JERRY THOMPSON & ASSOCIATES, INC.

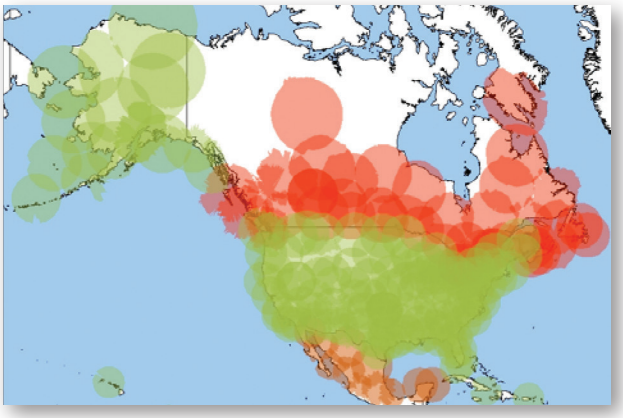
CNS COVERAGE MODEL

The Communication, Navigation, Surveillance (CNS) Coverage Model calculates the theoretical coverage of ground-based CNS facilities.

JTA developed the CNS Coverage Model to create coverage maps for communication, navigation, and surveillance devices to include:

- Primary and secondary radars
- Air-ground communication radios
- VHF Omni-Directional Range (VOR) stations
- Distance Measuring Equipment (DME) navigation aids

Given the complexities presented by terrain obstacles and atmospheric refraction in analyzing VHF and UHF signals, computing the theoretical coverage in a real world location requires complex calculations to account for such anomalies. The CNS Coverage Model automates coverage area calculations to produce precise and detailed coverage analysis.



Areas of radar coverage at 20,000' MSL in Canada, United States and Mexico plotted by the JTA ASET CNS Coverage Model.

The resulting coverage areas are overlaid upon precise JTA Master Maps featuring terrain, obstacles, airways and other elements. This has numerous applications such as determination of airspace and airway CNS coverage, assessing redundancy and gaps in coverage, and planning CNS device deployment.

Coverage Area Methodology:

- The model determines spot elevations along azimuth lines radiating from the device location from Shuttle Radar Topography Mission (SRTM) and U.S. Geological Survey Digital Elevation Models.
- The granularity of the resulting model of the surrounding terrain is configurable: the spacing between azimuth lines is adjustable from one degree upwards as well as the length of azimuth lines.
- The model calculates the screening angles along each azimuth out to the limit of the device's effective range.
- The model can then, based on the maximum screening angles along each azimuth, determine the device's coverage areas at different flight levels.

Union and Multiple Coverage: The CNS Coverage Model can also be used to calculate union and multiple coverage areas for multiple devices considered as a group.

Union coverage - shows the aggregate coverage resulting from multiple devices, ie. where at least one device provides coverage.

Multiple coverage - shows areas of various degrees of overlapping (redundant) coverage within the union coverage area, ie. where two or more devices provide coverage .

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