

2011 DoD Spectrum Workshop

12 - 16 December, 2011



Presented by

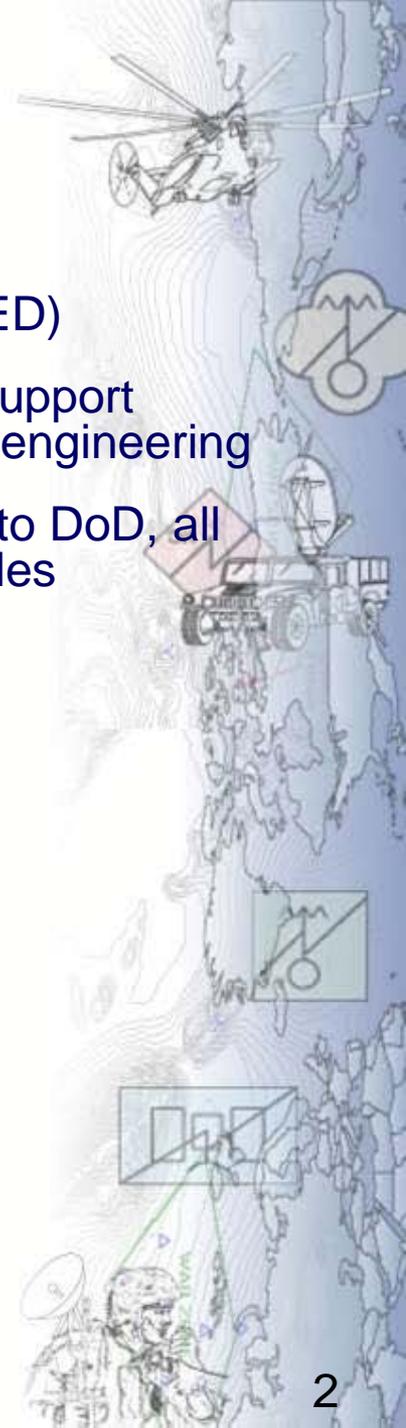
Gary Coffey

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SPEED Overview

- Systems Planning Engineering & Evaluation Device (SPEED)
- Modular software application that provides capabilities to support communications planning, spectrum management and RF engineering
- A Government-Off-The-Shelf (GOTS) program that is free to DoD, all federal agencies and available through Foreign Military Sales
- Current SPEED modules include:
 - Point-To-Point (PTP)
 - Radio Coverage Analysis (RCA)
 - Satellite Planner (SATPLAN)
 - High Frequency Communications Planner (HFCP)
 - Asset Manager (AM)
 - Force Structure Manager (FSM)
 - EPLRS Planner (EP)
 - Spectrum Management (SM)
 - Comm-On-The-Move (COTM)
 - Land Mobile Radio (LMR)
 - WiMAX Planner
 - CPoF Planner





SPEED Overview cont.

- SPEED has been operational since 1988
- Current fielded version is 10.0.3.112 (Mar 2010)
- Version 11.0 P1 release awaiting IA approval
- Navy Marine Corps Intranet (NMCI) software baseline compliant
- Army Certificate of Networkiness (CoN) signed 15 April 2011
- NIPRNET and SIPRNET authorized
- SPEED can operate inside of Command and Control Personal Computer (C2PC) as an injector to provide a near real-time RF COP
- Exchange air tracks with the Joint Mission Planning System (JMPS), FalconView, and other air mission planning systems that generate Common Route Definition (CRD) file outputs
- SPEED software and unclassified databases will be able to be downloaded via AKO: <https://www.us.army.mil/suite/designer>





SPEED Training

● SPEED is taught at the following locations:

- Marine Corps Radio/Communications Chief Course at 29 Palms, Ca.
- Marine Corps Communication Officer Course at Quantico, Va.
- Spectrum Operations Apprentices Course (SOAC) at Keesler AFB, Biloxi, Ms.
- Electromagnetic Spectrum Management (ESM) Course at Fort Gordon, Ga.
- Ft. Gordon Signal Officer courses, SCCC, BOLC, S6, PRT
- Ft. Sill Electronic Warfare Officer (EWO) school Incorporating SPEED into the EWO POI
- Joint Readiness Training Center (JRTC) Fort Polk, La.
- Mobile Training Team (MTT) support is provided to operating forces worldwide





Unclassified Version 11.0 P1 Features

- Windows Vista and Windows-7 32/64 bit compatibility
- Database conversion from MS Access to SQL Express
- Enhanced database management via XML import/export
- GPS support for tracking and saving real time routes
- User generated custom reports
- Enhanced mapping and visualization features
- Enhanced spectrum management/interference functionality
- Office 2007 look and feel (ribbons, themes, pinned dialogs)
- Architecture is being redesigned to decouple the business logic/processing from the user interface to more easily support a service-oriented architecture/cloud environment. (This could migrate over to support web and thin client applications.)



"We support web enabled, we will not support web dependant"



Unclassified

Version 11.0 P1 Features cont....

- Mean Sea Level/Above Ground Level (MSL/AGL) support for airborne routes
- Export of MilUnit locations and names
- Auto import of locations into the DB
- Directional antenna modeling enhancements
- Support for selectable gain antennas
- Generate, Import and Export of Shape Files (SHP)
- Generate and Import GeoTiff's
- CPoF overlay export integration
- Ability to change system affiliation (friendly, hostile, unknown)
- Capability to read Digital Terrain Elevation Data (DTED) Level 3
- Print overlay capability
- Auto detection of map folders





Unclassified

Version 11.0 P1 Features cont...



- WiMAX RF Planner integration
 - 802.16d (Fixed WiMAX) Point-To-Point (PTP) analysis
 - 802.16d (Fixed WiMAX) Point-To-Multi-Point (PMP) analysis
 - 802.16e (Mobile WiMAX) analysis
 - Multiple HATA COST-231 propagation models
 - Multiple Stanford University Interim (SUI) propagation models
- Numerous additional WiMAX enhancements from original planner
- Propagation analysis to support frequencies below 1 Mhz
- MCEB Pub-8 compliant conversion
 - Joint Restricted Frequency List (JRFL)
 - Standard Frequency Action Format (SFAF)



Ongoing Coordination with JSC to ensure successful integration



Unclassified Version 11.1 Features

- Continued Pub-8 development
 - Frequency proposal submission to SXXIO
 - Check status of proposals
 - Retrieve approved frequencies from SXXIO
- HF ALE multi-day enhancements
 - Multiday sunspot additions
 - Auto apply of ranked antennas
- Asset Manager enhancements
 - Redesigned GUI
 - Incorporation and automation of forms (ECR, SF-153)
 - Additional categories and fields
 - Sync Asset Manager with custom reports
 - Expanded personnel roster capabilities
 - Joint Manning Document (JMD) support
 - Convoy manifest





Unclassified

Version 11.1

Features cont....

- Enhancements to the AN/TRC-170 algorithm (Force Tropo)
- Ability to change map icons from a library of icons
- Import/Export of KML/KMZ files
- Support for both MSL and AGL settings
- Support for and modeling of antennas with different TX/RX gains
- Ability to select distant station or target parameters for coverage plots
 - Operator has the option of selecting limited or detailed parameters





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Map Data

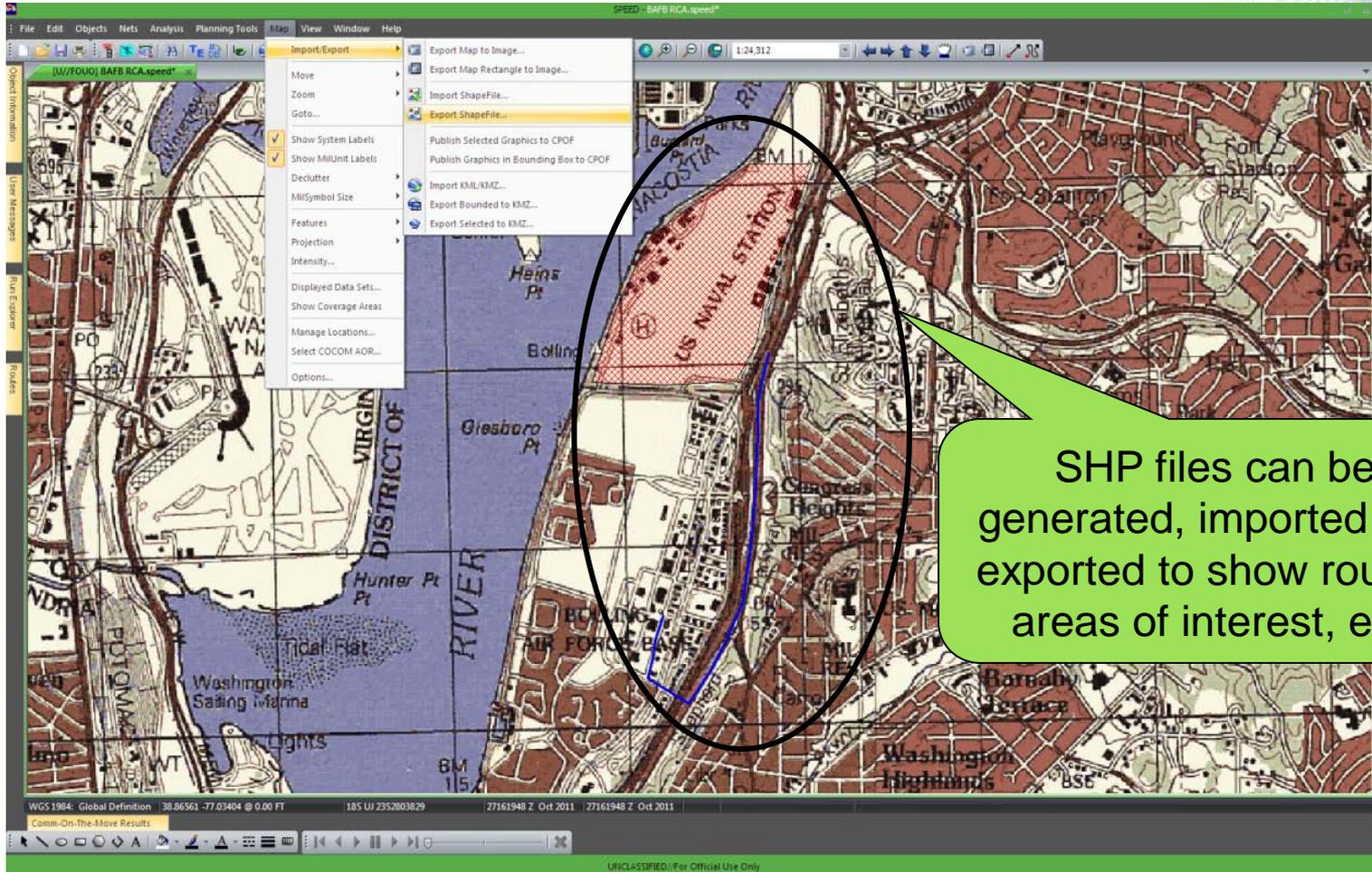
- The following map products are supported by SPEED:
 - Standard Digital Terrain Elevation Data (DTED) Level 1, 2 and 3
 - High Resolution Terrain Elevation (HRTE) Level 2 and 3
 - Shuttle Radar Topology Mission (SRTM) Level 1 and 2
 - Shuttle Radar Topology 2 Filled (SRT2f) Level 1 and 2
 - Compressed Arc Digitized Raster Graphics (CADRG)
 - Controlled Image Base (CIB) 1, 5 and 10 meter
 - Shape Files (shp)
 - KML/KMZ file import/export
 - GEO Tiffs





Unclassified

Shape (SHP) Files



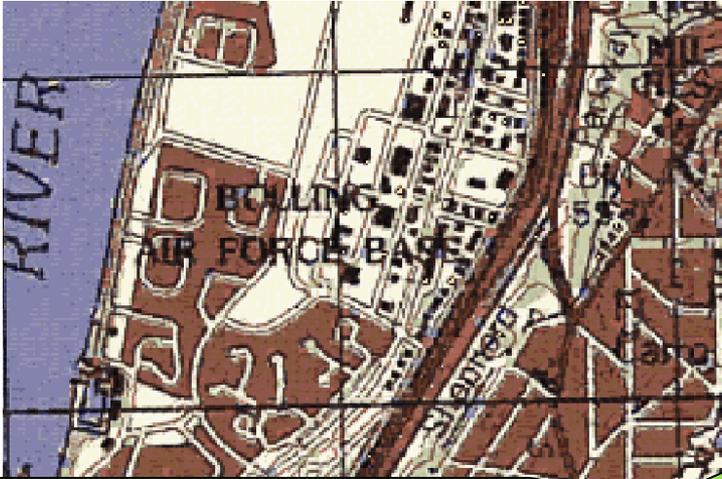
SHP files can be generated, imported and exported to show routes, areas of interest, etc.





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GEOTiffs



Users can import GEOTiff's or generate them from applications such as Google Earth to provide more detailed planning.

