

RTCA Special Committee 186, Working Group 5

ADS-B UAT MOPS

Meeting #4

Generation of JTIDS Interference

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SUMMARY



Generation of JTIDS Interference

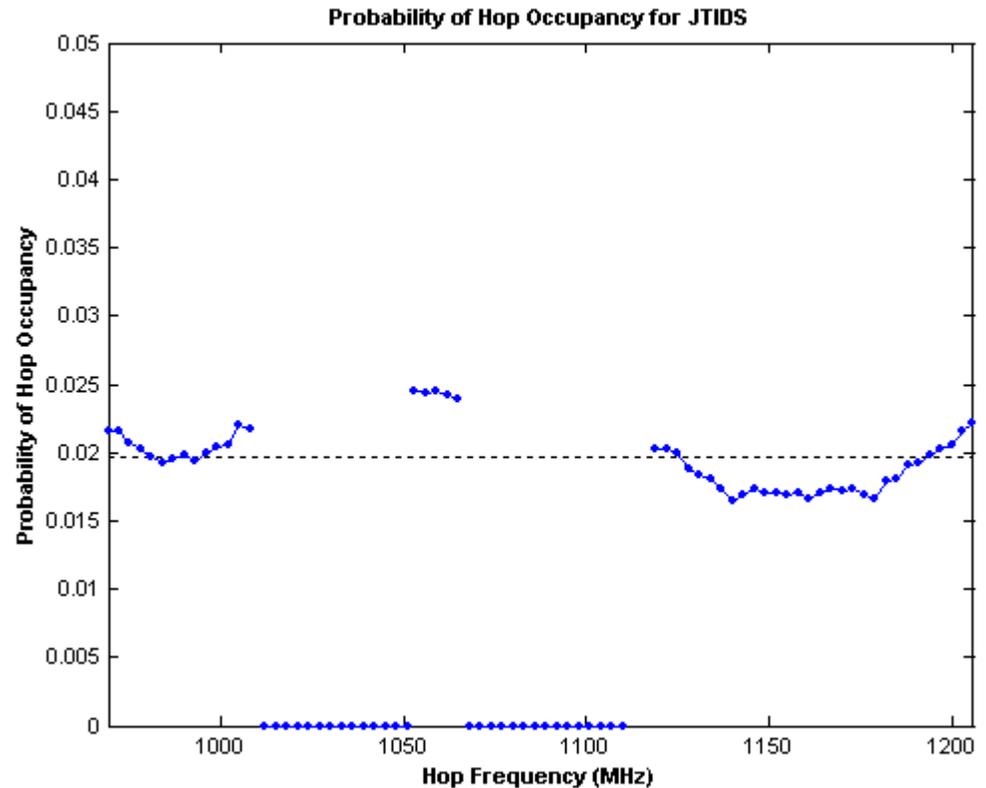
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UAT MOPS Working Group



