

Optimizing Spectrum Use in the 960–1215 MHz Band

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FAA/MOIE

The logo for the MITRE Technology Program, featuring a stylized graphic of stacked blocks in yellow and orange to the left of the text.

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Problem

- **The FAA, DOD, and commercial users have plans to place future radio-frequency (RF) systems in the already-congested 960–1215 MHz band.**
- **Potential RF interference (RFI) problems among the systems are steadily growing in complexity and likely severity.**
- **An automated tool suite is needed for analysis and prevention of these potential problems.**

Background

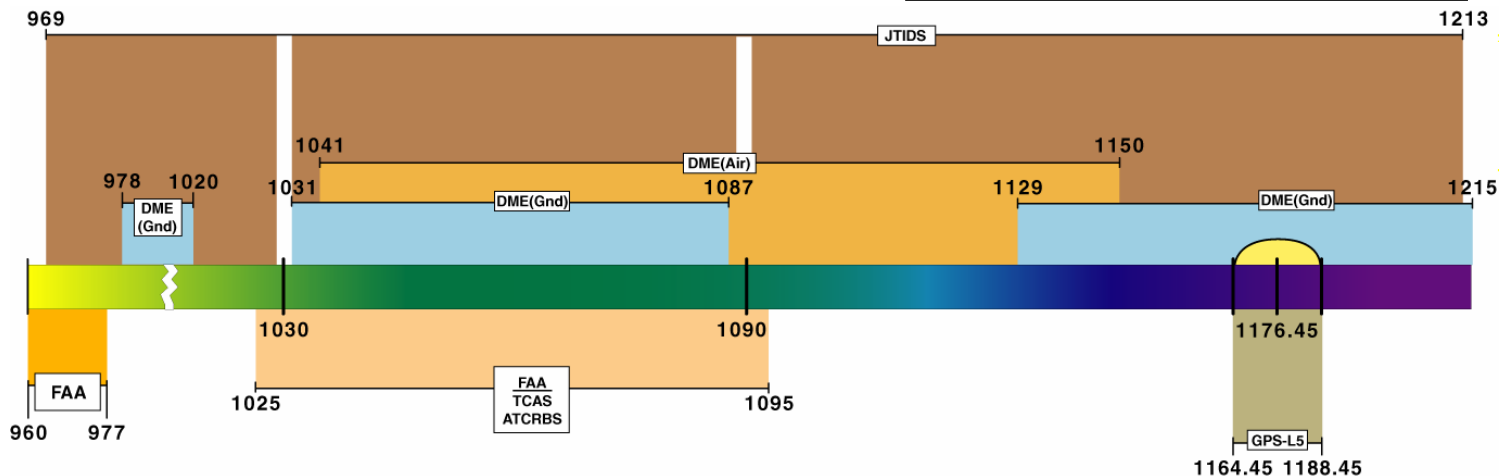
Mutual RF interference is a potential problem among current and future users of 960 - 1215 MHz band

Current & Future Users

- Distance Measuring Equipment (DME)
- Global Positioning System (GPS) L5
- Joint Tactical Information Distribution System (JTIDS)
- Multifunctional Information Distribution System (MIDS)
- Mode A/S
- Tactical Air Navigation (TACAN)
- Traffic Alert and Collision Avoidance System (TCAS)
- Universal Access Transceiver (UAT)

