

Space Strategies Center

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SSA-T

Space Situational Awareness Tools - Wargaming Capabilities -

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*“You may not be interested in war ...
but war is interested in you.”*
(Leon Trotsky)

SSA-T Purpose

- **Develop Space Warfare Theory, Doctrine, Strategies, Tactics, Techniques & Tools that Enable Informed Decision Making by Space Control Warfighters:**
 - Will Space Systems be Under Attack In the Near Future?
 - Are Space Systems Currently Under Attack?
 - Who Is Attacking?
 - What is the Adversary Attack Strategy?
 - What Damage Has Been Caused to Military Capabilities?
 - What Is Optimal Blue Military/Diplomatic/Economic Response?

**Provides a “Unified Field Theory” for
Space Situational Awareness (SSA) & Satellite Attack Warning (SAW)**

SSA-T Wargame Purpose

- **Develop Future Space Warfare Theory, Doctrine, Strategies, Tactics, and Techniques that Enable Informed Decision Making by Space Control Warfighters**
- **Train Space Warfighters to Recognize Covert Attacks on Space Systems**
- **Train Space Warfighters On How to Defend Their Space Assets**
- **Train Space Warfighters to Fight and Win Space Wars**
- **Determine Required Future Technologies for Offensive and Defensive Space Weapon Systems**
- **Develop Procedures, Forms, Documentation and Organizational Relationships to Fight and Win Space Wars**
- **Provides a Basic Space Warfare Command and Control System**
- **Provides Space Weapons Employment Optimization Tools**

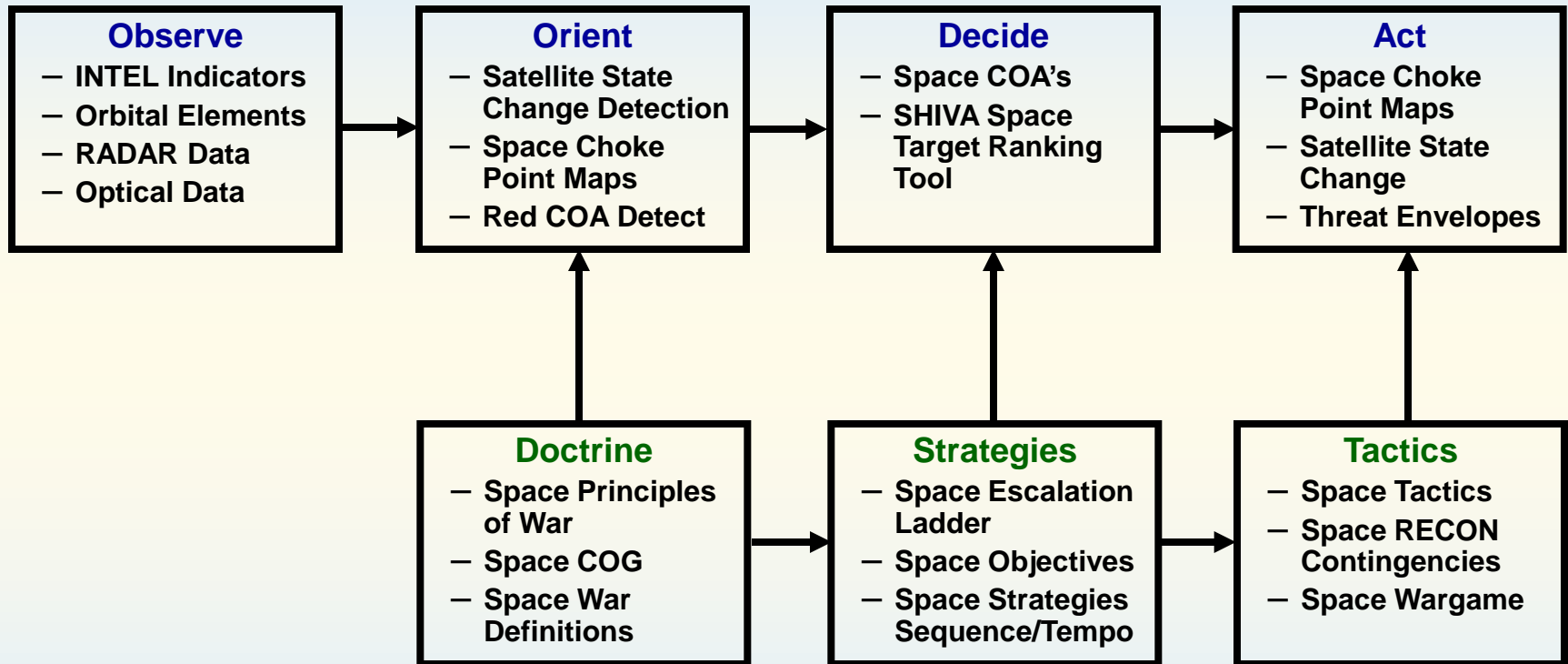
Space Wargame Trains our Future Space Warfighters