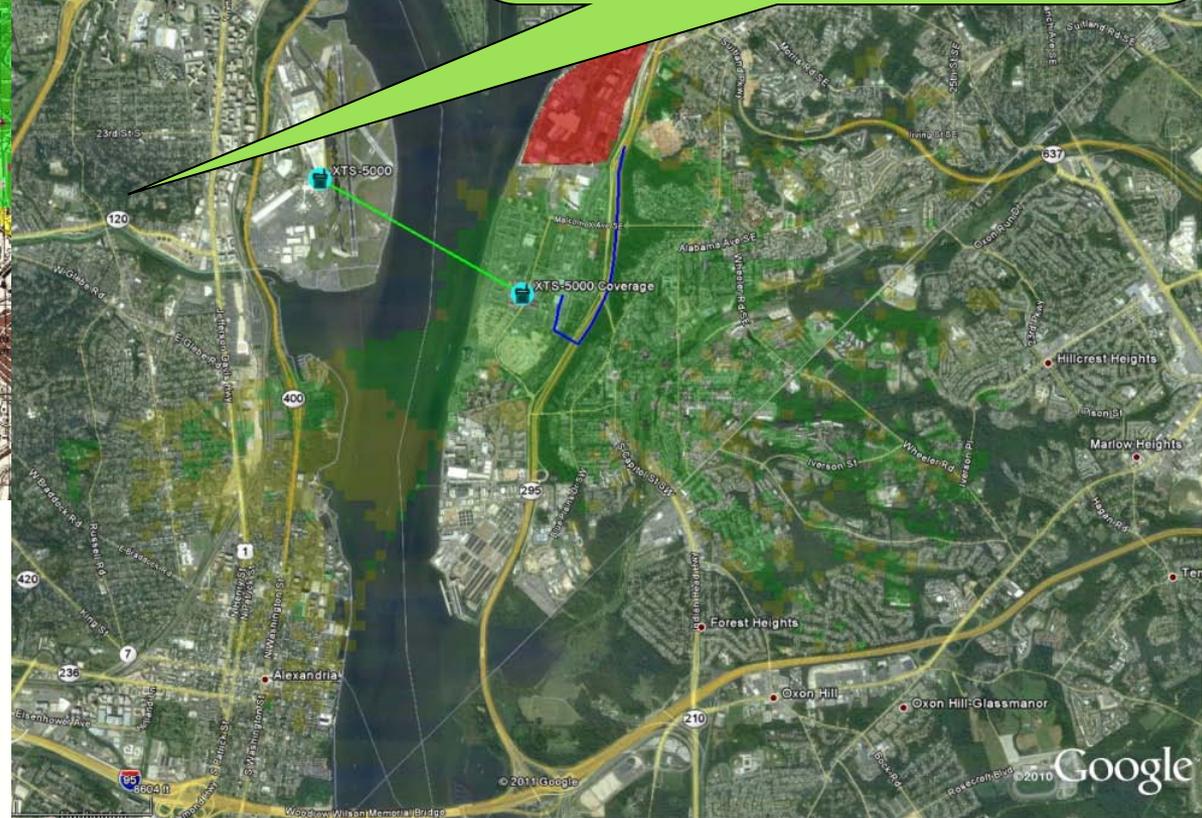
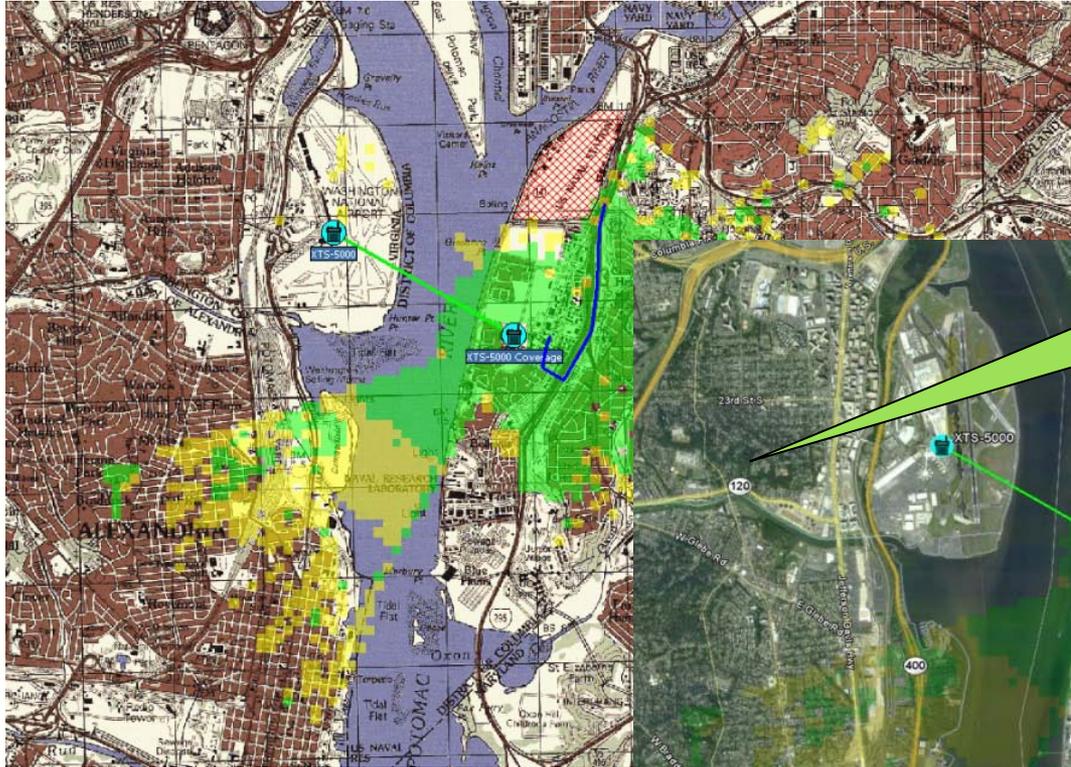




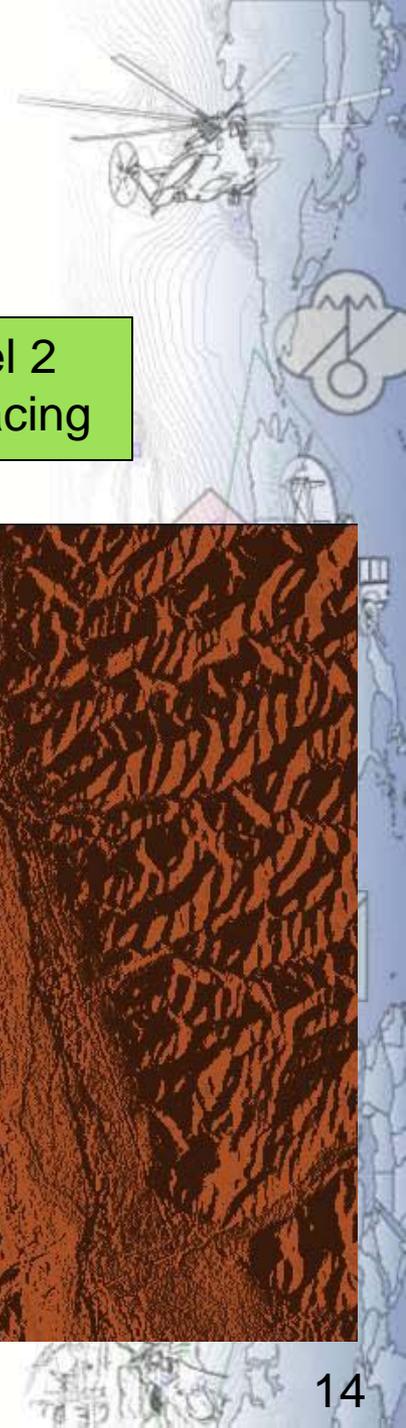
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KML/KMZ Files

Map graphics and analyses can be exported as KML/KMZ files and opened in Google Earth. SPEED can also import KML/KMZ files.

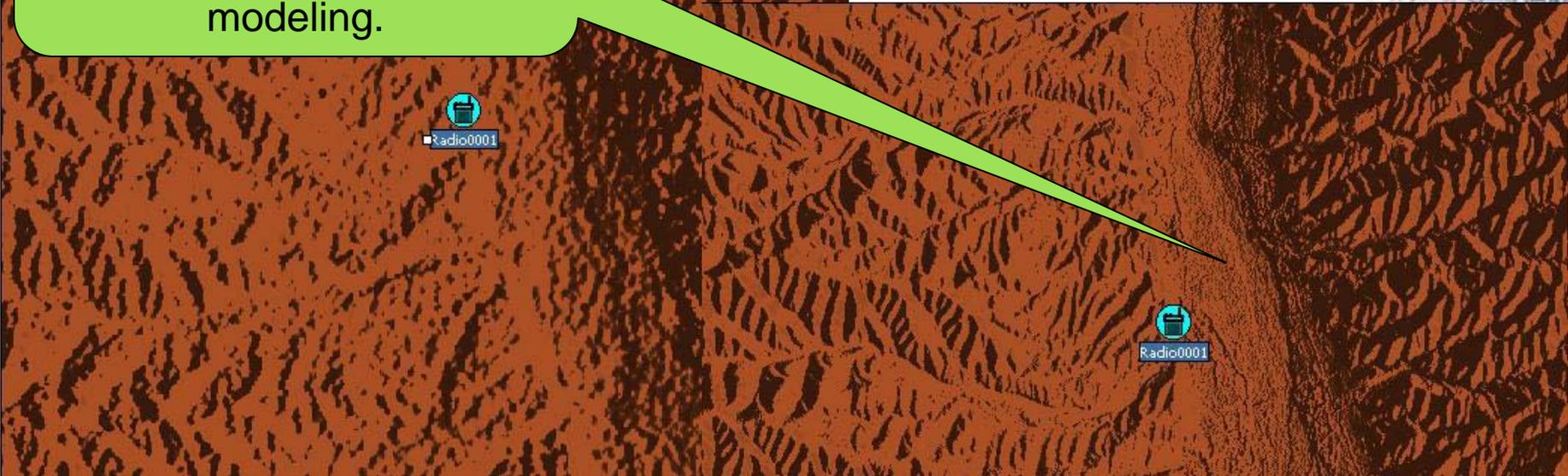
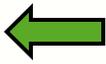


DTED Level 3

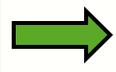


SPEED supports DTED Level 3 for more accurate analysis and terrain modeling.

DTED Level 2
30 meter spacing



DTED Level 3
10 meter spacing





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RF Engineering



SPEED supports an altitude of 30,000 meters

Rule sets are applied for LOS links

Point-to-Point Analysis Results

Link Name: PTP Link 0001 Change Name...

Statute Miles

Link Status: **Acceptable** Analysis Info... Print... LOS Results: **Acceptable**

Link Type: Analog DTED Level: Level 2

Left Radio		Right Radio	
Radio Name:	CAS	Radio Name:	FAC
Radio:	AN/PRC-117F	Radio:	AN/PRC-117F
Position:	34 24 05.33N 116 09 13.71W	Position:	34 35 00.00N 116 09 00.00W
Ant. Name:	LOS	Ant. Name:	LOS
Ant. Position:	34 24 05.33N 116 09 13.71W	Ant. Position:	34 35 00.00N 116 09 00.00W
Ant. Azimuth:	0.99070 degrees	Ant. Azimuth:	180.99285
Mag. Azimuth:	-11.46088 degrees	Mag. Azimuth:	168.50282
Takeoff Angle:	-4.17846 degrees	Takeoff Angle:	4.02350
Ant. Az Angle:	N/A degrees	Ant. Az Angle:	N/A
Ant. El Angle:	N/A degrees	Ant. El Angle:	N/A