Potential Interference Scenarios

Source	Victim
JTIDS/MIDS	UAT
JTIDS/MIDS	GPS L5
TCAS	UAT
DME/TACAN	UAT
DME/TACAN	GPS L5



Objective

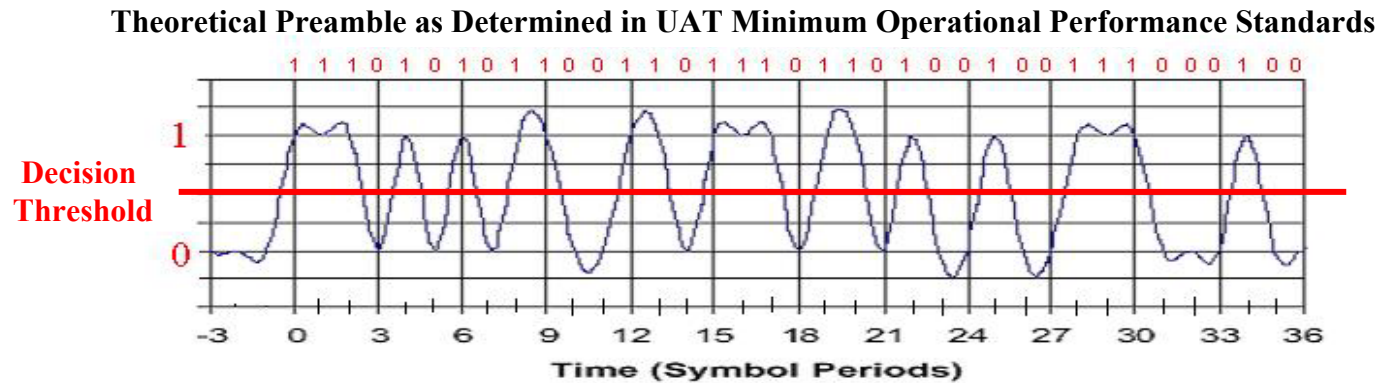
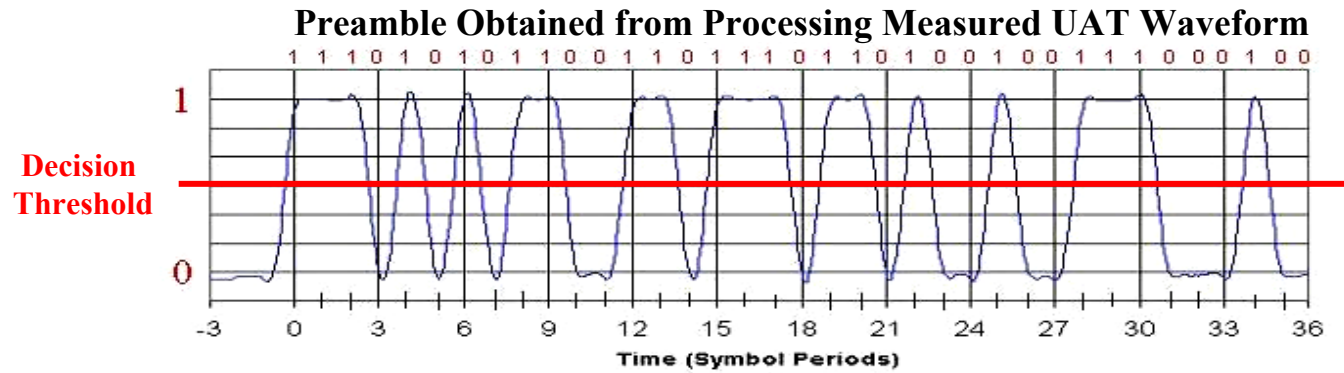
- **Develop an automated, high-fidelity, integrated spectrum-management tool suite for analysis of RFI issues in the 960–1215 MHz band**
- **Make the tool suite sufficiently flexible for ready extensibility to other spectral bands**
- **FY02 Focus: Predict UAT performance in a multi-aircraft interference environment through simulation**

