Effects of Pulsed RF Disturbances on Aeronautical Communication Systems
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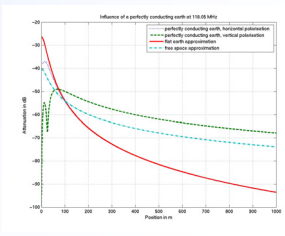
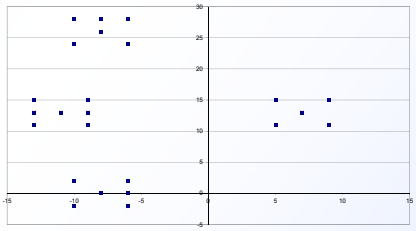
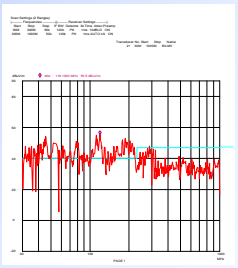
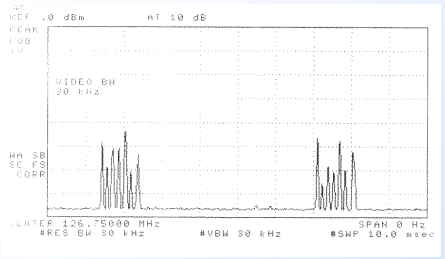
- Introduction
  - Purpose: finding the effect of disturbances on aeronautical communication systems
  - Method used: UTD simulations + measurements
  - Discussion of possible remediations
- Description of the system
  - Antenna towers (4) : 20 m high containing dipole (arrays) for civilian communications (118-137 MHz) or cone antennas for military communications (225-400 MHz)



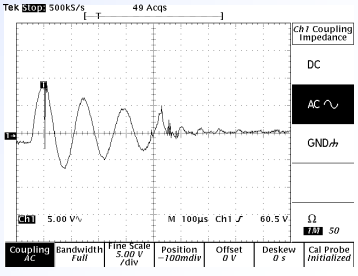



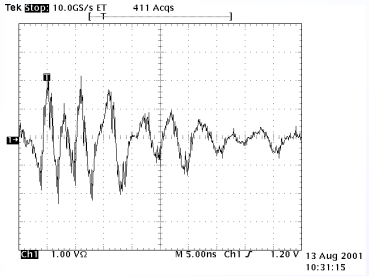
- Road passing by at 275 m, new road planned at 65 m (installed in the meantime; Google earth picture). Simulations

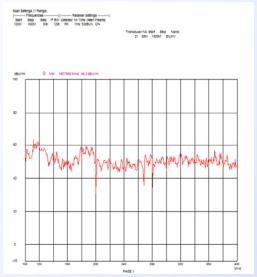
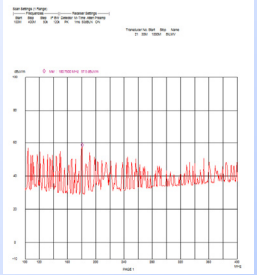


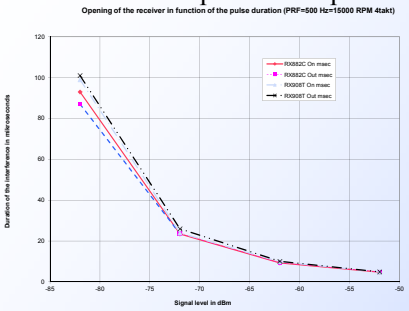
- Measurements: first a continuous burst from a heating system is generated, having nearly no effect. A pulsed system from a spark plug of a car Pulsed system is different: A series of short consecutive pulses is noticed. They are due to the oscillations over the ignition coil. Some receivers were disturbed at 110 m. Detailed time domain spark shape looks strange.

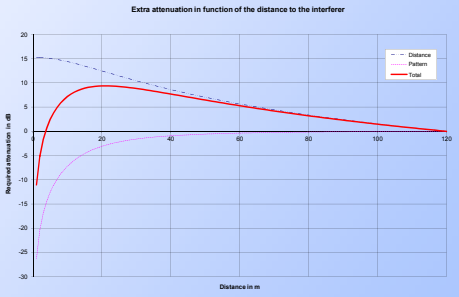




- Horizontal polarisation was the worst, oscillations due to low PRF at 400 RPM.
  A calibrated CW interference is provided: effect is dependent on product of time and signal strength (integration)



- Conclusions
  - Two possible solutions: reducing the sensitivity of the receiver (easiest one)
  - Using a small oblique shield (24°) of 1.36 m. 1.66 would even shield from all below the tower
  - Acknowledgements: direction and personnel of Belgocontrol