



DEFENSE

Air Force - Army - Navy

Effective radio communication for defense applications in difficult terrain and electronic warfare threats gives rise to exceptional demands in terms of reliability and durability. With its origins in the defense industry, Altair® WRAP™, an Altair® Feko® component, offers the analysis and computational tools required for all applications to meet these demands.

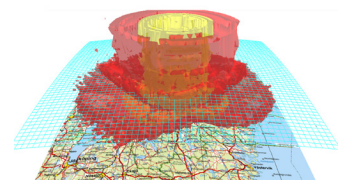
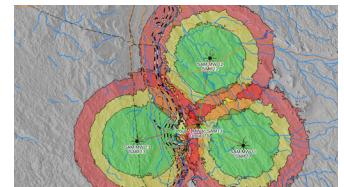
Intuitive Workflows, Comprehensive Results, Actionable Insights

WRAP supports the hierarchical process of military spectrum management. Frequency assignments to radio stations and nets are performed with automatic methods, ensuring compatibility with the authorized frequency utilization and band plans. Frequency lists and individual frequencies can be distributed electronically in file format, or through access to a common station/equipment/frequency database.

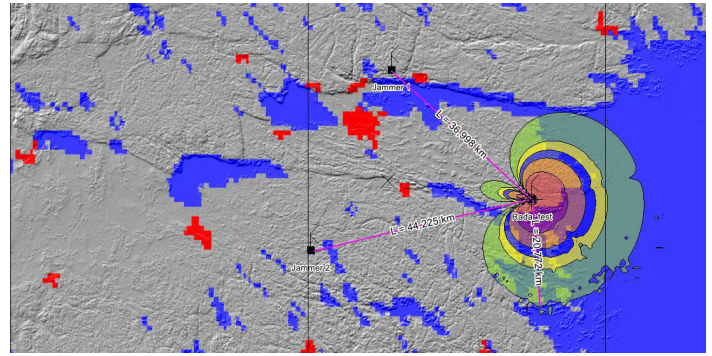
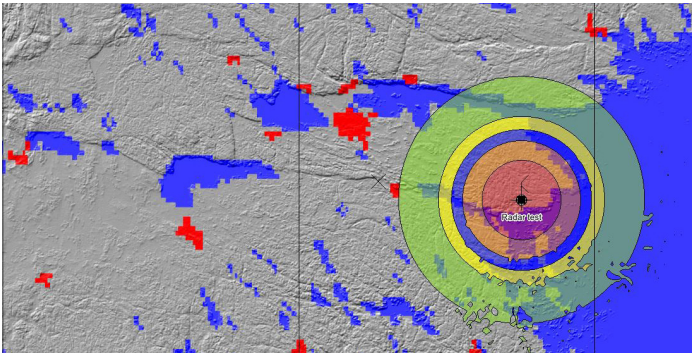
OVERCOME TOUGH TERRAIN AND ADVANCED ELECTRONIC WARFARE CHALLENGES WITH PRECISION SPECTRUM MANAGEMENT AND COMMUNICATION TOOLS

WRAP at Central Defense Spectrum Management Agency

Coordination among military and civilian organizations at both the national and international levels is supported by centrally managing frequency allocations, allotments, and assignments for national defense forces, distributing these coordinated elements to various branches - including the air force, army, navy, and other services. Additionally, WRAP aids in the design of radio communication systems, electromagnetic protection for vital operational requirements.



