

RECOMMENDATION ITU-R BS.638*,**

**Terms and definitions used in frequency planning
for sound broadcasting**

(1986)

The ITU Radiocommunication Assembly,

recommends

that for the purpose of frequency planning for sound and television broadcasting, the following terms and definitions should be used:

1 Signal-to-interference ratios

1.1 The *audio-frequency (AF) signal-to-interference ratio* is the ratio (expressed in dB) between the values of the voltage of the wanted signal and the voltage of the interference, measured under specified conditions, at the audio-frequency output of the receiver.

This ratio corresponds closely to the difference in volume of sound (expressed in dB) between the wanted programme and the interference.

1.2 The *audio-frequency (AF) protection ratio* is the agreed minimum value of the audio-frequency signal-to-interference ratio considered necessary to achieve a subjectively defined reception quality.

This ratio may have different values according to the type of service desired.

1.3 The *radio-frequency (RF) wanted-to-interfering signal ratio* is the ratio (expressed in dB) between the values of the radio-frequency voltage of the wanted signal and the interfering signal, measured at the input of the receiver under specified conditions.

1.4 The *radio-frequency (RF) protection ratio* is the value of the radio-frequency wanted-to-interfering signal ratio that enables, under specified conditions, the audio-frequency protection ratio to be obtained at the output of a receiver.

The specified conditions include such diverse parameters as: spacing Δf of the wanted and interfering carrier, carrier offset, carrier-frequency tolerance, modulation characteristics (type of modulation, modulation depth, pre-emphasis characteristics, frequency deviation, etc.), characteristics of the AF signal (bandwidth, dynamic compression), receiver input level as well as the receiver characteristics (selectivity and susceptibility to cross-modulation, etc.).

* This Recommendation should be brought to the attention of the CCV.

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

2 Specific field strengths

2.1 Minimum usable field strength (E_{min})

Minimum value of the field strength necessary to permit a desired reception quality, under specified receiving conditions, in the presence of natural and man-made noise (see Recommendation ITU-R P.372), but in the absence of interference from other transmitters.

NOTE 1 – The desired quality is determined in particular by the protection ratio against noise, and for fluctuating noise, by the percentage of time during which this protection ratio must be ensured.

NOTE 2 – The receiving conditions include, amongst others:

- the type of transmission, and frequency band used;
- the receiving equipment characteristics (antenna gain, receiver characteristics, siting);
- receiver operating conditions, particularly the geographical zone, the time and the season.

NOTE 3 – Where there is no ambiguity, the term “minimum field strength” may be used.

NOTE 4 – The term “minimum usable field strength” corresponds to the term “minimum field strength to be protected” which appears in many ITU texts.

2.2 Usable field strength (E_u)

Minimum value of the field strength necessary to permit a desired reception quality, under specified receiving conditions, in the presence of natural and man-made noise and interference, either in an existing situation or as determined by agreements or frequency plans.

NOTE 1 – The desired quality is determined in particular by the protection ratios against noise and interference and, in the case of fluctuating noise or interference, by the percentage of time during which the required quality must be ensured.

NOTE 2 – The receiving conditions include, amongst others:

- the type of transmission and frequency band used;
- the receiving equipment characteristics (antenna gain, receiver characteristics, siting);
- receiver operating conditions, particularly the geographical zone, the time and the season, or if the receiver is mobile, the local variations of the field strength due to propagation effects.

NOTE 3 – The term “usable field strength” corresponds to the term “necessary field strength” which appears in many ITU texts. Use of the latter term is not desirable.

NOTE 4 – For the determination of the usable field strength see Report ITU-R BS.945 for information.

2.3 Reference usable field strength (E_{ref})

The agreed value of the usable field strength that can serve as a reference or basis for frequency planning.

NOTE 1 – Depending on the receiving conditions and the quality required, there may be several reference usable field-strength values for the same service.

NOTE 2 – Where there is no ambiguity, the term “reference field strength” may be used.

NOTE 3 – The term “reference usable field strength” corresponds to the term “nominal usable field strength” which appears in some ITU texts.

3 Coverage area (of a broadcasting transmitter in a given broadcasting band)

The area within which the field strength of a transmitter is equal to or greater than the usable field strength.

In the case of fluctuating interference or noise, the percentage of time during which this condition is satisfied should be stated.

The coverage area may be different under day-time and night-time conditions (bands 5, 6 and 7) or vary with other factors.

NOTE 1 – The coverage area is determined solely by the technical conditions specified, irrespective of administrative or regulatory considerations.

NOTE 2 – See also Recommendation ITU-R V.573.
