that, in the case of programmes intended for 720-line transmission, account should be taken of the guidelines for safe areas described in Annex 2;
- 3** that, in the case of programmes intended for 1 080-line transmission, account should be taken of the guidelines for safe areas described in Annex 3;

* Safe areas are located within the active image area of television production systems and ensure visibility of critical picture elements of television programmes on the majority of home television receivers. Safe areas are generally defined by safe action area and safe graphics area; safe action area is the maximum image area within which all significant action should be contained, and safe graphics area is the maximum image area within which all significant graphics should be contained.

4 that, in the case of programmes intended for 2 160-line transmission, account should be taken of the guidelines for safe areas described in Annex 4;

5 that, in the case of programmes intended for 4 320-line transmission, account should be taken of the guidelines for safe areas described in Annex 5,

further recommends

1 that manufacturers of consumer television displays should be strongly encouraged to produce displays without overscan in order for the full image as approved by the programme producer to be enjoyed by all consumers;

2 that, where available, the use of a fully component electronic production chain in the 16:9 aspect ratio should be preferred.

Annex 1

Safe areas for television programmes intended for wide-screen 625-line transmission

These guidelines are aimed at those involved in any stage of the programme-making process and at manufacturers of production equipment for programmes intended to be broadcast using 625-line transmission systems.

All the safe areas have been specified on the premise that the overscan on modern domestic television receiver displays will normally be in the range $7.0 \pm 1\%$ of overall picture width or height. But for any one picture edge, the overscan should not exceed 4% of total picture width or height.

Appendix 1 to Annex 1

Safe areas for television programmes made in the 625-line interlaced scan 16:9 wide-screen format: Shoot-to-protect the 16:9 full image

Table 1 shows how the action and graphics areas are defined to protect the full 16:9 wide-screen image.

TABLE 1

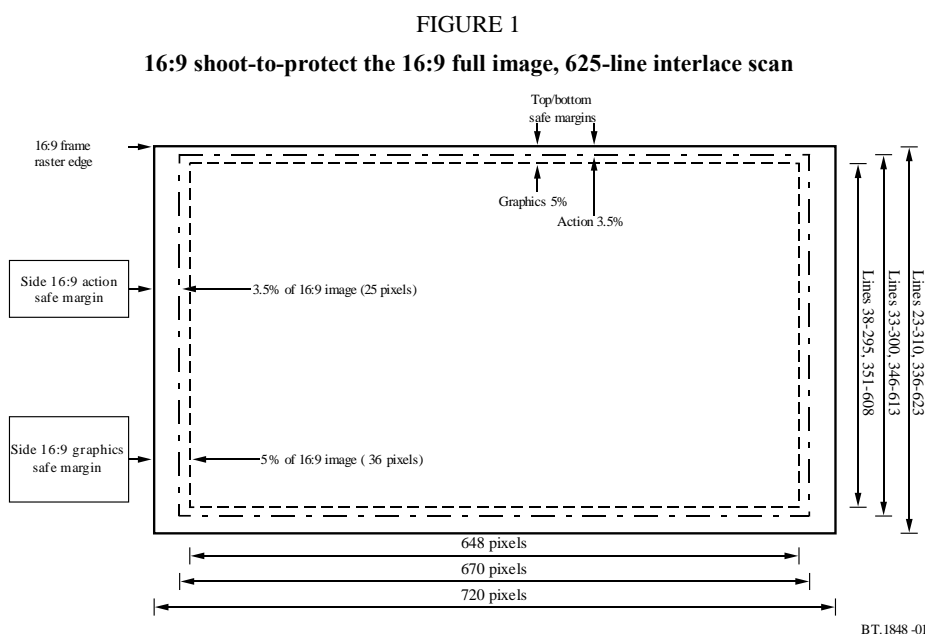
	Vertical	Horizontal
Action safe margin (%) ^{(1), (2)}	3.5	3.5
Graphics safe margin (%) ^{(1), (3)}	5	5

⁽¹⁾ Defined in Recommendation ITU-R BT.1379-2.