TOP: Ground-to-ground coverage of combat net radios
BOTTOM: Volume coverage calculation of a station presented in the 3D Map Viewer



Radar coverage for different RCS targets (1, 5, 10, 20, 100 sqm) at 300m AGL without (left) and with (right) jammer effect

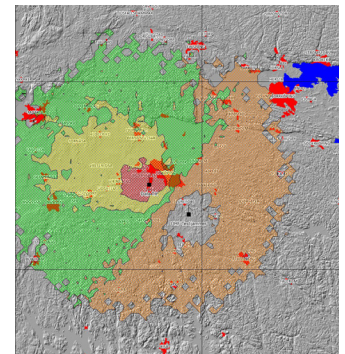
WRAP's comprehensive solution, ideally suited for defense forces' extensive frequency and radio network planning needs, supports central, regional, and command unit levels:

- **Central:** Strategic, long-term spectrum management. Support for designing and procuring new systems. Frequency management in consideration of international, national civilian, and military frequency allocations.
- **Regional/Service:** Strategic and tactical, short- and long-term spectrum management within the region/service. Support the detailed planning and design of new and existing systems.
- **Local/Unit:** Tactical, short-term planning of frequency utilization and unit deployments to support the current mission for successful radio communications, electronic warfare and radar coverage.

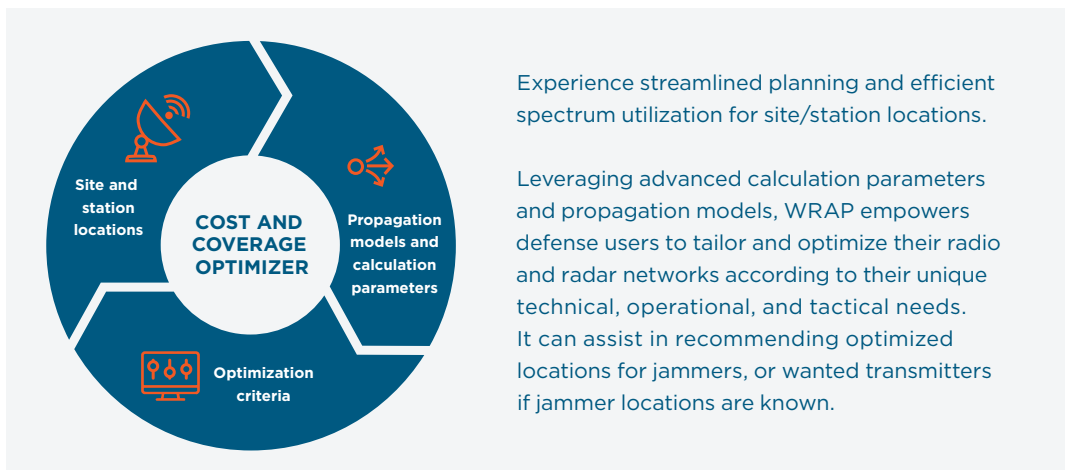
Advanced Spectrum Analysis and Communication Infrastructure Planning in Hostile Environments

WRAP can analyze the effects of both friendly and hostile jamming on radio communication and radar coverage. Additionally, it can compute the coverage for radio sensors, including direction finders and surveillance receivers.

WRAP provides capabilities to plan fixed and mobile radio sites, links, and networks for coverage, self-interference and frequency assignment in order to fulfil communication objectives. WRAP can also calculate radar coverage and line-of-sight coverage for optical sensor systems and satellite coverage and interference.



Signal-to-interference and noise ratio, S/(I+N), for the selected station with the effect of jammer (SINR varies from values >10dB shown in red, yellow: SINR>0dB, green: SINR > -10dB, orange: SINR > -30dB)

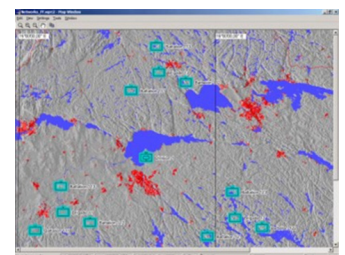


Experience streamlined planning and efficient spectrum utilization for site/station locations.

Leveraging advanced calculation parameters and propagation models, WRAP empowers defense users to tailor and optimize their radio and radar networks according to their unique technical, operational, and tactical needs. It can assist in recommending optimized locations for jammers, or wanted transmitters if jammer locations are known.



Network management - support for MIL-STD 2525B



Units, nets, and command structure handling

Learn more at altair.com/wrap-applications