Activities

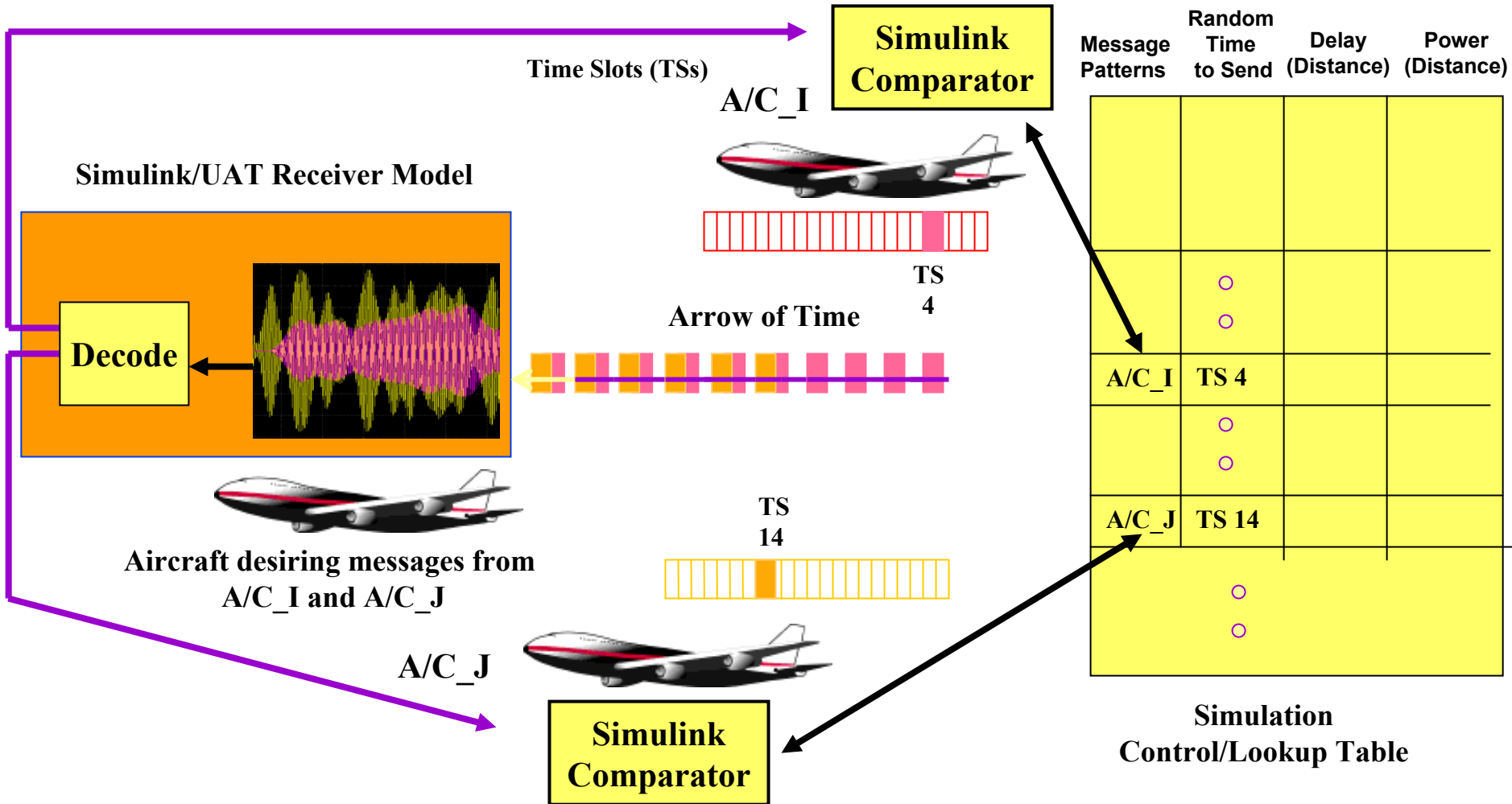
- **Developing a high-fidelity model of the UAT, using Simulink (a product of MathWorks, Inc.)**
- **Developing a model of an RFI environment for UAT using Simulink**
- **Developing a broadcast networking simulation in Simulink of UAT-equipped aircraft in the high-traffic LA Basin**
- **Collecting waveforms from 960–1215 MHz systems**
- **Validating models and data**

Highlight

Example of Validation Effort



Demonstration



Impacts

- **Creation of a high-fidelity, validated tool suite that can be used to demonstrate effective use of spectrum in the 960–1215 MHz band**
- **Capability for effectively supporting collaboration among users in the 960–1215 MHz band**
- **Availability of an integrated tool suite methodology that is extensible to other bands**

Future Plans