⁽²⁾ The action safe margin is 3.5% at the top, bottom and lateral parts of the original image.

⁽³⁾ The graphics safe margin is 5% at the top, bottom and lateral parts of the original image.

Figure 1 shows these areas in more detail.



The definitions of the safe areas are given in numbers of lines and pixels, which are more definitive than the percentages used previously. However, percentages are also included because they are the basis on which comparisons are made. The line numbering has been calculated on the basis that field 1 is paired with the field 2 line below it, and the line from field 1, which is just inside the percentage box, is defined as the edge of active picture.

Thus, the drawings give the first and last lines and the first and last pixels which are inside the safe areas.

Annex 2

Safe areas for television programmes intended for wide-screen 720-line transmission

This guideline is aimed at those involved in any stage of the programme-making process and at manufacturers of production equipment for programmes intended to be broadcast using 720-line transmission systems.

The safe areas have been specified on the premise that the overscan on modern domestic television receiver displays will normally be in the range $7.0 \pm 1\%$ of overall picture width or height. But for any one picture edge, the overscan should not exceed 4% of total picture width or height.

Appendix 1 to Annex 2

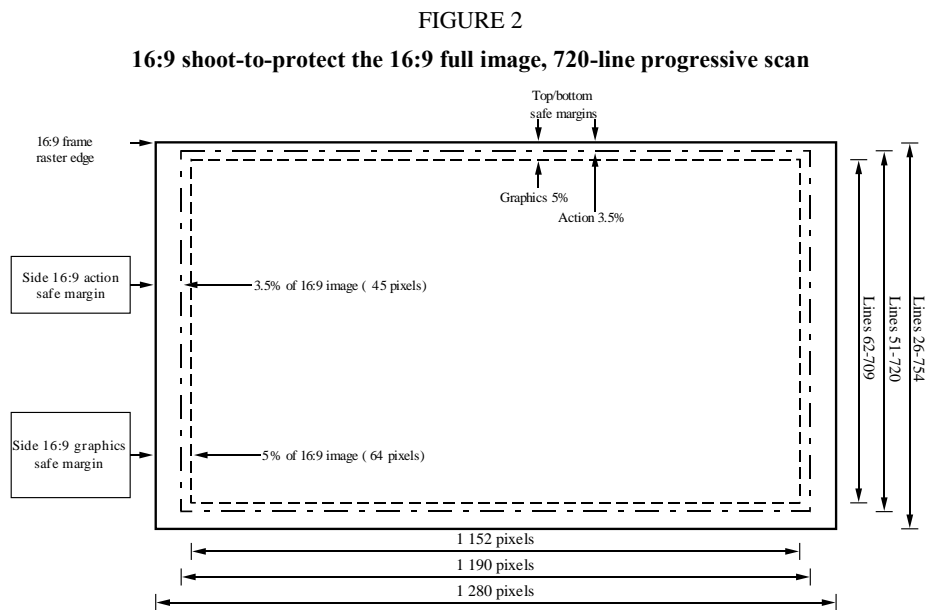
Safe areas for television programmes made in the 720-line progressive scan 16:9 wide-screen format: Shoot-to-protect the 16:9 full image

Table 2 shows how the action and graphics areas are defined to protect the full 16:9 wide-screen image.

TABLE 2

	Vertical	Horizontal
Action safe margin (%)	3.5	3.5
Graphics safe margin (%)	5	5

Figure 2 shows these areas in more detail.



BT.1848-02

The definitions of the safe areas are given in numbers of lines and pixels, which are more definitive than the percentages used previously. However, percentages are also included because they are the basis on which comparisons are made.

Thus, the drawings give the first and last lines and the first and last pixels which are inside the safe areas.

Annex 3

Safe areas for television programmes intended for wide-screen 1 080-line transmission

These guidelines are aimed at those involved in any stage of the programme-making process and at manufacturers of production equipment for programmes intended to be broadcast using 1 080-line transmission systems.

