NoiseReporter v1.0

(c) Thilo Kootz, DL9KCE

Instructions by Ulfried Ueberschar, DJ6AN

Introduction

Who wishes to help sustainably stop the decay of the electromagnetic environment, must first consider how the level of electromagnetic interference in relation to the expected level is. This is relatively simple using *NoiseReporter*.

ITU-R P.372-12 as a basis for intended radio reception

Essential Requirements as laid out in the EU directive for the immunity of equipment [1] need a measurable reference. Among the ITU Member States for that purpose the ITU-R P.372-12 is known to quantify *man made noise*, which is to be expected in a given environment. [2]

In particular, the immunity tests in harmonized standards presume with their severities a given electromagnetic environment, which refer to the ITU-R P.372-12 as reference.

ITU-R P.372-12 as a basis for minimum field strength for broadcast reception

As minimum field strength requirement for receiving broadcasting services, ITU-R P.372-12 calls the expected ground level of electromagnetic interference for the recommendations ITU-R BS.412-8, BS.560-3, BT.655-4 and IS. 851-1 as the protection ratio (RF)) [3] required for maintaining the desired reception quality of radio communications.

To demand a minimum field strength requirement that is not in accordance with ITU-R P.372-12 man made noise to be expected as a condition, both for the normal operation of a broadcast radio, as well as for an amateur radio service [3] receiver.

The *NoiseReporter*

Thilo Kootz, DL9KCE, published a program *NoiseReporter* which can be used to describe the electromagnetic environment with respect to ITU-Rec. P.372-12 (issued July 2015). It displays the current field strength of the electromagnetic noise received in a horizontally suspended lambda / 2 antenna for amateur bands below 300 MHz.

There must not be any wanted RF signals within the measurement bandwidth during the measurement.

The advantage of *Noise reporter* in comparison to "EXCEL Table to ITU-R P.372" programmed by Ulfried Ueberschar, DJ6AN, and presented in 2015 is visible the most *NoiseReporter* is interactive. The level diagram E (f) shows actually present local noise and the expected values in the same graphic.

The application

All you need is a receiver with a calibrated S-meter and known measurement bandwidth. If the measurement antenna deviates from lambda / 2 dipole, the respective deviating from 2.15 dBi gain in Gain [dBi] field must be entered.

In the diagram E (f), "Exp. Man Made Noise ITU-R P.372-12", are the expected mean values of electromagnetic noise (*man-made noise*) for environments City to Quiet Rural and the level line for galactic noise above 10 MHz adopted as parameters from the ITU-R

P.372-12.

Depending on the receiver and you prefrences, data can be input in the program by selection of: S-meter display, antenna voltage (dBµV), antenna power (dBm) or in field strength dB(µV/m).

After pressing *ENTER - input Add Measurement* frequency and resulting field strength are stored as USER data and display by a black dot in the diagram E (f).

The Shift +/- moves the diagram along the axes E(f), while Width +/- spreads or shrinks the axes. When zooming very much, more lines become visible to allow better reading of possible values.

The frequency axis is divided logarithmically. Furthermore all center frequencies of the amateur radio bands are highlighted.

The two most used measurement bandwidths 2700 Hz and 9000 Hz can be changed to other values if it is necessary.

With *ENTER - input Add Measurement* entering the measured values is completed.

In the field *USER Data* the frequencies and the associated field strengths are present. These refer to the electromagnetic interference at the receiving dipole in dB(µV/m).

By comparison with the expected field strengths mean values of the four depicted electromagnetic environments City to Quiet Rural it will show whether the local electromagnetic environment for properly fit for radio reception as expected.

Right click on the User Data field opens the possibility for the following actions:
Delete Item
Load User Data
Save User Data
Clear User Data

Save User Data is useful for applying a stored data collection, for example, to prepare an interference case.

The Print button on the top left of the screen, opens a menu for more detailed view and print the chart E (f).

Sources:
[1] Quotation from EMC-Directive 2014/30/EU: "Equipment shall be so designed and manufactured, having regard to the state of the art, as to ensure that: ....(b) it has a level of immunity to the electromagnetic disturbance to be expected in its intended use which allows it to operate without unacceptable degradation of its intended use.

[2] Recommendation ITU-R P.372-12 (07/2015) Radio noise

[3] Radio-Regulations, Article 1
"1.170   protection ratio (R.F.): The minimum value of the wanted-to-unwanted signal ratio, usually expressed in decibels, at the receiver input, determined under specified conditions such that a specified reception quality of the wanted signal is achieved at the

receiver output.

15.12   § 8 Administrations shall take all practicable and necessary steps to ensure that the operation of electrical apparatus or installations of any kind, including power and telecommunication distribution networks, but excluding equipment used for industrial, scientific and medical applications, does not cause harmful interference to a radiocommunication service and, in particular, to a radionavigation or any other safety service operating in accordance with the provisions of these Regulations.

[4] ITU Radio Regulations (Radio Regulations, article 25)
Quote: "25.8 § 5 1) All pertinent Articles and provisions of the Constitution, the Convention and of synthesis Regulations shall apply to amateur stations (WRC-03)."