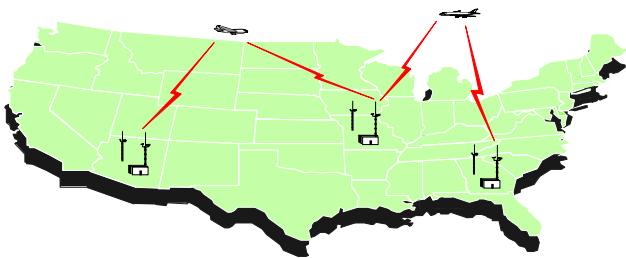




spectrumProspector™

Managing the scarce and valuable frequency resources of a nationwide air/ground (A/G) radio system is an immensely complex task. High-altitude airborne radios are mutually visible at very long ranges, increasing their exposure to co-channel interference and hindering frequency reuse. Ground-based A/G radios often share crowded sites where the threat of co-site interference greatly reduces the supply of usable frequencies.

As air traffic grows, the size and complexity of the A/G radio system grows with it, and so does the magnitude of the spectrum manager's task. Planned changes in the architecture of the worldwide very high frequency (VHF) A/G radio system will intensify these difficulties during the prolonged period of transition to the new architecture. Detailed, time-sequenced frequency plans must be developed to ensure a gradual, non-disruptive transition in which interference-prevention rules will be followed at every step. Automated support is essential for creating those transitional frequency plans.



For several years, The MITRE Corporation's Center for Advanced Aviation System Development (MITRE/CAASD) has supported the Federal Aviation Administration (FAA) in planning the future evolution of the nationwide A/G radio system for air traffic services. A key component of that support has been CAASD's development and use of *spectrumProspector*, an automated tool tailored to the needs of A/G radio spectrum management.

spectrumProspector models the desired and undesired electromagnetic interactions of large populations of A/G

radios and potential sources of interference to those radios. The tool is highly flexible and has many applications, including day-to-day frequency planning to meet new circuit requirements, spectrum planning for facility relocations or airspace redesign, predicting the effect of proposed radio design changes on spectrum-limited system capacity, and long-range spectrum planning for an architectural transition.

The Simulation Database contains user-supplied environmental data, lists of available frequencies, and frequency-assignment rules.

The Assignment Engine. *spectrumProspector's* assignment engine automatically generates a frequency plan for the postulated environment in accordance with the rules specified by the user. It has several user-selectable assignment strategies. The "gapfilling" strategy is the simplest and keeps all preexisting circuits on their old frequencies while the engine seeks violation-free assignments for one or more new circuits. In cases where spectral congestion is severe, the more powerful "neighbor-repacking" strategy generates incremental frequency plans in which preexisting assignments are successively changed to create spectral room for new circuits. *spectrumProspector's* "architecture-conversion" assignment strategy develops detailed incremental plans for converting part or all of the A/G radio system to a future architecture.

Reports. *spectrumProspector* can generate a wide variety of map displays and reports. One key output is a time-sequenced listing of all the radio conversions and/or retunings needed to carry out an incremental frequency plan.

For more information, contact:

Fran Hoover
Information Management Specialist
+1.703.983.5912