All the safe areas have been specified on the premise that the overscan on modern domestic television receiver displays will normally be in the range $7.0 \pm 1\%$ of overall picture width or height. But for any one picture edge, the overscan should not exceed 4% of total picture width or height.

Appendix 1 to Annex 3

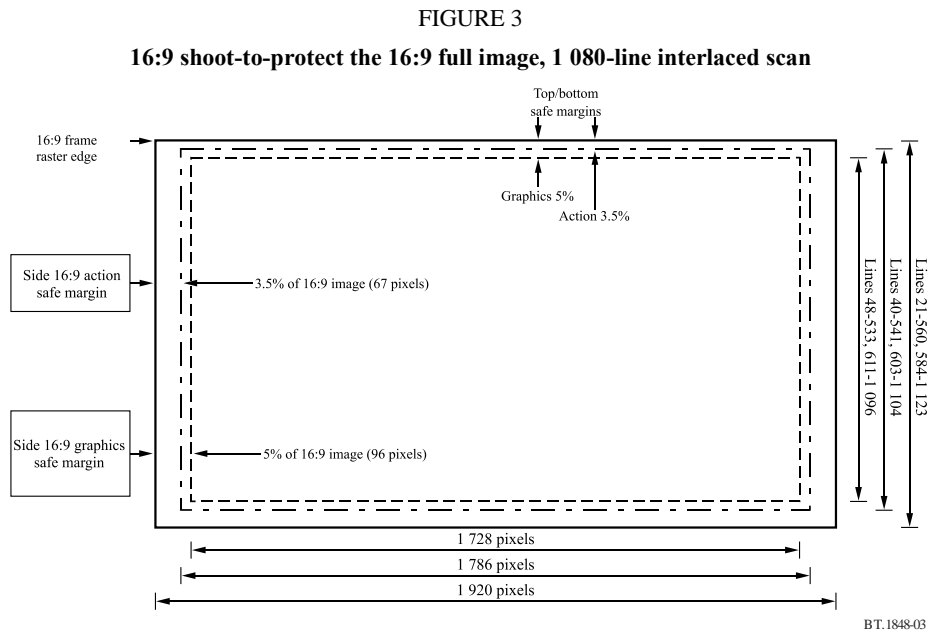
Safe areas for television programmes made in the 1 080-line interlaced scan 16:9 wide-screen format: Shoot-to-protect the 16:9 full image

Table 3 shows how the action and graphics areas are defined to protect the full 16:9 wide-screen image.

TABLE 3

	Vertical	Horizontal
Action safe margin (%)	3.5	3.5
Graphics safe margin (%)	5	5

Figure 3 shows these areas in more detail.



The definitions of the safe areas are given in numbers of lines and pixels, which are more definitive than the percentages used previously. However, percentages are also included because they are the basis on which comparisons are made. The line numbering has been calculated on the basis that field 1 is paired with the field 2 line below it, and the line from field 1, which is just inside the percentage box, is defined as the edge of active picture.

Thus, the drawings give the first and last lines and the first and last pixels which are inside the safe areas.

