



Bundesnetzagentur

Man-made noise: One component of radio noise

Ralf Trautmann

LS summitt

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- Definition according to Rec. ITU-R P.372:
A time-varying electromagnetic phenomenon having components in the radio-frequency range, apparently not conveying information and which may be superimposed on, or combined with, a wanted signal.

Component	Possible dominant frequency range
Atmospheric noise due to lightning	10 kHz – 30 MHz
Radiation from celestial sources	4 MHz – 100 MHz
Man-made noise	10 kHz -1 GHz
Emission from atmospheric gases	> 10 GHz

- The expected average noise levels of Rec. ITU-R P.372 are based on measurements in the 1970s in the United States which are not traceable anymore.
- The German Bundesnetzagentur (BNetzA) performed from 2007 until 2010 comprehensive measurements up to 1 GHz in city, residential, rural and quiet rural areas.
- The measurement results between 12 MHz and 30 MHz are generally lower than expected according to ITU-R P.372.
- Only in rural areas were the results in the shortwave range above the values of ITU-R P.372.

- The white Gaussian noise levels of the man-made noise being lower than the values in the ITU-R P.372 demonstrate that measures taken to reduce EMC radiation predominate the effects of the enormous increase of number of potential sources of interference.
- However, the measurements showed also high pulse peaks which are not considered when measuring white noise levels.
- There is no internationally agreed method to quantify the interference potential of pulse interferers.
- There are no indications for an increasing radiation of cable TV networks.

- In the 1970s the predominant sources of man-made noise were electrical machines and ignition sparks from vehicles.
- Today, man-made noise is predominantly produced by computers, monitors, switching power supplies and powerline modems. In particular the power conversion stages of LED lighting systems coupled with the huge number of light fittings must be noted.
- Due to size constraints, some manufacturers of electronic devices are dropping the necessary filter components.

- The market is flooded with cheap, non-branded LED lamps which do not comply the essential requirements of the EMC directive.
- In 2017 electronic equipment representing a value of 49 billion Euros were imported from China to Germany.



Source: Interference to DAB reception ITU Workshop Measurements and tests in Norway

- RESOLUTION ITU-R 46
 - ... resolves to request administrations
 - 1 to consider the compatibility between telecommunication systems, particularly between wire or cable systems and radio systems;
 - 2 to carry out studies and submit their results to ITU.
- QUESTION ITU-R 218/1*
 - What techniques are appropriate for the measurement of radiation from telecommunication systems utilising electricity power supply or telephone distribution wiring radiation sources?

- Recommendation ITU-R SM.1753 Methods for measurements of radio noise
- The noise levels mentioned in Recommendation ITU-R P.372 will be increased in the short wave range. The increase is based on numerous measurements of different administrations which were collected in an ITU data base.



Ralf Trautmann

+49 6131 18 5419

ralf.trautmann@bnetza.de