Probability of Hop Occupancy for JTIDS

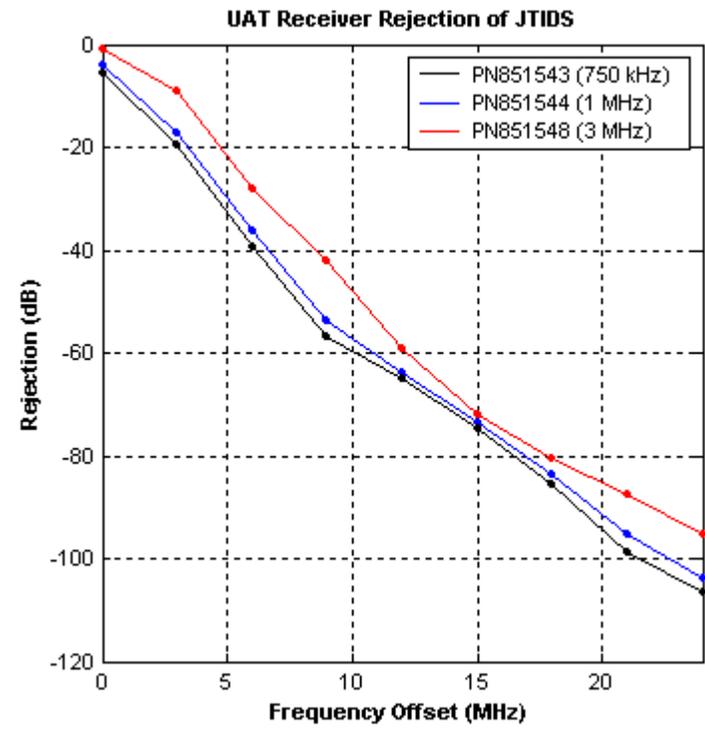
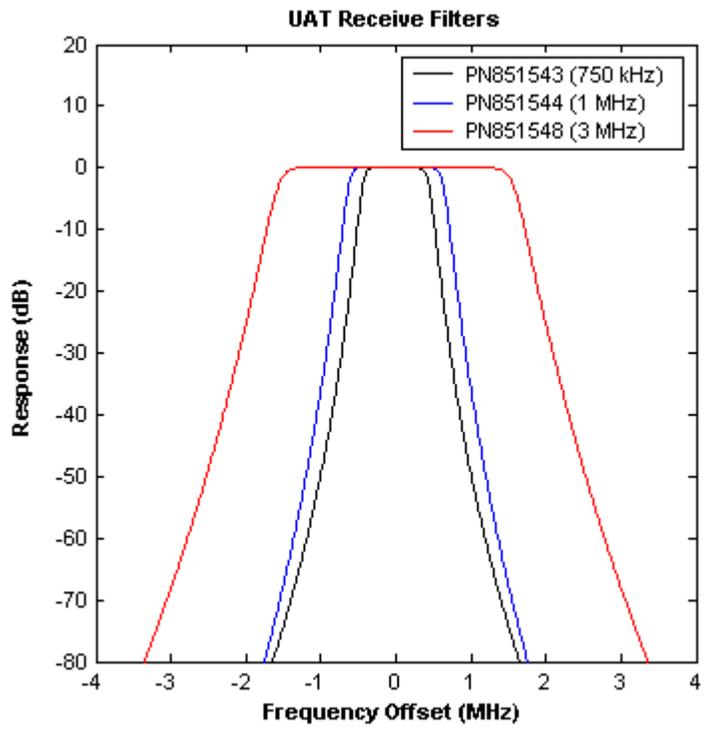
- Randomly generated a hopping frequency from a uniform distribution of all available hops who are at least 30 MHz away from previous hop.
- Non-uniformity of hop occupancy PDF is due to 30-MHz hopping rule and “breaks” at 1030 and 1090 MHz.
- Is this correct hopping algorithm?





UAT Receive Filters

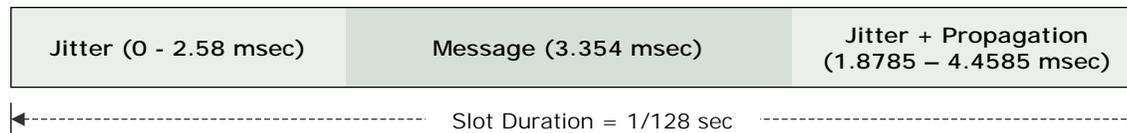
- UAT filter assumed to be Butterworth with parameters to match response to Sawtek data sheets
- JTIDS transmit spectrum is defined as in [UAT-WP-2-03, W. Wilson, M. Leiter]





JTIDS Interference Scenario

- Scenario is defined in [UAT-WP-3-08, R. Weathers and UAT-WP-4-04, M. Biggs, R. Weathers]
 - Scenario One (Uncoordinated Operations Baseline, Option A):
 - 50% TSDF at -60 dBm (5.9 nmi)
 - 300% TSDF at -84.5 dBm (100 nmi)
 - 50% TSDF at -50 dBm (1.8 nmi - 3 nmi)
 - Effective Radiated Power (ERP) of all transmitters is 200 W (e.g., Class-2 JTIDS Terminal)
- Assumed JTIDS time slot structure to be Standard Double Pulses (STD-DP)



- Average number of interference bursts (above -114 dBm) per second assuming probability of hop occupancy is equally likely (1/51)

$$N \approx 14.9 \text{ kilohops / sec}$$



Sample Realization

- Received interference power levels are later adjusted by antenna pattern in model
- UAT Frequency is 978 MHz
- Average number of JTIDS hops per second is 15.1 kilohops /sec.
 - 1.4 % higher than predicted value due to non-uniformity of hop occupancy PDF