Appendix 2 to Annex 3

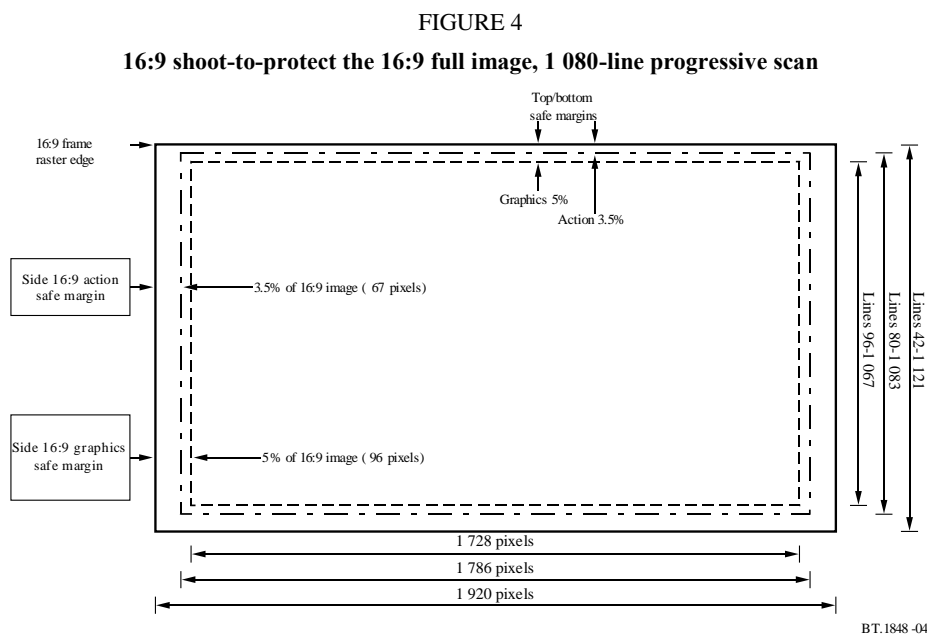
Safe areas for television programmes made in the 1 080-line progressive scan 16:9 wide-screen format: Shoot-to-protect the 16:9 full image

Table 4 shows how the action and graphics areas are defined to protect the full 16:9 wide-screen image.

TABLE 4

	Vertical	Horizontal
Action safe margin (%)	3.5	3.5
Graphics safe margin (%)	5	5

Figure 4 shows these areas in more detail.



The definitions of the safe areas are given in numbers of lines and pixels, which are more definitive than the percentages used previously. However, percentages are also included because they are the basis on which comparisons are made.

Thus, the drawings give the first and last lines and the first and last pixels which are inside the safe areas.

Annex 4

Safe areas for television programmes intended for wide-screen 2 160-line transmission

These guidelines are aimed at those involved in any stage of the programme-making process and at manufacturers of production equipment for programmes intended to be broadcast using 2 160-line transmission systems.

NOTE – Within this Annex, it is recognized that the nomenclature involved some interchangeability between the terms lines and pixels. In Fig. 5 below, pixel counts were applied for both horizontal and vertical dimensions.

Appendix 1 to Annex 4

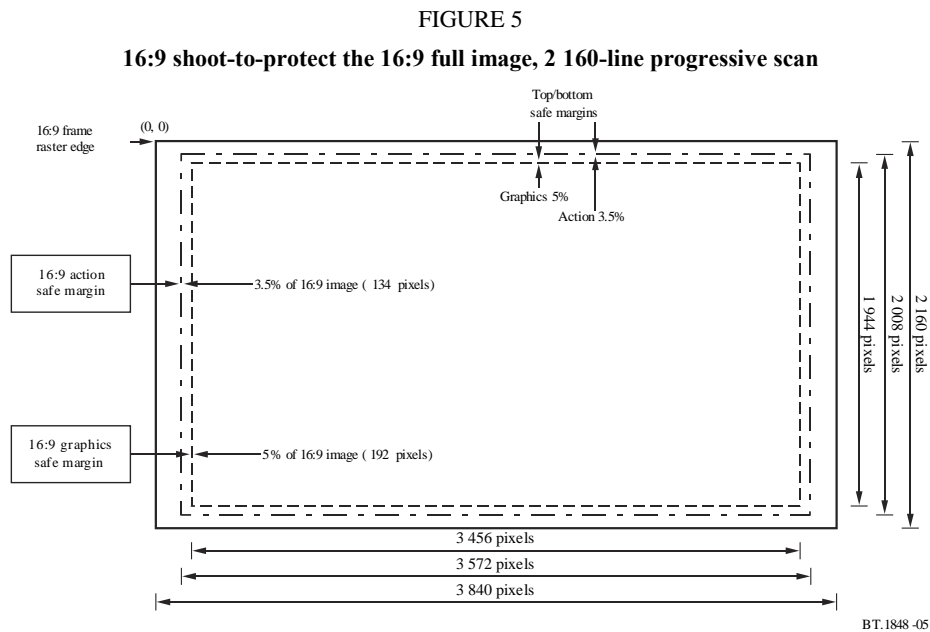
Safe areas for television programmes made in the 2 160-line progressive scan 16:9 wide-screen format: Shoot-to-protect the 16:9 full image

Table 5 shows how the action and graphics areas are defined to protect the full 16:9 wide-screen image.