Edit Terrain... Parameters... Ant. Clearance... Radio Info... Close

SPEED supports frequencies ranging below 1 Mhz to 20 Ghz

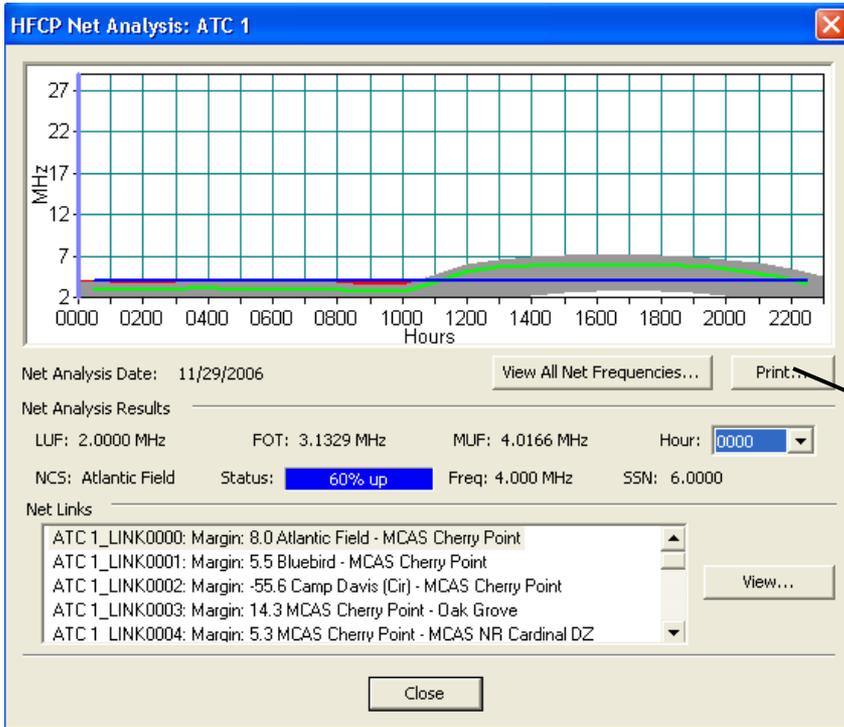




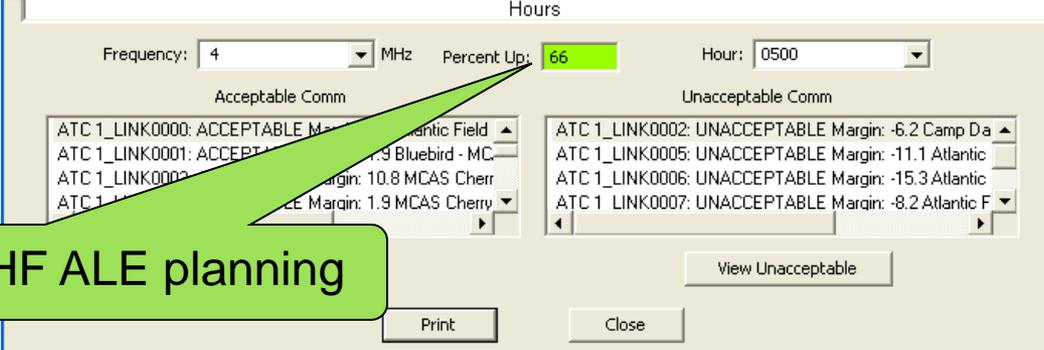
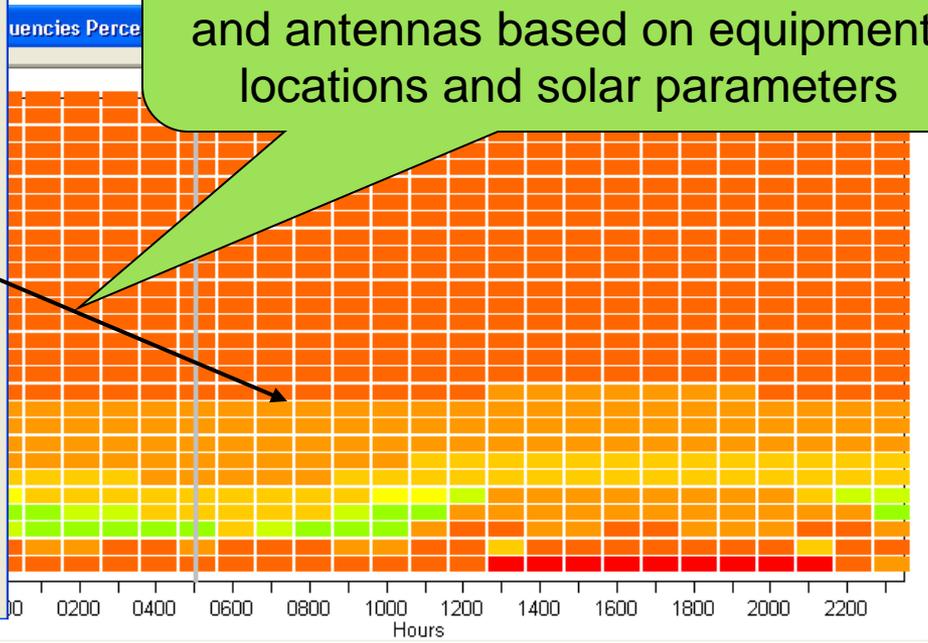
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RF Engineering

cont.



HF links can be analyzed to determine the optimum frequency and antennas based on equipment, locations and solar parameters



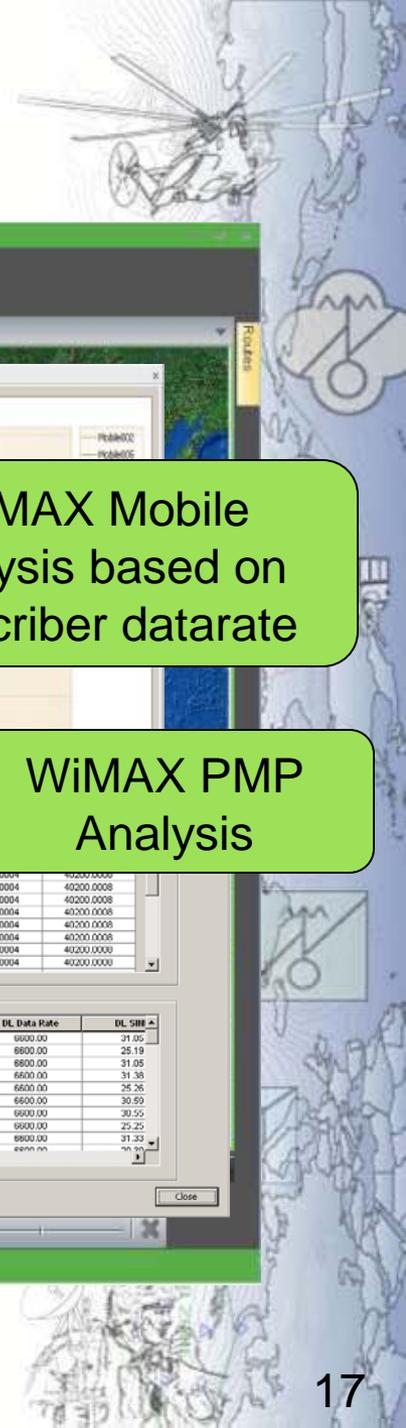
SPEED supports HF ALE planning



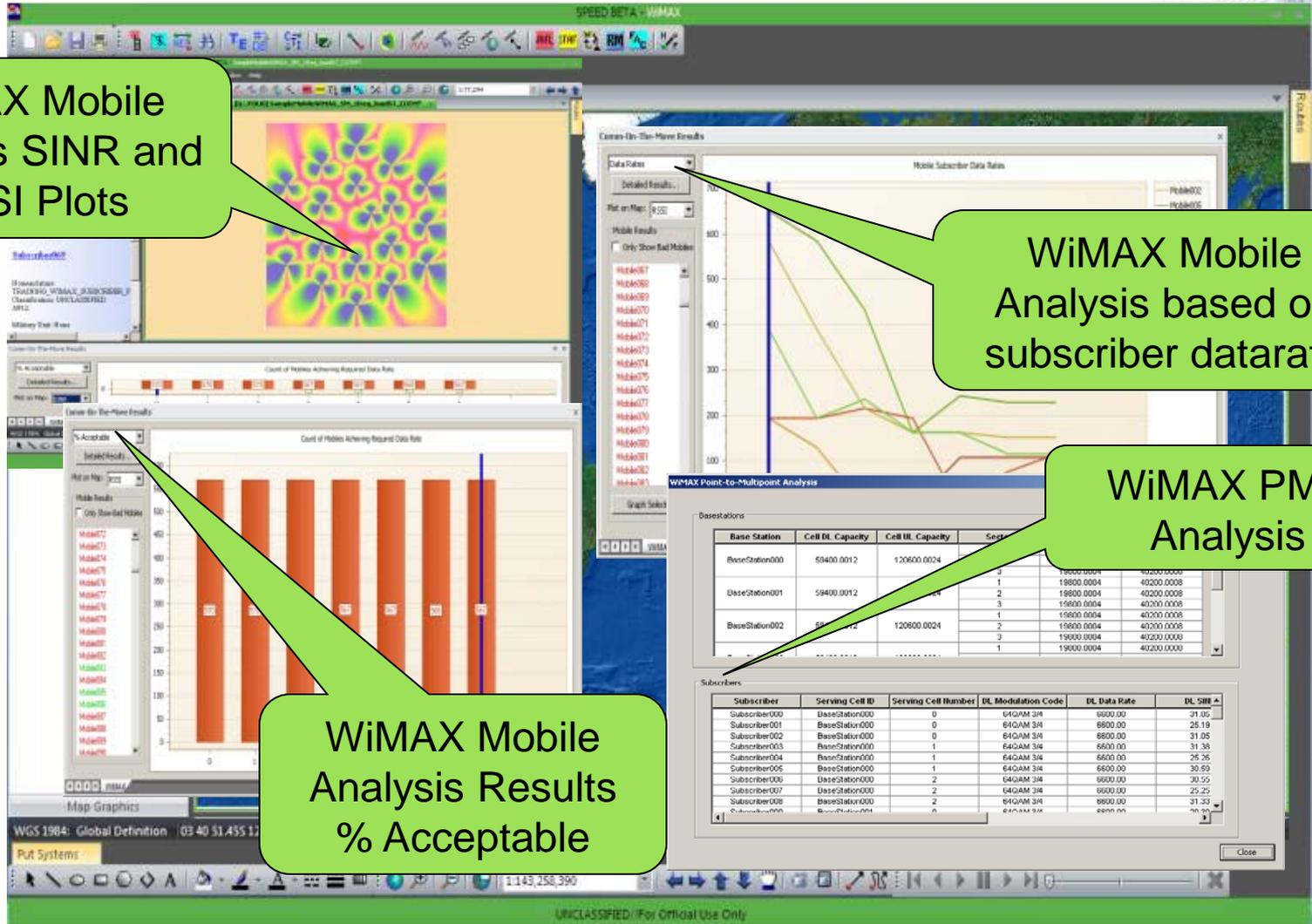


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WiMAX Engineering



WiMAX Mobile Analysis SINR and RSSI Plots



WiMAX Mobile Analysis based on subscriber data rate

WiMAX PMP Analysis

WiMAX Mobile Analysis Results % Acceptable



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Directional Antenna Modeling

Antenna

General | Antenna | Antenna Model

Antenna Geometry (Parabolic Dish)

Antenna Model Type: Parabolic Dish

Geometric Units: Meters

Feed X Location: [] Feed Y Location: [] Feed Z Location: [] Feed Cosine Power: []

Integration Points/WaveLength: [] X Polarization Amp: [] Y Polarization Amp: [] Phase XY: []

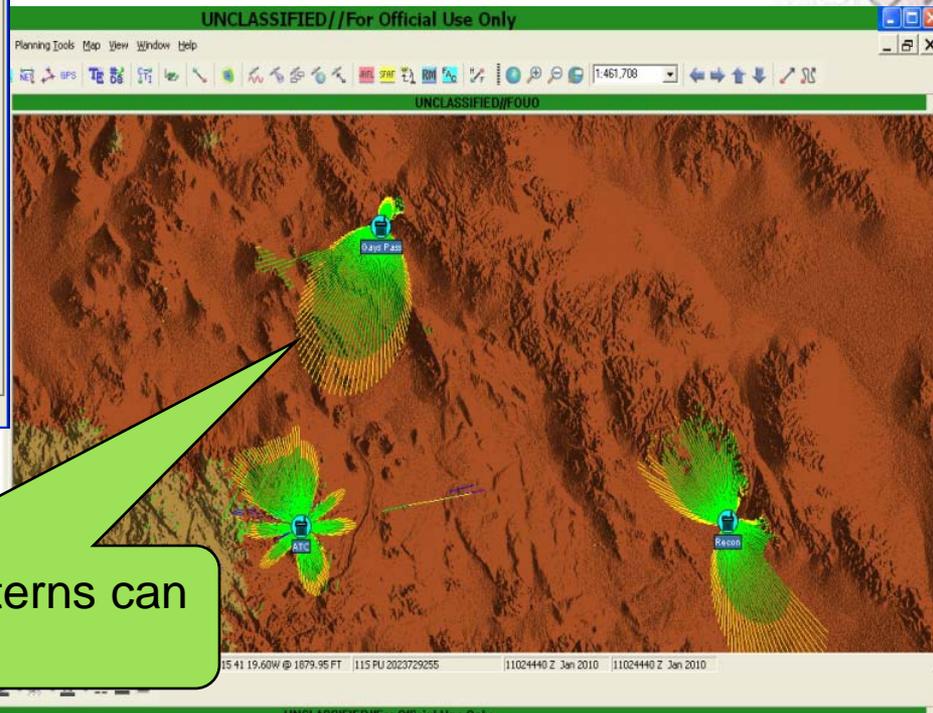
Azimuth Start: [] Stop: [] Increment: [] Elevation Start: [] Stop: [] Increment: [] Frequency (MHz): []

Frequency (MHz)	Azimuth	Elevation	Gain
-----------------	---------	-----------	------