SSA-T Wargame Main Attributes

- **Realistic VS Typical Consumer Space Video Game**
- **Heavily Operational Orientated**
- **Unusually Detailed with All Aspects of Space Warfare:**
 - **Obscure Battlefield (Many Unknowns) with Sensor Tasking & Search Optimization Tools**
 - **Uncertainty (Random Within Bounds) Capabilities**
 - **Ground, Air, Sea and Space Current & Future Systems**
 - **Varied Phenomenology Space Weapons**
 - **Space Courses Of Action (COA's) Development Tools with Formatted Message Generation**
 - **Unique Space Attack Warning (SAW) Visualization Screens**

Most Complete Space Warfare Gaming Tools In Existence

SSA-T Process Flow



SSA-T Products Listed Inside Boxes

SSA-T Provides an Integrated Space Warfare Conceptual Framework

SSA-T Wargaming Process Flow (1)

- **Define / Review Future Space Warfare Terminology (Acronyms & Glossary)**
- **Define / Review Future Space Warfare Doctrine, Strategies, Tactics, Space Principles of War, Space Centers of Gravity, etc.**

Develop Space Warfare Basics

SSA-T Wargaming Process Flow (2)

- **Setup Wargame**

- **Define Country Alignments**

- Blue
- Red
- Gray

- **Define Areas of Responsibility (AOR's)**

- Terrestrial
- Orbital Regions

- **Set Country Space Budgets**

- Randomized Space Budgets Limit What Each Player Can Purchase In Space Systems & Weapons

Define Wargame Parameters

SSA-T Wargaming Process Flow (3)

- **Chose Notional Future Space Systems**
 - **Define Space Support Systems**
 - **COMM**
 - **Imagery**
 - **NAV**
 - **Terrestrial Space Systems**
 - **Ground Fixed/Mobile**
 - **Aircraft**
 - **Ship**
 - **Submarine**
 - **Define Space Weapon Systems**
 - **Terrestrial Weapons Directed Towards Space**
 - **Space-to-Space Weapons**
 - **Space-to-Earth Weapons**

Develop Space Systems Used In Wargame

SSA-T Wargaming Process Flow (4)

- **Randomize Notional Space Systems**
 - Randomize Military Value, Quantities, Costs, Characteristics, Locations, Orbits, Visibility to Red Sensors
 - Allows Randomized (Within User-Selected Min/Max Limits) Types, Quantities & Effectiveness for Those Systems Allocated by the computer to Each Side
- **Select & Randomize the Probability Players Can View Individual INTEL Reports on Opposing Side Activities**
- **Chose Real Space Systems**
 - Link Real Satellite Orbits (2 Line Element Sets) With Notional Future Satellites

Make Sure Game Play Has Random Factors Within User Defined Min-Max Limits

SSA-T Wargaming Process Flow (5)

- **Chose Military Events**
 - **Set Degree With Which Each Side Has a Probability of Viewing His Opponent's Activities**
 - **Randomize (Within User Selected Min-Max Bounds) Military Events & Probabilities of Being Viewed**