TABLE 5

	Vertical	Horizontal
Action safe margin (%)	3.5	3.5
Graphics safe margin (%)	5	5

Figure 5 shows these areas in more detail.



The definitions of the safe areas are given in numbers of lines and pixels, which are more definitive than the percentages used previously. However, percentages are also included because they are the basis on which comparisons are made.

Thus, the drawings give the first and last lines and the first and last pixels which are inside the safe areas.

Annex 5

Safe areas for television programmes intended for wide-screen 4 320-line transmission

These guidelines are aimed at those involved in any stage of the programme-making process and at manufacturers of production equipment for programmes intended to be broadcast using 4 320-line transmission systems.

NOTE – Within this Annex, it is recognized that the nomenclature involved some interchangeability between the terms lines and pixels. In Fig. 6 below, pixel counts were applied for both horizontal and vertical dimensions.

Appendix 1 to Annex 5

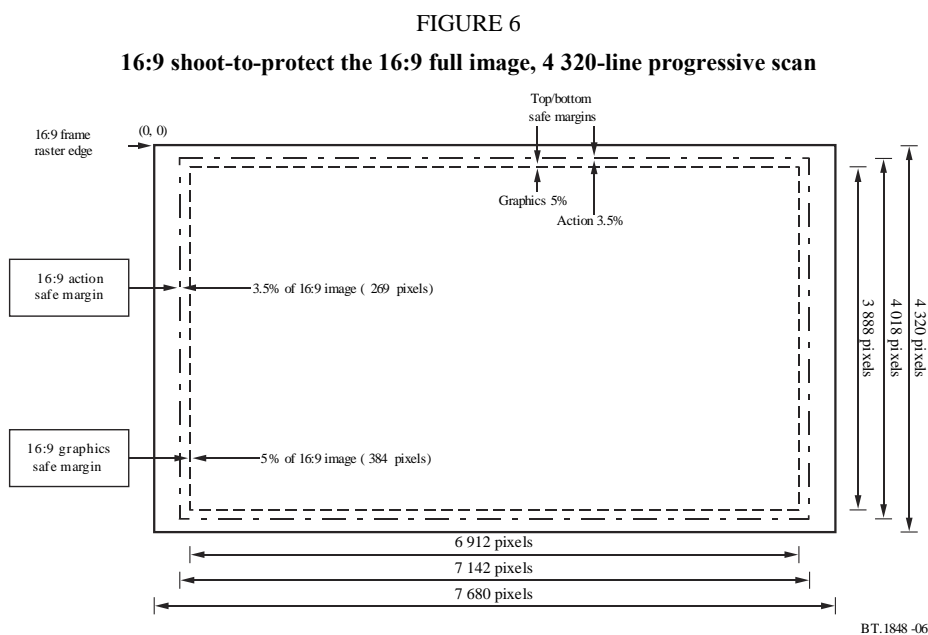
Safe areas for television programmes made in the 4 320-line progressive scan 16:9 wide-screen format: Shoot-to-protect the 16:9 full image

Table 6 shows how the action and graphics areas are defined to protect the full 16:9 wide-screen image.

TABLE 6

	Vertical	Horizontal
Action safe margin (%)	3.5	3.5
Graphics safe margin (%)	5	5

Figure 6 shows these areas in more detail.



The definitions of the safe areas are given in numbers of lines and pixels, which are more definitive than the percentages used previously. However, percentages are also included because they are the basis on which comparisons are made.

Thus, the drawings give the first and last lines and the first and last pixels which are inside the safe areas.