Generate Grid Clear Grid

OK Cancel

Directional antennas can be modeled by generating antenna gain grids

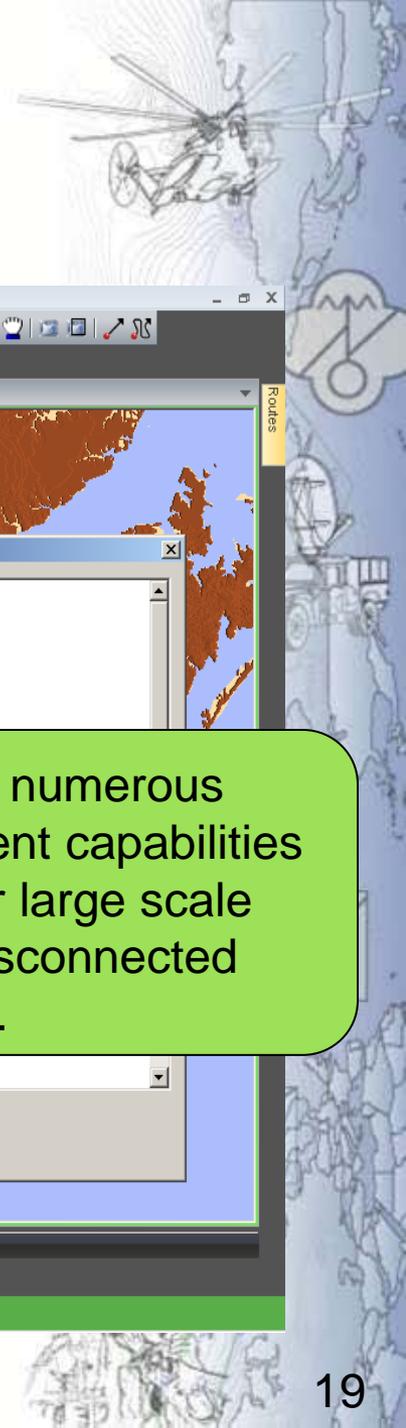


Directional antenna patterns can then be plotted





Unclassified Disconnected Spectrum Management



The screenshot displays the SPEED software interface with several key components:

- Radio Properties Dialog:** Shows 'Agency Serial Number (102): SPED090002' and 'SFAF System Type' options: Transmitter, Receiver, and Transmitter/Receiver.
- Spectrum Occupancy Chart:** A bar chart showing frequency occupancy from 2,000 to 28,880 MHz. The y-axis represents power in Watts (W), ranging from 0 to 10,000,000. The legend includes JRFL (purple), SFAF (green), Map (brown), 2nd Harm. (dark blue), and 3rd Harm. (light blue).
- SFAF Preview Dialog:** Lists parameters: 005, UE; 010, N; 102, SPED090002; 110, M4.98; 113, ML.
- Configuration Dialog:** Shows settings for 'MCI EAST', '2MEF', 'M20361', and 'NMSCO LANT'.
- Display Range:** Minimum Frequency: 2 MHz, Maximum Frequency: 30 MHz.
- Status Bar:** Displays coordinates: WGS 1984: Global Definition 34 46 20.34N 078 32 19.14W @ 94.87 FT 17S QU 2524750555 06171538 Z Dec 2010 06171538 Z Dec 2010.

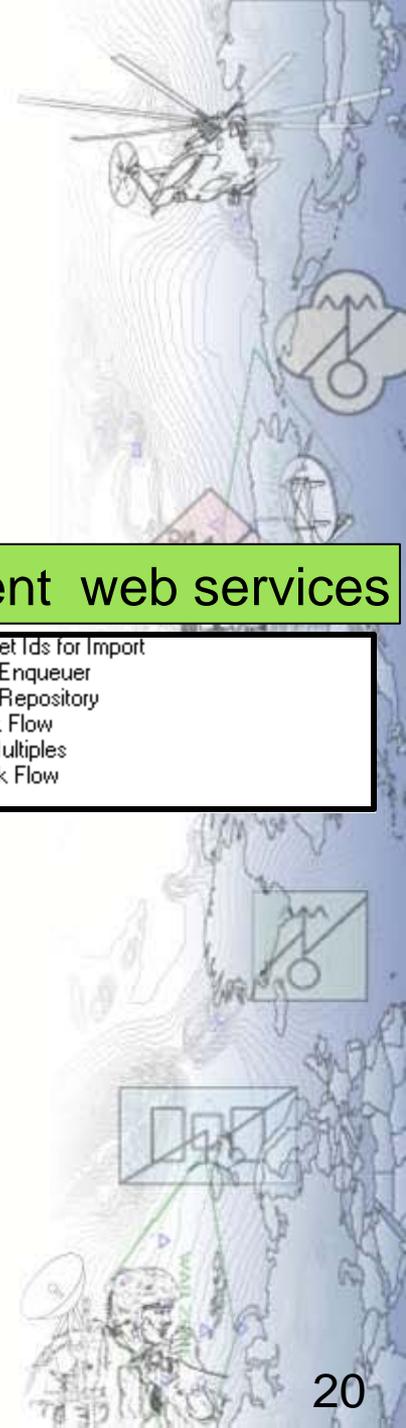
SPEED provides numerous spectrum management capabilities to support small or large scale operations in a disconnected setting.





Unclassified

Online or "Connected" Spectrum Management



Preferences and Options

- Application
 - General
 - Default System Environment
 - GPS
 - Map
 - SXXIO**
 - Analysis
 - General
 - COTM
 - HF
 - PTP
 - RCA
 - Satellite
 - Interference

User Profile Web Service URL:

Job Account Web Service URL:

User Name:

Job Account:

Web Service:

Web Service URL:

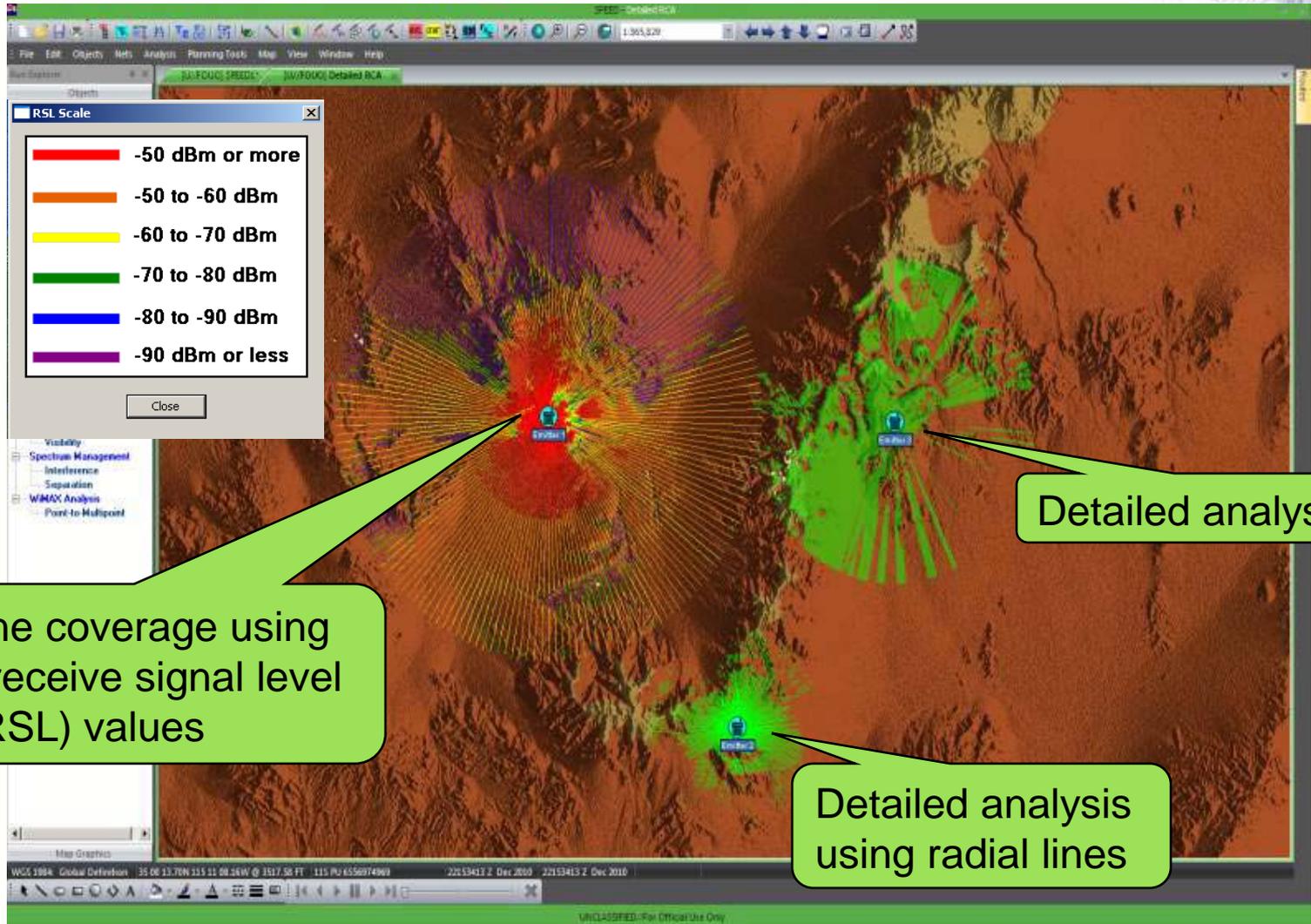
Current web services

- Clean Dataset Ids for Import
- Compliance Enqueuer
- Compliance Repository
- Delete Work Flow
- Get SSRF Multiples
- Publish Work Flow
- SSRF SEAF

SPEED is one of the first spectrum management tools to exchange web based services with Spectrum XXIO



Enhanced Coverage Plots



Radial line coverage using different receive signal level (RSL) values

Detailed analysis

Detailed analysis using radial lines





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Jammer Coverage Plots cont.



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RCA Analysis Properties

Analysis Type: Single Site Combined

Calculation: Jammer Coverage RSL Levels

Output Graphics: Polygons Grid

Check all the radios to include in the analysis. Select a radio or group of radios from the available radios list to set analysis parameters for those radios.

Radio Name	Transceiver	Band/Mode	TX Frequency	Power	Antenna
<input type="checkbox"/> 1/7 [AN/PRC-119F]	Transceiver	VHF low/Data-1	30.000000 MHz	4.000000 W	COM 201B
<input type="checkbox"/> 3/7 [AN/PRC-119F]	Transceiver	VHF low/Data-1	30.000000 MHz	4.000000 W	COM 201B
<input type="checkbox"/> 2/7 [AN/PRC-119F]	Transceiver	VHF low/Data-1	30.000000 MHz	4.000000 W	COM 201B
<input type="checkbox"/> 1/5 [AN/PRC-119F]	Transceiver	VHF low/Data-1	60.000000 MHz	4.000000 W	OE-254
<input type="checkbox"/> 3/5 [AN/PRC-119F]	Transceiver	VHF low/Data-1	60.000000 MHz	4.000000 W	COM 201B
<input checked="" type="checkbox"/> Chameleon [CHAMELEON]	Chameleon	Low 1/Band 1	20.000000 MHz	100.000000 W	CHAMELEON
<input type="checkbox"/> 2/5 [AN/PRC-119F]	Transceiver	VHF low/Data-1	60.000000 MHz	4.000000 W	COM 201B

Selected Radio Analysis Properties

Calculation Radius: 3 MI Analysis Interval: Coarse (100m)

Receiver Antenna Height: 30 FT Analysis Radials: Fine (720 radials)

Desired Fade Margin: 0 dB

Azimuth Start: 0 degrees Azimuth Stop: 360 degrees

Set Parameters For All Radios

Jammer Analysis Parameters

RSL Low: 0 dBm RSL High: 0 dBm

Target Pos: [] Width Around Target: 0 Deg

Communication link status is adjusted based on level of interference

Low and High dBm values, target location and area around the target can be defined for Jamming systems to show effectiveness.

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Limited technical data used in the unclassified version



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Interference Radials



Interference is shown as color coded radials based on terrain, distance, dBm levels and SNR w/SI.





Unclassified COTM



The screenshot displays the SPEED software interface. At the top, the title bar reads "SPEED BETA - 29 LAV-COTM SPEED DEMO.speed". The main window is titled "Point-to-Point Analysis Results" and shows a graph of signal strength in feet over a distance of 22 statute miles. A red line represents the signal strength, which starts at approximately 7000 feet and decreases to about 2000 feet. A blue shaded area below the red line indicates the ground profile. To the right of the graph is a map showing the location of Bearmat and Quackenbush. Below the graph, there are several panels: "Bi-Directional Analysis Results" showing "Link Status: Acceptable", "Right Radio" details for "Blacktop Cir - R4", and "Comm-On-The-Results" showing a dropdown menu with options: "Without Interference", "Without Interference", "With Interference", and "Both". The "Without Interference" option is selected. Below the dropdown is a "Report..." button. At the bottom of the screenshot, there is a "Point-to-Point Results" section with a bar chart showing signal strength for three links: "1/8 <-> 2/8", "UAV <-> R4", and "Bearmat <-> Quackenbush". The bar chart shows signal strength in feet over a distance of 39 statute miles. The "Bearmat <-> Quackenbush" link shows a signal strength that starts at approximately 7000 feet and decreases to about 2000 feet. The "UAV <-> R4" link shows a signal strength that starts at approximately 7000 feet and decreases to about 2000 feet. The "1/8 <-> 2/8" link shows a signal strength that starts at approximately 7000 feet and decreases to about 2000 feet. The status bar at the bottom of the software window shows "UNCLASSIFIED//For Official Use Only".

Both air and ground tracks can be analyzed to show potential interference

Results can be displayed with interference, without interference or both





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COTM with Jammers

Vehicle spacing, order of march, intra-convoy communications, convoy manifests and CREW protection can be pre-defined prior to movement to identify potential problems.

