AIMS

Man Made Noise Measurement

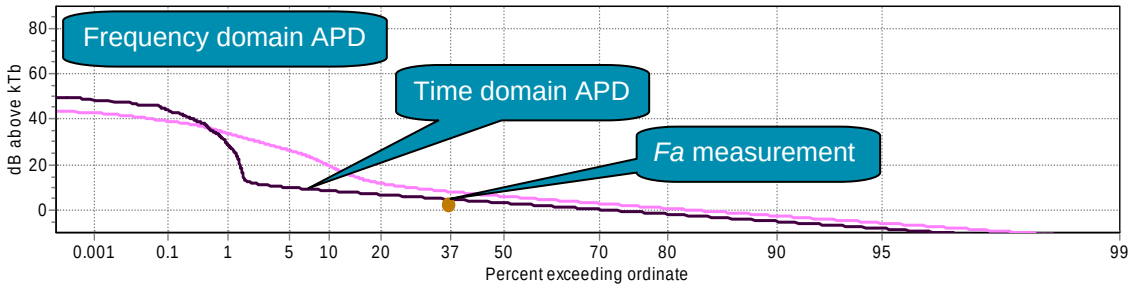
The background noise level of the electromagnetic spectrum in the 40 MHz to 3 GHz region is dominated by Man-Made Noise (MMN) produced by a wide variety of equipment. Electric motors, car ignition systems, neon lights and many other devices produce RF energy as part of their normal mode of operation. Measuring the level of MMN activity provides useful information to receiver designers, researchers and those concerned with managing the RF spectrum.

MMN is characterised in terms of White Gaussian Noise (WGN) and Impulsive Noise (IN) levels. The distinction arises because of the significant differences in the way these two types of phenomena are perceived by a receiver.

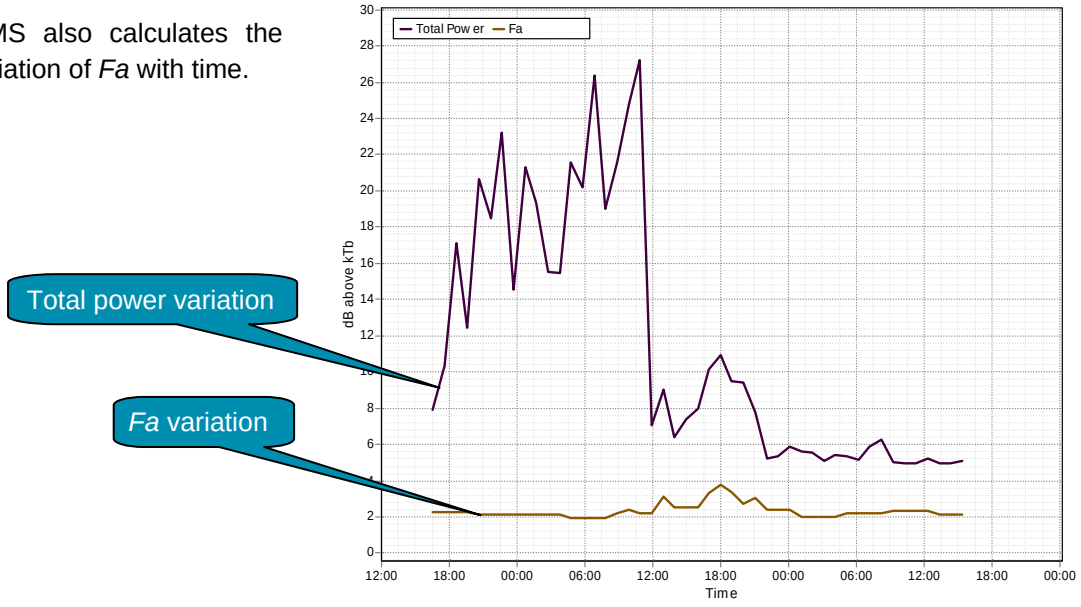
White Gaussian Noise (WGN)

The level of WGN is given by its power level at different frequencies and is represented as a normalised quantity called the external noise factor, *Fa*.

Fa is defined as the minimum level of noise that can be represented as a white Gaussian probability density function in the observed environment. This is calculated in AIMS by fitting Amplitude Probability Distributions (APDs) in both time and frequency domains, fitting a Rayleigh distribution to each of the APDs and taking *Fa* as the lower of the two 37% points. This process helps to remove non-Gaussian noise sources. This WGN algorithm, developed by MASS for the AIMS, has been submitted to the ITU-R to be incorporated as a standard method for calculating *Fa*.



AIMS also calculates the variation of *Fa* with time.



Case Study

Both the UK and Germany are currently conducting *Fa* measurements for submission to the ITU-R to update P.372 on Radio Noise. In December 2006, measurements from the two systems were compared. Despite significant differences in hardware and measurement techniques, the two systems were shown to produce equivalent results, thus providing a high level of confidence that both measurement systems perform the right

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MASS (Head Office)
Grove House
Rampley Lane
Little Paxton St Neots
Cambridgeshire PE19 6EL
United Kingdom

Tel: +44 (0)1480 222600
Fax: +44 (0)1480 407366

MASS (Lincoln Office)
1 Alumina Court
Tritton Road
Lincoln
Lincolnshire LN6 7QY
United Kingdom

Tel: +44 (0)1522 502050
Fax: +44 (0)1522 690250

E-mail: systems@mass.co.uk
Web Site: www.mass.co.uk

A Cohort plc Company

Impulsive Noise (IN)

AIMS records IN data and characterises it in a number of ways: