RECOMMENDATION ITU-R BT.417-5*

Minimum field strengths for which protection may be sought in planning an analogue terrestrial television service

(1963-1966-1970-1986-1992-2002)

The ITU Radiocommunication Assembly,

recommends

1 that when planning a television service in Bands I, III, IV or V, the median field strength for which protection against interference is planned should not be lower than:

TABLE 1

Band	I	III	IV	V
dB(μV/m)	+48	+55	+65(1)	+70(1)

(1) The values shown for Bands IV and V should be increased by 2 dB for system K.

These values refer to the field strength at a height of 10 m above ground level;

2 that the percentage of time for which the protection may be sought should lie between 90% and 99%.

NOTE 1 – In arriving at the figures shown in *recommends* 1, it has been assumed that, in the absence of interference from other television transmissions and man-made noise, the minimum field strengths at the receiving antenna that will give a satisfactory grade of picture, taking into consideration receiver noise, cosmic noise, antenna gain and feeder loss, are: +47 dB(μV/m) in Band I, +53 dB in Band III, +62 dB** in Band IV (value for the centre frequency of the first channel in Band IV, around 474 MHz) and +67 dB** in Band V (value for channel with the centre frequency, around 842 MHz). For other channels in Bands IV and V, for systems using 8 MHz*** channel raster, the minimum field strength value should be derived as follows:

$$E_{min}\ (\mathrm{dB}(\mu\mathrm{V/m})) = 62 + 20 \log (f/474)$$

with f being the channel centre frequency expressed in MHz. These values may be used to derive the noise-limited sensitivity of receivers as shown in Recommendation ITU-R BT.804.

NOTE 2 – Further information concerning the planning of television services is contained in Annex 1.

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* Radiocommunication Study Group 6 made editorial amendments to this Recommendation in 2002 in accordance with Resolution ITU-R 44.

** The values shown for Bands IV and V should be increased by 2 dB for system K.

*** The formula for other channel raster is still under study.

NOTE 3 – In a practical plan, because of interference from other television transmissions, the field strengths that can be protected will generally be higher than those quoted in *recommends* 1, and the exact values to be used in the boundary areas between any two countries should be agreed between the administrations concerned.

NOTE 4 – The broadcasting band designations I, III, IV and V derive from the European VHF/UHF Broadcasting Conference, Stockholm, 1961 and the African VHF/UHF Broadcasting Conference, Geneva, 1963. The frequency ranges at that time were:

Band I	41-68 MHz
Band III	162-230 MHz
Band IV	470-582 MHz
Band V	582-960 MHz

According to the Radio Regulations the bands allocated to the broadcasting service start at 47 MHz (Band I) and 174 MHz (Band III) respectively.

ANNEX 1

Boundaries of the television service in rural districts having a low population density

Where television services are to be provided for a sparsely populated region, in which better receivers and antenna installations are likely to be employed, administrations may find it desirable to establish the appropriate median field strength for which protection against interference is planned as shown in Table 2.

TABLE 2

Band	I	III	IV	V
dB(μV/m)	+46	+49	+58	+64

These values refer to the field strength at a height of 10 m above ground level.

In the absence of interference other than noise, field strengths of the order of 40 dB(μV/m) in Band I, 43 dB(μV/m) in Band III, 52 dB(μV/m) in Band IV and 58 dB(μV/m) in Band V can give satisfactory pictures. However, it is generally observed that the public begin to lose interest in installing television reception equipment when the field strength falls much below these levels.

The values given above have been obtained from field-strength investigations at the edge of the coverage area and picture quality assessments for Bands I and III in rural districts of Australia, India and Italy for Bands IV and V at both rural and urban locations in Italy and the United Kingdom. Therefore it is not appropriate to provide a minimum field strength calculation formula as was done in Note 1. It may be noted that in Bands IV and V where man-made noise is not generally a problem, the field-strength values quoted for rural areas may also be applied in urban areas.