SPEED BETA - Pendleton MRAP convoy.sp

File Edit Objects Nets Analysis Planning Tools Map View Window Help

Routes

MSR Coffey

General Config Pts Analysis Pts

Name: MSR Coffey

Waypoints

Add Continuous path

Num	Position
0	33 13 22.54N 117 23 29.99W
1	33 13 49.17N 117 24 03.60W
2	33 14 05.45N 117 24 19.52W
3	33 14 16.54N 117 24 31.90W
4	33 14 27.64N 117 24 54.01W
5	33 14 57.96N 117 25 08.16W
6	33 15 17.93N 117 25 24.08W
7	33 15 42.34N 117 25 45.30W

Associated Systems

Associate Spacing: 100.0 m

Name	Distance (m)
MRAP-1 [MRAP (COUGAR)]	0.000000
MRAP-2 [MRAP (COUGAR)]	100.000000
MRAP-3 [MRAP (COUGAR)]	200.000000
MRAP-4 [MRAP (COUGAR)]	300.000000
MRAP-5 [MRAP (COUGAR)]	400.000000

CONVOY MANIFEST

DATE: 12/07/2011

UNIT: 26 MEU CALL SIGN: PAGE 2/2

CONVOY CDR: ASST CONVOY CDR:

OOM #	VEHICLE TYPE	VEHICLE #	POSITION	RANK	NAME	LAST4 SSN	BT	WEAPON TYPE	WEAPON #	TASKS
	ANMRC-145	033800C		1st Lieutenant	Johnson, Ruben Scott	1582	A-	Berretta 9 mm	99152	
	ANMRC-145	033800C		Lance Corporal	Barlett, Josiah Adam	1794	B+	M4	75314	
	ANMRC-145	033800C		Staff Sergeant	Anderson, John Lee	1840	AB+	Berretta 9 mm	98564	
	ANMRC-145	033800C		Private	Mendoza, Carl Robert	1846	B-	M4	66690	

Page 2 of 2





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GPS integration

Vehicle spacing, order of march, intra-convoy communications and CREW protection can be pre-defined prior to movement to identify potential problems.

Real time GPS integration allows the operator to track and record live routes

The screenshot displays the SPEED BETA software interface. The main window shows a map with a red-shaded area and a green route. A callout box points to the route. A detailed GPS data window is open on the right, showing position, velocity, satellite information, and fix status.

Current Position		Velocity	
Position:	33 15 03.24N 117 25 35.70W	Altitude:	71.33 FT
Speed:	0.0 MPH	True Course:	Deg.
Mag. Variation:	13.0 E Deg.		

Satellite Information	
99 dB	99 dB
50 dB	50 dB
0 dB	0 dB
PRN:	PRN:

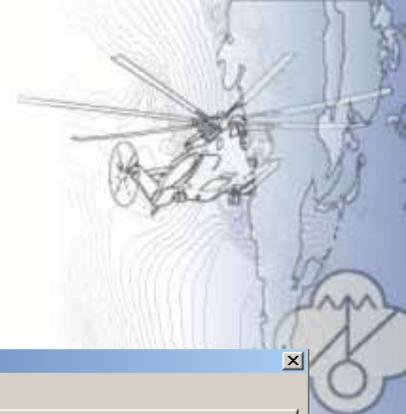
Fix Information	
GPS Sending:	Status: Valid
Last Update:	12/7/2010 4:47:42 PM
Quality:	GPS Fix





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Asset Manager



Asset Manager

This dialog allows you to manage the Table of Equipment by inserting new equipment, modifying existing equipment, or removing existing equipment in the table.

Equipment

Equipment	Serial Number	Set Number	Avail	Unit	Assigned
<input checked="" type="checkbox"/> AN/CYZ-10 [...]	439498	Unassigned	I	26 MEU	AN/MRC
<input checked="" type="checkbox"/> AN/GRA-39B	56743	M1830011	I	26 MEU	AN/MRC
<input checked="" type="checkbox"/> AN/GRA-39B	1234	M1830009	I	26 MEU	AN/MRC
<input type="checkbox"/> AN/MRC-145	034363C	Unassigned	R	26 MEU	
<input type="checkbox"/> AN/MRC-145	2404B	Unassigned	R	26 MEU	
<input checked="" type="checkbox"/> AN/MRC-145	033800C	Unassigned	R	26 MEU	
<input checked="" type="checkbox"/> AN/PRC-117F	1336	M1830001	I	26 MEU	AN/MRC
<input checked="" type="checkbox"/> AN/PRC-117F	1303	M1830002	I	26 MEU	AN/MRC
<input checked="" type="checkbox"/> AN/PRC-119F	019136B	M1839025	I	26 MEU	AN/MRC
<input checked="" type="checkbox"/> AN/PRC-119F	024847B	M1830028	I	26 MEU	AN/MRC

Visible Records: 31 Total Records: 31

Assign Assets

- Equipment
- Personnel

Available

Equipment	Serial Number	Set Number	Unit
AN/PRC-119F	025204B	M1830001	26 MEU
AN/PRC-119F	025330B	M1830002	26 MEU
AN/PRC-119F	031512B	M1830004	26 MEU
AN/PRC-150	1132	M1830004	26 MEU
AN/PRC-150	1329	M1830005	26 MEU
AN/PRC-150	1450	M1830001	26 MEU
AN/PRC-150	1818	M1830002	26 MEU

Assigned

Equipment	Serial Number
AN/CYZ-10 (DTD)	439498
AN/GRA-39B	1234
AN/GRA-39B	56743
AN/PRC-117F	1303
AN/PRC-117F	1336
AN/PRC-119F	019136B
AN/PRC-119F	024847B

Vehicle: AN/MRC-145
TAMCN: A1957 NSN: 5820-01-361-8536

Quantities

Reserve:	3	Temp Loan:	0
Maintenance:	0	In Use:	0
Total Quantity:		3	

Import Export

Modify Personnel

Personal Info Military Info Training Info Equipment JMD Info

Fiscal Year: [] Exercise: [] Capability Desc.: []

Line Number: [] Echelon: [] Director TE: []

Work Section: [] BRD/CELL/WG: [] Duty Location: []

Billet Title: [] Billet Grade: [] Billet Service: []

Billet MOS: [] Billet S. Clearance: [] Billet Arr. Date: [] Billet Dpt. Date: []

Billet POC: [] Billet Email: [] Billet Phone: []

PRI: [] Billet Description: []

Funding: [] Special Inst: []

GRD: [] Rank: 1st Lieutenant

Last Name: Johnson First Name: Ruben MI: Scott MOS: 602

SSN (Last 4): 1582 Service: Marine Corps S. Clearance: [] GNDR: Male BT: A-

Reservist: [] Duty Phone: [] Duty Email: []

Country: [] Source: [] Division: []

BN/Squadron: [] Act. Arr. Date: []

Phone: []

A/SPOD: []

Deployment: []

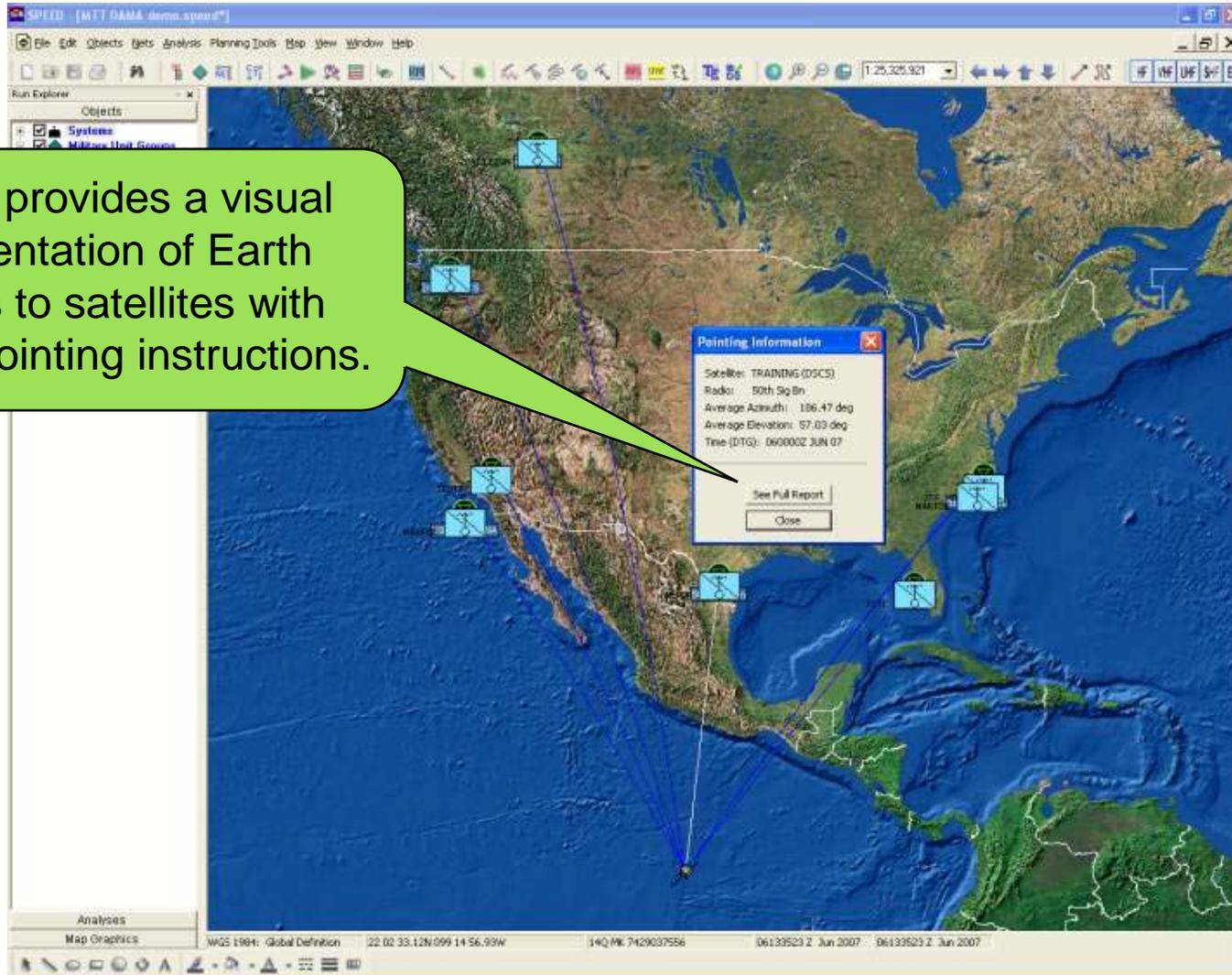
Mission: []

OK Cancel

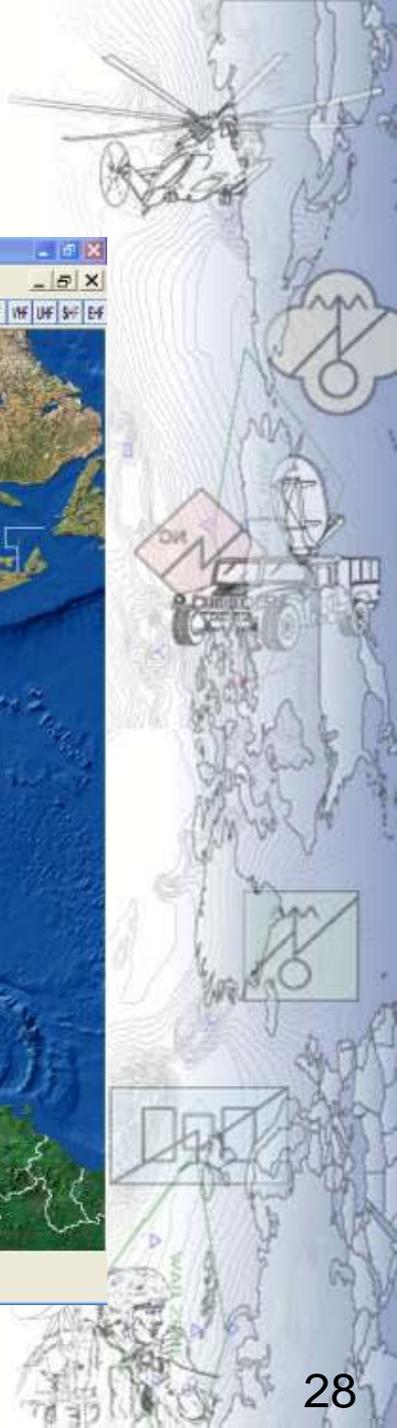
Asset Manager allows the planner to quickly manage personal and equipment to support deployed operations. Joint Manning Documents (JMD) can also be imported and exported.



Satellite Look Angles



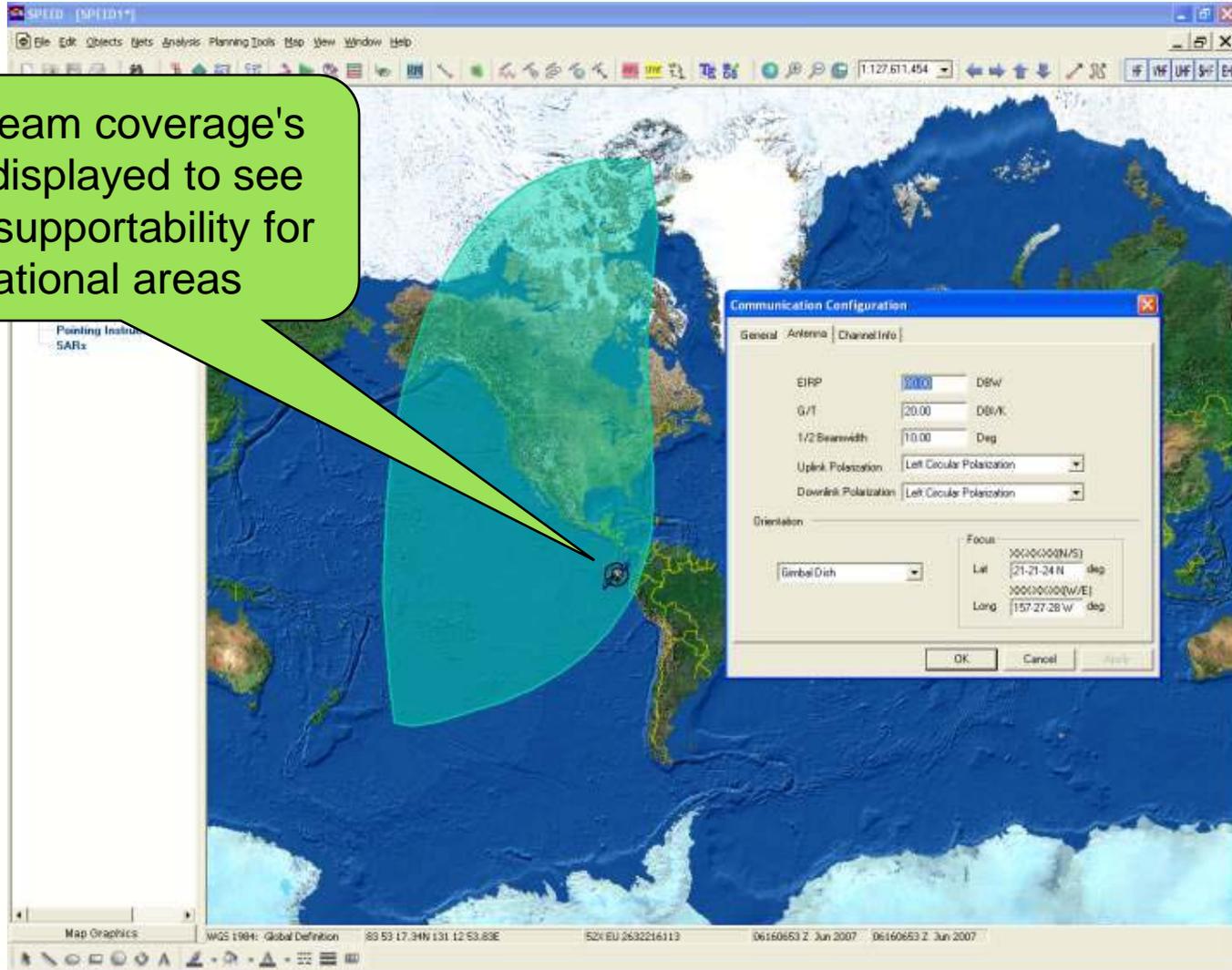
SPEED provides a visual representation of Earth stations to satellites with detailed pointing instructions.



Satellite Footprints



Focus beam coverage's can be displayed to see satellite supportability for operational areas

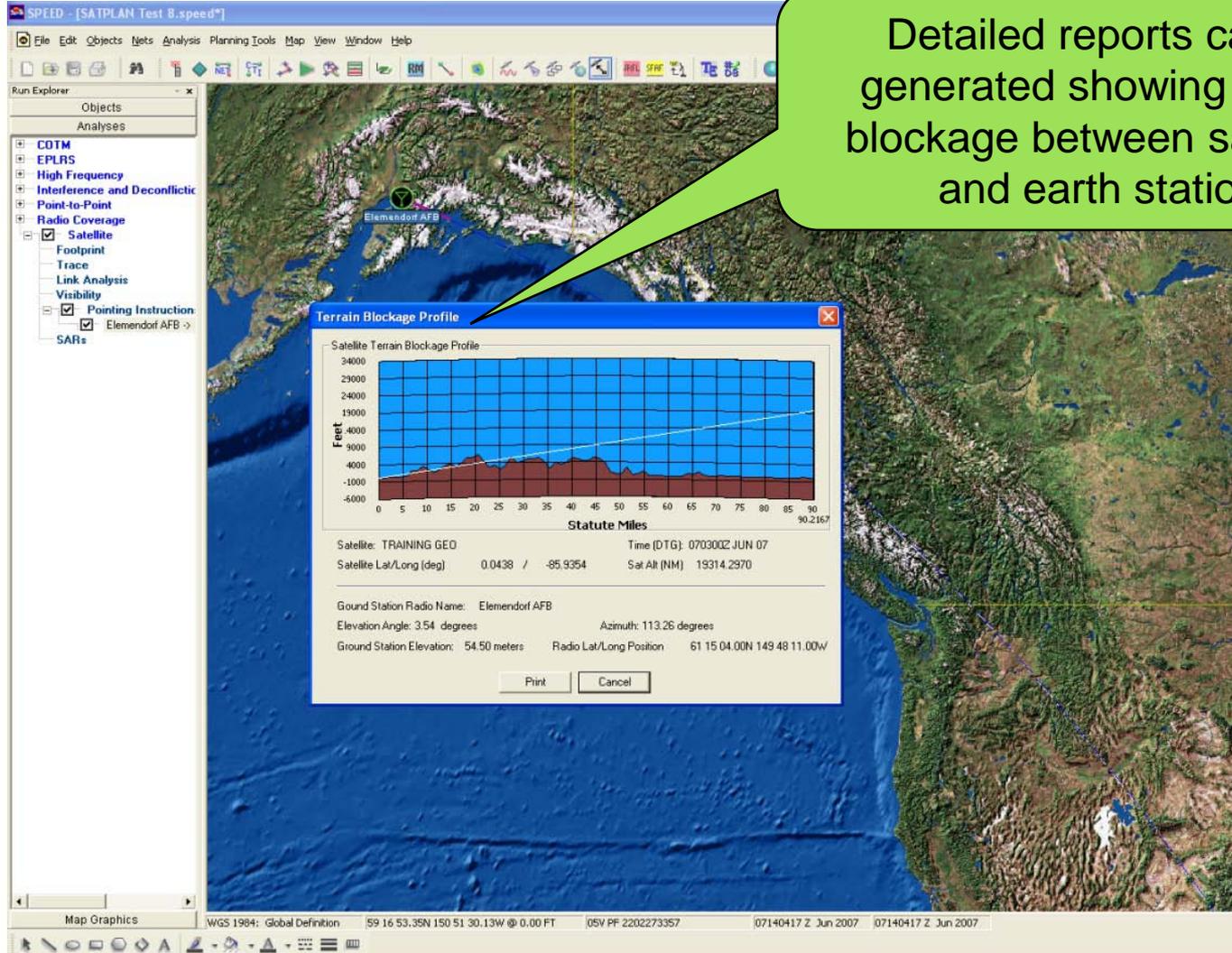




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Satellite Terrain Blockage

Detailed reports can be generated showing terrain blockage between satellites and earth stations





Unclassified

Satellite Access Requests

UHF TACSAT SAR's can be generated using pre-defined network parameters

The screenshot shows the SPEED software interface. On the left, a tree view under 'Objects' lists various systems and units, including 'Military Unit Groups' and 'Radio Nets'. The main area displays a satellite map of the Pacific region. An 'Edit SAR' dialog box is open, showing a pre-defined message template for a UHF TACSAT SAR request. The template includes recipient information, classification, and request details.

FM CG 4TH MEB
TO CG MARFORCOM
INFO GSSC PETERSON AFB CO
JOINT STAFF WASHINGTON DC//J6Z//
USSTRATCOM CL182
CG II MEF, G-6

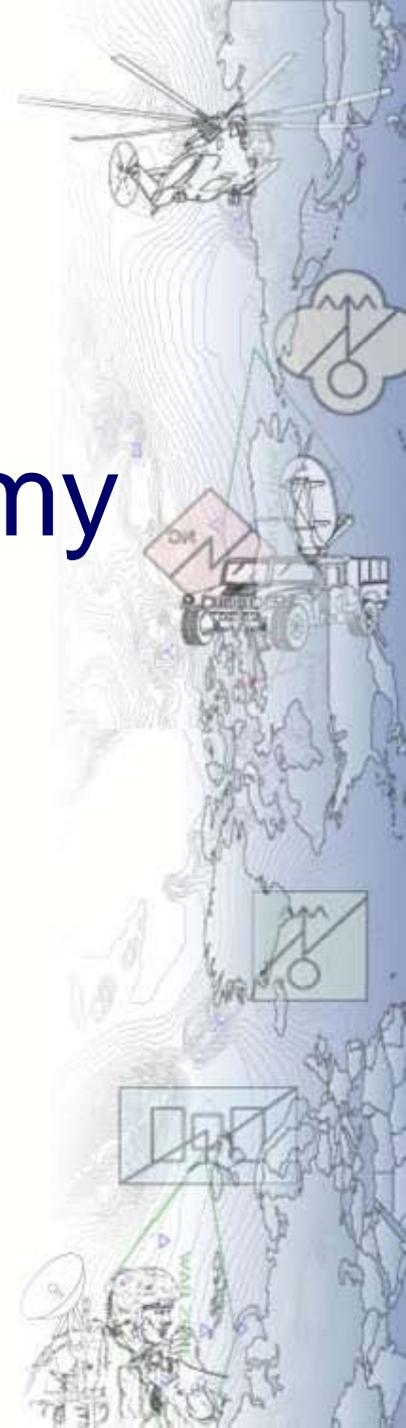
BT
UNCLAS
GYSGT MARINE/G-6 SMO//J-1
SUBJ/UHF SATELLITE ACCESS REQUEST (U//
REF/A/CJCSI/6250.01C/30 APRIL 2007
REF/B/CJCSI/6250.01B/28 MAY 2004
NARR/ REF A IS OVERARCHING POLICY DOCUMENT FOR SATCOM
MANAGEMENT.
REF B IS DAMA COMPLIANCE AND WAIVER GUIDANCE POLICY/
RMKS/1.(U)IAW REF A AND B, REQUEST VALIDATION AND ACCESS
AUTHORIZATION FOR THE FOLLOWING SAR.
2. REQUEST CATEGORY (U).
A. (U) **NEW**
B. (U) N/A
C. (U) **ISO JTF NORTH AMERICA**
3. REQUESTOR (U)
A. (U) **II MEF G-6, CLNC**
B. (U) **GYSGT MARINE/DSN: 951-8636/MATT.MARINE@USMC.MIL**
C. (U) **JTF-56A**
D. (U) **II MEF**
E. (U) **NORTHCOM**
4. NETWORK DESCRIPTION (U)
A. 1. (U) **JOINT COMMAND NET**
2. (U) **VIASAT DATA**



Unclassified



SPEED in support of Army Electronic Warfare





EW Snap-In Background



- Army (PMEW) had 3 JUONS from theatre that addressed gaps in electronic warfare capabilities.
- One of those JUONS called for an EW planning tool.
- To meet the needs and intent of a JUON, new development was ruled out, so the Army conducted an evaluation of other existing tools and SPEED was selected for various reasons.
 - Positive feedback from EWO's that evaluated different tools at Ft. Sill in 2010
 - The amount of current Army SPEED users
 - Software was already accredited for the Army network
 - Software was already a program of instruction (POI) within the Army schoolhouses
 - Contract vehicle (SPEED) already in place
- Funding was transferred to the SPEED program to develop the EW functionality as a snap-in to the SPEED baseline.





EW Snap-in Overview



- The Electronic Warfare snap-in is not a stand alone application. It utilizes the SPEED baseline as its foundation, ensuring SPEED specific interoperability between other SPEED users.
- The EW snap-in will install and operate on top of version 11.0 Patch 1 and version 11.1 offering the full capability of SPEED which has numerous EWO capabilities already along with added functionality to directly support the Electronic Warfare Officer (EWO) in their operational planning and analysis.
- Since SPEED is already used throughout the different services and taught at both Army and Marine Corps school houses the learning curve to be proficient on the EW snap-in will be minimal.





Unclassified Drop 1 Snap-in Features



- All the capabilities in version 11.0 Patch plus the following:
- 3D visualization (Not integrated within SPEED)
- JTASR/EARF templates
- Import emitter data containing time/spatial information
- Import of ASAS data
- Import of ELAT data from CREW systems
- Jam Plan based off of target equipment parameters
- Import/Export of KML/KMZ files to use with Google Earth
- mIRC chat capability to communicate with other IP based systems
- VLC media player to view ISR feeds





Unclassified Drop 2 Snap-in Features



- Ability to import and model measured ARAT data
- Addition of the JSC JETS database to SPEED to provide a more robust emitter database for building the environmental background.
- Jammer Measure of Effectiveness (MOE) templates
- Joint Spectrum Interference Report (JSIR) template
- Ability to access the ESPACE web site, generate queries and download data.
- Ability to access the CEDRIC web site, generate queries and download data.
- Ability to access significant activities (SIGACTs) based on time/spatial queries (SIGACTs) via Data Dissemination Service/Publish and Subscribe Service (DDS/PASS) and display them on the map for added situational awareness.



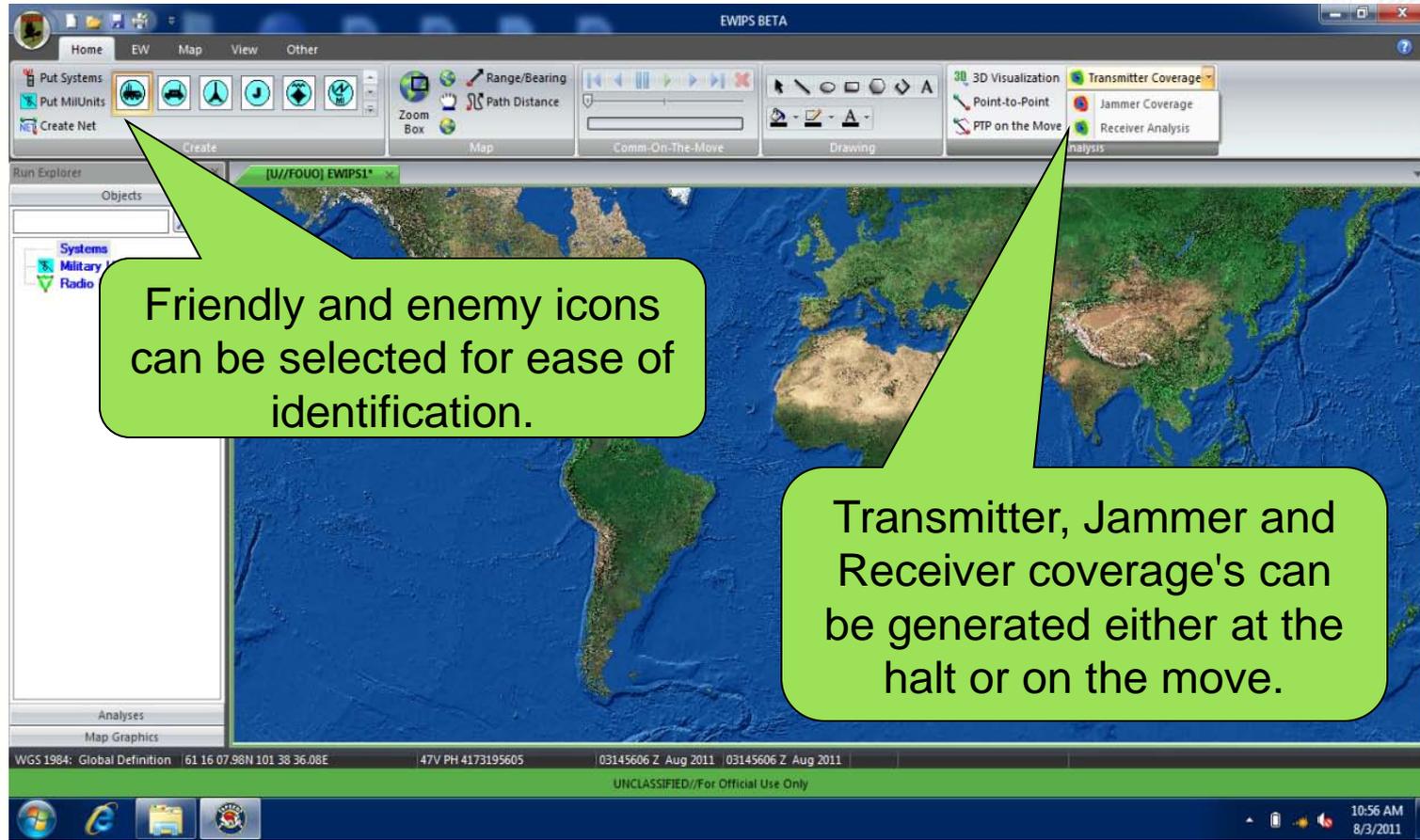


EW Snap-in Functions





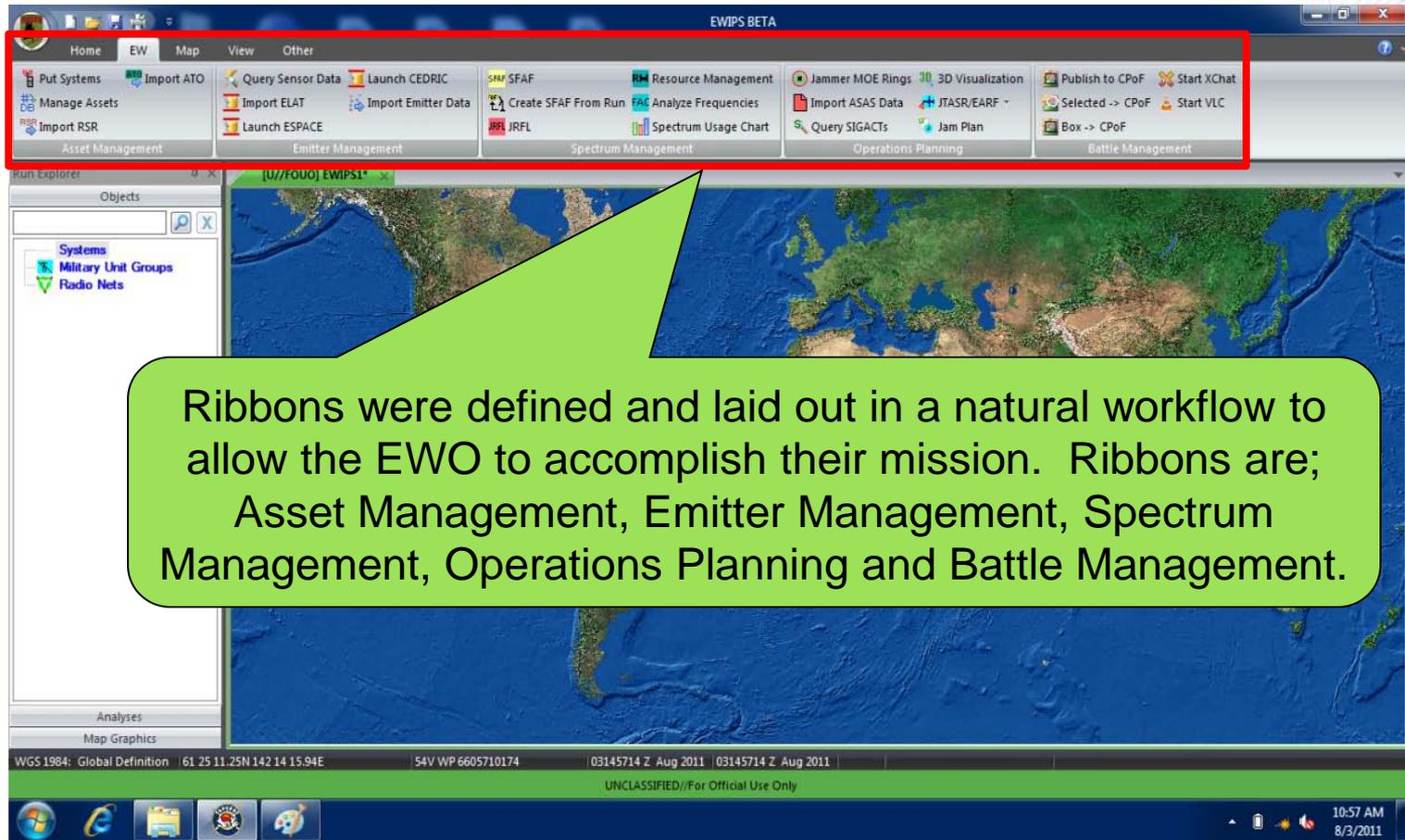
Unclassified EW ribbons





Unclassified

EW Ribbons cont...



Ribbons were defined and laid out in a natural workflow to allow the EWO to accomplish their mission. Ribbons are; Asset Management, Emitter Management, Spectrum Management, Operations Planning and Battle Management.





Unclassified

JTASR/EARF Template



Once a target on the map has been identified a JTASR/EARF can be generated for submission.

JTASR/EARF

Requestor: _____

Unit: _____

Requestor Name: _____

Planning: _____

System/Emitter/MI/Unit	RX Freq Range	RX Freq	TX Freq Range	TX Freq
------------------------	---------------	---------	---------------	---------

JTASR/EARF

TARGET IS/NUMBER OF

PERS IN OPEN PERS DUG IN WPNS/MG/RR/A' MORTARS. ARTY

AAA ADA RKTS MISSILE ARMOR VEHICLES

BLDGS BRIDGES PILLBOX, BUNKERS SUPPLIES, EQUIP

CENTER (CP. COM) AREA ROUTE MOVING

TARGET LOCATION

NW: _____ NE: _____ SE: _____ SW: _____

TARGET TIME/DATE

START: Date: 8/ 3/2011 Time: 11:07:09 AM

TO: Date: 8/ 3/2011 Time: 11:07:09 AM

DESIRED ORD/RESULTS: _____

FINAL CONTROL: CALL: _____ FREQUENCY: _____

REMARKS

TGT: _____ TGT: _____

REMARKS: _____

OK Cancel

Based on target and map data the form can be auto populated. The EARF template is only available on classified systems.





Unclassified

Sensor Query Dialog



The screenshot shows the 'EWIPS BETA - Jam Plan*' application window. A 'Query Options' dialog box is open, allowing users to filter sensor data logs. The dialog includes several sections:

- Sources:** A dropdown menu.
- Affiliations:** Three checked checkboxes for 'Blue', 'Red', and 'Gray'.
- Frequency:** 'Min. Frequency' (0.0001 MHz) and 'Max. Frequency' (20000 MHz).
- Date-Time:** 'Start Date-Time' and 'End Date-Time' (both 8/ 3/2011 19:04:24 Z).
- Power:** 'Min. Power' and 'Max. Power' (both -120 dBm).
- Area:** 'Bound' checkbox and input fields for 'Top Left' and 'Bottom Right' coordinates.

Buttons for 'OK' and 'Cancel' are at the bottom. A green callout bubble points to the 'Red' checkbox with the text: 'Various sensor data can be queried based on different parameters and then plotted on the map for analysis.' The background shows a topographic map with red and gray sensor data points overlaid.





Unclassified Jam Plan



Target

Name : South Tower 1 Effect : Deny

Target

Map System System Type

System Name	Transceiver	Band/Mode	Frequency	Ar
Enemy Repeater Tower...	Transceiver	VHF/Voice-1	30.000000 MHz	M
Enemy Repeater Tower...	Transceiver	VHF/Data 3	138.000000 MHz	M
Enemy Repeater Tower...	Transceiver	UHF/Voice 1	406.000000 MHz	TL

Affiliation

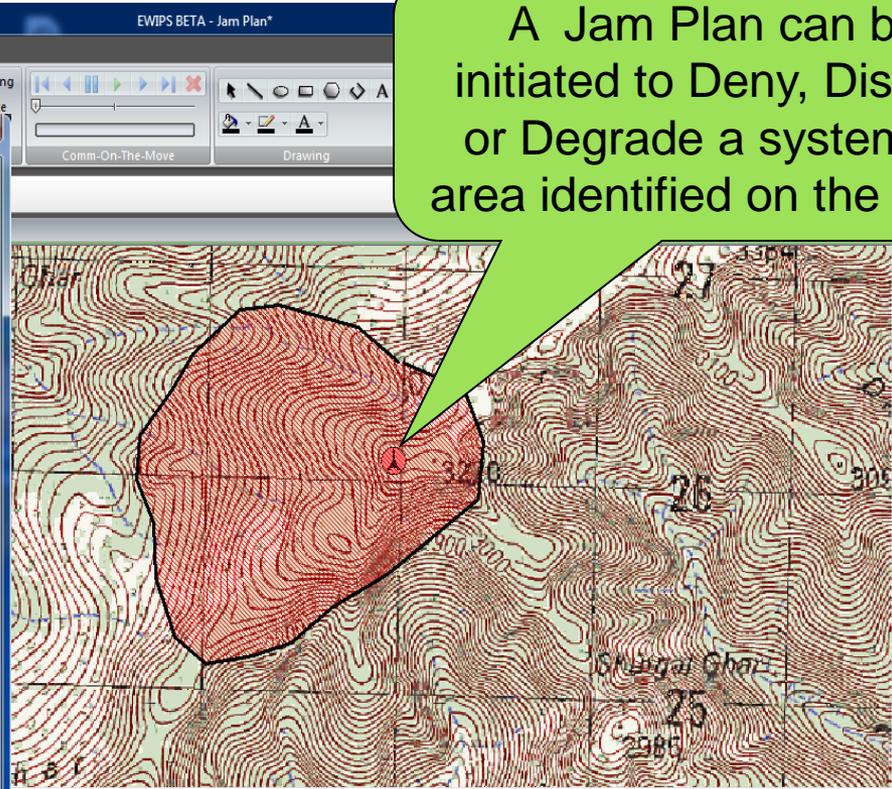
Friendly Hostile Unknown Neutral

Frequency (MHz)

420

OK Cancel

A Jam Plan can be initiated to Deny, Disrupt or Degrade a system or area identified on the map.



EWIPS BETA - Jam Plan*

Home EW Map View Other

Put Systems Put MilUnits Range/Bearing Path Distance

Comm-On-The-Move Drawing

03151051 Z Aug 2011 03151051 Z Aug 2011

UNCLASSIFIED//For Official Use Only

11:10 AM 8/3/2011





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Receiver Plot



The screenshot shows the EWIPS BETA software interface. The 'RCA Analysis Properties' dialog box is open, displaying the following settings:

- Calculation:** Good/Marginal Comms, RSL, SNR, LOS Only (no comms)
- Output Graphics:** Polygons, Grid
- Always Use Mainbeam Pointing:**

Check one or more radios to analyze. Select a radio or group of radios from the available radios list to set analysis parameters for those radios.

Radio Name	Transceiver	Band/Mode	TX Frequency	Power	Antenna
<input checked="" type="checkbox"/> Tower [ABAB]	Transceiver 1	UHF 2/Data	935.200000 M...	2.000000 W	ABAB PANI

Buttons: Check All, Uncheck All, Show Radio Info

Selected Radio Analysis Properties

- Calculation Radius: 5 MI
- Desired Fade Margin: 0 dB
- Azimuth Start: 0 degrees
- Transmitter Antenna Height: 6 FT
- Azimuth Stop: 360 degrees
- Transmitter Frequency: 935.20000 MHz
- Transmitter Power: 2.000000 W
- Analysis Interval: Coarse (100m)
- Analysis Radials: Fine (720 radials)
- Set Parameters For All Radios

Check zero or more jammers to apply at the receiver.

- AEA [CHAMELEON]

Buttons: Analyze, Cancel

The background map shows a coverage plot with a red dashed circle and a yellow/green shaded area. A green callout box points to the 'AEA [CHAMELEON]' checkbox.

Coverage plots can be generated on receivers to see the effectiveness of jammers on a target





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Receiver Plot cont...



The screenshot shows the EWIPS BETA software interface. The title bar reads "EWIPS BETA - LMR AEA to handhelds*". The interface includes a menu bar (Home, EW, Map, View, Other), a toolbar with various icons for system management and map interaction, and a main map area displaying a topographic map. A red dashed line represents the receiver coverage area, which is a circle centered on a blue target icon. A green jammer icon is positioned near the center of the coverage area. The left sidebar shows a tree view of objects, including Systems [2], Radio [1], Tower [ABAB], Jammer [1], AEA [CHAMELEON], Military Unit Groups, and Radio Nets. A green callout box points to the jammer icon with the text: "As the jammer moves closer to the target the receivers coverage is reduced forcing handheld devices to move closer to the receiver". The bottom status bar shows the date "2011 03185942 Z Aug 2011" and the text "UNCLASSIFIED//For Official Use Only".

As the jammer moves closer to the target the receivers coverage is reduced forcing handheld devices to move closer to the receiver





Unclassified CPOF Integration



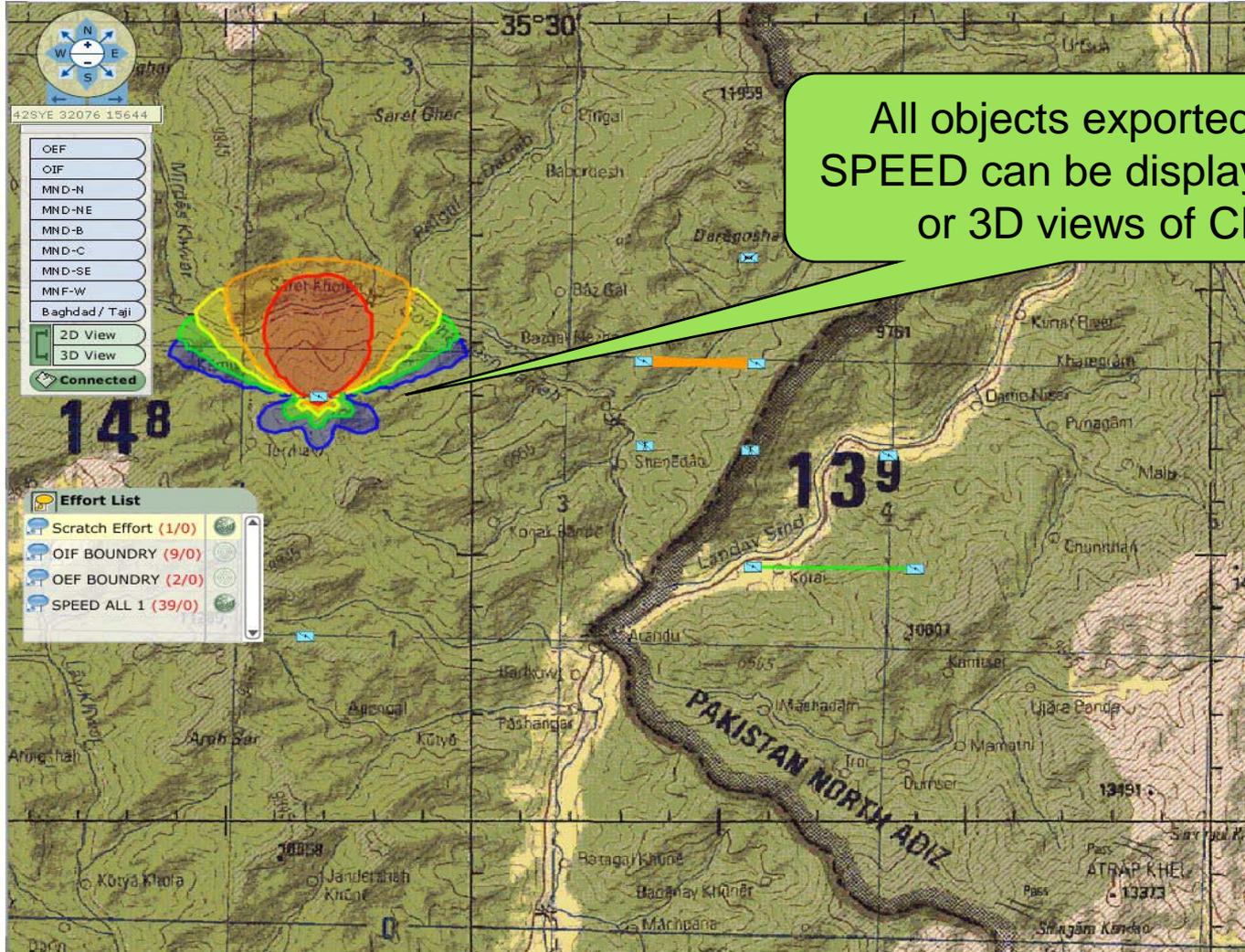
A screenshot of the SPEED BETA software interface. The main window displays a heatmap of a radar scan. A dialog box titled 'CPOF' is open, showing a warning icon and the message: 'Successfully published 'SPEED Analysis Graphics' containing 34 graphics to CPOF.' with an 'OK' button. The interface includes a menu bar (File, Edit, Objects, Nets, Analysis, Planning Tools, Map, View, Window, Help), a toolbar, and a Run Explorer panel on the left with sections for Objects, Search, Clear, Systems, Military Unit Groups (MilUnit0001, MilUnit0002), Analyses, Map Graphics, and User Messages. The status bar at the bottom shows coordinates and date: 'WGS 1984: Global Definition | 35 25 38.90N 071 23 42.52E | 425 YE 1743923085 | 12182026 Z May 2011 | 12182026 Z May 2011'. A green bar at the very bottom contains the text 'UNCLASSIFIED//For Official Use Only'. A green callout bubble points to the dialog box with the text: 'All analyses and graphics can be exported in CPOF.'





Unclassified

CPOF Integration cont...



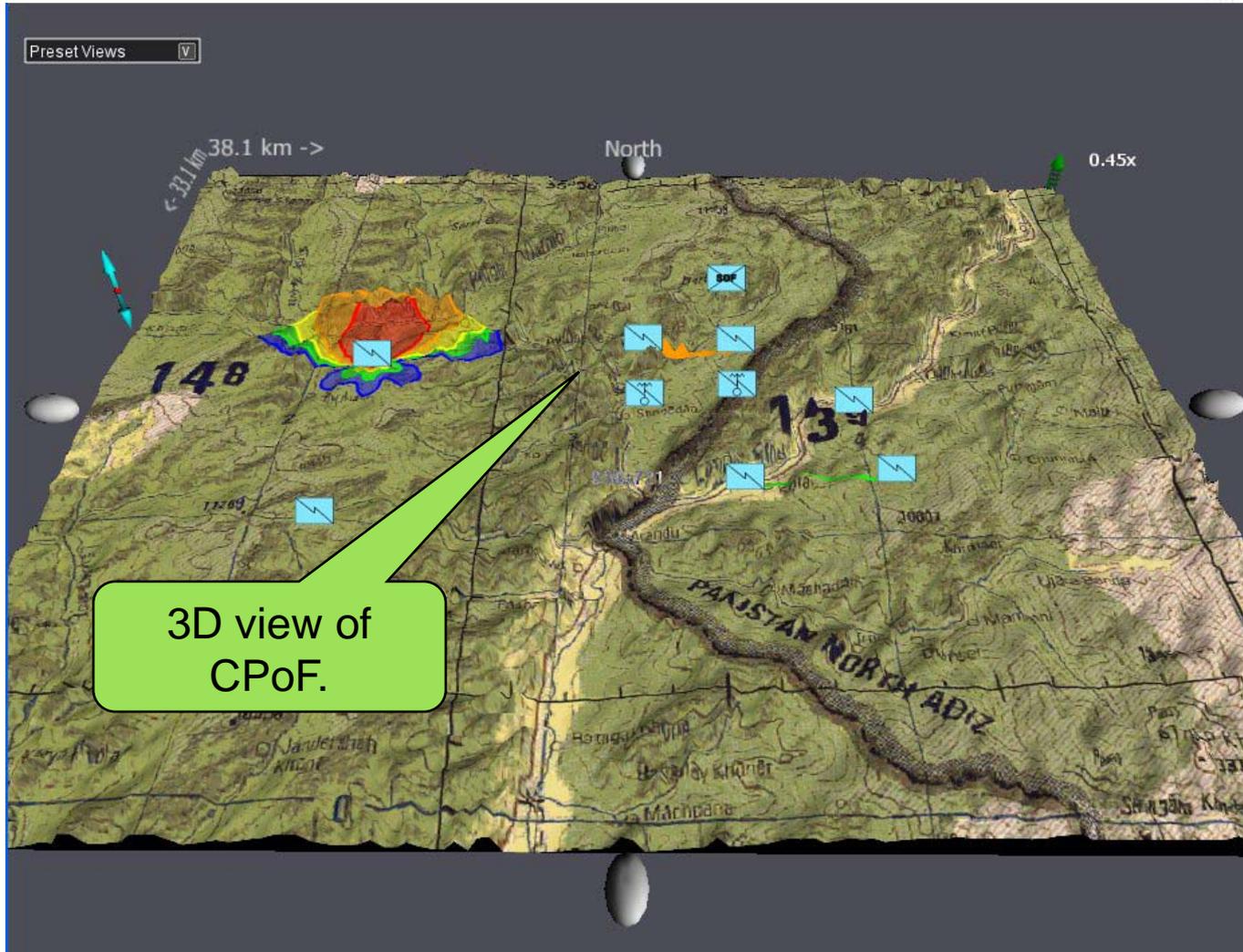
All objects exported out of SPEED can be displayed in 2D or 3D views of CPOF.





Unclassified

CPOF Integration cont...





Unclassified

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(407) 595-1031
- Help Desk (800) 808-7634
DSN: 365-0533
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Overview summary

- SPEED is a very powerful and proven tool that has been used extensively ISO Operation Enduring Freedom (OEF) in Afghanistan and Operation Iraqi Freedom (OIF) in Iraq.
- SPEED has supported numerous JTF's, 2 winter Olympics, the 2009 Presidential Inauguration, HA/DR efforts in support of Hurricane Katrina, Indonesia Tsunami, the Haiti Earthquake and the Earthquake and Tsunami that hit Japan.
- SPEED is a GOTS product that is free to DoD and all federal agencies. It is also available through the Foreign Military Sales (FMS) office.
- For software distribution contact the MCTSSA helpdesk at: 1-800-808-7634 or mctssasmbc4iscenter@usmc.mil to be added to the list.



Glossary

- **SFAF** (Standard Frequency Action Format)
- **JRFL** (Joint Restricted Frequency List)
- **NMCI** (Navy Marine Corps Intranet)
- **RF** (Radio Frequency)
- **COP** (Common Operational Picture)
- **C2PC** (Command and Control Personal Computer)
- **JTCW** (Joint Tactical COP Workstation)
- **MCEB** (Military Communications Electronics Board)
- **CRD** (Common Route Definition)
- **AKO** (Army Knowledge Online)
- **MTT** (Mobile Training Team)
- **BOLC** (Basic Officer Leader Course)
- **SCCC** (Signal Captains Career Course)
- **PRT** (Provisional Reconstruction Team)
- **S6** (Primary Staff Officers Course)
- **EWO** (Electronic Warfare Officer)
- **CTC** (Communications Training Center)
- **MCO** (Marine Corps Order)
- **ITU** (International Telecommunications Union)
- **SINR** (Signal to Interference plus Noise Ratio))
- **RSSI** (Receive Signal Strength Indicator)
- **ALE** (Automatic Link Establishment)
- **CREW** (Counter RCIED Electronic Warfare)
- **SNR w/SI** (Signal To Noise with Signal to Interference)
- **COTM** (Communications On The Move)
- **TACSAT** (Tactical Satellite)
- **JTF** (Joint Task Force)



Questions?