Determine Wargame Player Events

SSA-T Wargaming Process Flow (6)

- **Execute Wargame**

- Review Received Randomized INTEL Report Messages
- Detect / Determine / Assess Opposing Side Space Courses Of Action (COA's)
 - Task / Optimize Space Situational Awareness (SSA) Sensor Collection Strategies / Allocations
 - Review Historical Satellite Reliability & Natural Outages Probabilities
 - Review Historical Satellite Uncorrelated Target (UCT) Rates
 - Run SSA-T State Change Tools to Automatically Detect Adversary Satellite Attitude Changes & Orbital Maneuvers
 - Review & Assess Satellite Attack Warning (SAW) Orbital Situation Maps
- Develop Blue Space COA's & Military Objectives

Play Wargame

SSA-T Wargaming Process Flow (7)

- **Space Weaponizing Optimizations**
 - **Calculate All Possible Multiple Satellite Attacks Against Multiple Targets Within Military Objectives Time Constraints**
 - **Choose Those Satellite Attacks That Fulfill Military Objectives Within Rules Of Engagement (ROE) Constraints & Commander's Intent While Limiting Maneuvering Fuel Expended**
 - **Optimization Parameters:**
 - **Minimize Maneuvering Fuel**
 - **Minimize Transit Time**
 - **Minimize Sun Angles (Keep as Dark as Possible)**
 - **Maximize Overflights of Friendly Satellite Ground Stations / Sensors**
 - **Minimize Overflights of Adversary Satellite Ground Stations / Sensors**
 - **Align On-Target Times Within Military Objectives & Other Orbital Attacks (Maximize Shock Value & Overload Adversary Ground Controllers)**
 - **Assess Cost Exchange & Military Value Ratios**
 - **Assess Probabilities of Kill & Multiple Strike or Re-Strike Options**

Direct Wargame Weapons Fires

SSA-T Wargaming Process Flow (8)

- **Determine Weapons Effects, Conduct Additional Situational Assessment & Re-Target**

Determine Net Balance of Power in Space

Main SSA-T Screen Shots

Actual SSA-T Wargame Menus

Main SSA-T Menu

The screenshot shows a software application window titled "Space Situational Awareness Tools". The interface has a dark blue background with a grid of buttons. At the top, there is a navigation pane on the left and a menu bar with options: Home, Create, External Data, Database Tools, and Add-Ins. The main content area features a large yellow button labeled "Space Situational Awareness Tools". Below it, there are several smaller buttons arranged in a grid:

- Military Requirements (green border)
- View SATCAT / Manage SATCAT (blue border)
- Scenario Development (white border)
- Space IPB (white border)
- Current Situation Summary (red border)
- Space Wargames (white border)
- Space Acronyms (white border)
- Space Glossary (white border)
- Maintenance Data (white border)
- Satellite Failure Database (red border)
- LDEF Database (white border)
- Satellite Encounters (green border)
- About SSAT (white border)
- Exit (yellow border)
- Exercises (white border)

At the bottom of the window, there are three small colored buttons: OBT-1 (purple), JSTO-1 (blue), and COA-1 (green). The status bar at the very bottom shows "Review AFSC requirements and missions" on the left and "Num Lock" with system icons on the right.

Main SSA-T Overall Menu

Main SSA-T Wargaming Menu

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Space Wargames

Close

Exit

Setup Wargame

Export Wargame Data

War Room

Send INTEL Report Messages

Send INTEL Summary Messages

Send INTEL Tasking Messages

Send Selected Weapon Tasking

Standard Messages

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

Quick Access Menu

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0BT-1 JSTO-1 COA-1

View this data in spread sheet format

Num Lock

Gateway to User Setup & Execution Screens

Setup Space Wargame Menu

The screenshot shows the 'Space Games Setup' menu with the following steps:

- 1** Setup Scenario
- 2** Define Country Alignments
- 3** Country Space Budgets
- 4** Scenario Maps
- 5** Delineate AORs
- 6** Review Templates
- 7** Generate All Systems
- 8** Review All Systems
- 9** Setup COAs
- 10** Select Scenario Satellites
- 11** Additional Systems
- 12** Export Data
- A** Setup Scenario Parameters
- B** Select COA Events
- C** INTEL Report Messages, INTEL Summary Messages
- D** Sensor Tasking Messages, Weapon Tasking Messages

The 'View' window displays the following table:

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

Navigation Pane: UNCLASSIFIED

Status Bar: UNCLASSIFIED, OBT-1, JSTO-1, COA-1

Setup Space Wargame Before Game Execution

Designate Wargame Country Alignments

Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard Space Games Data Development Country Alignments

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Country Alignments

Delete Blue Countries Delete Gray Countries Delete Red Countries Add Rest To Gray Define Countries Assets Available Close STOP

New Find Delete		
INTEL	Blue Countries	Color
0.25	Australia	
0.25	British Indian Ocean Ter	
0.25	British Virgin Islands	
0.25	Callfon	Blue
0.25	Canada	
0.25	Idastan	LightCyan
0.25	Israel	
0.25	Johnston Atoll	
0.45	Kartuna	LightBlue
0.25	Midway Islands	
0.25	NATO	
0.35	Newmania	Cyan
0.25	Puerto Rico	
0.25	South Korea	

New Find Delete		
INTEL	Gray Countries	Color
0.25	Alghanistan	
0.25	Africa	
0.25	Aland Islands	
0.25	Albania	
0.25	Albanian Kosovars	
0.25	Alcatel Space	
0.25	Algeria	
0.25	American Samoa	
0.25	Andorra	
0.25	Angola	
0.25	Anguilla	
0.25	Antarctica	
0.25	Antigua & Barbuda	
0.25	APT	

New Find Delete		
INTEL	Red Countries	Color
0.25	Callfon	
0.15	Chican	Red
0.25	China	
0.25	China-Brazil	
0.25	CIS	
0.25	Cuba	
0.25	Gaza Strip	
0.25	Hong Kong	
0.75	Korona	LightCoral
0.25	Libya	
0.25	Mongolia	
0.25	Namibia	LightPink
0.25	Nebet	Firebrick
0.25	Newmex	DarkRed

Record: 1 of 19 No Filter Search

Record: 1 of 426 No Filter Search

Record: 1 of 25 No Filter Search

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

Recalculate Satellite Data

Select Size Categories

Micro
Nano
Pico
Femto

Record: 1 of 4

Print Satellite Data

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OBT-1 JSTO-1 COA-1

View this data in spreadsheet format

Num Lock

Designate Which Countries are Allied (Blue), Adversary (Red) or Neutral (Gray)

Set Country Space Budgets

Country Space Budgets

Record #	Record Date	Use	Scenario Name	Side	Country	Map Color	Name Syntax	Min	Budget (\$B) Baseline	Max	Comments
46	12/7/2013 9:46:40 AM	<input checked="" type="checkbox"/>	Operation Blue Thund	Blue	Califon	Cyan	Haiti	\$500 B	\$855 B	\$1,000 B	
48	12/7/2013 9:46:40 AM	<input checked="" type="checkbox"/>	Operation Blue Thund	Red	Newmex	DarkRed	Brazil	\$500 B	\$887 B	\$1,000 B	
47	12/7/2013 9:46:40 AM	<input checked="" type="checkbox"/>	Operation Blue Thund	Red	Orgonia	Red	Libya	\$500 B	\$767 B	\$1,000 B	
(New)	12/7/2013 1:08:31 PM	<input checked="" type="checkbox"/>						Zero	Zero	Zero	

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Crew Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

Country Names Used to Randomly Generate Space Systems Names From Geographic Features

Randomly Generated Country Space Budget Within User-Specified Min-Max Bounds. Space Budget Used to Buy Most Important Space Systems First, Then Next Most Important, Until Budget Runs Out

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Record: 1 of 3

OBT-1 JSTO-1 COA-1

View this data in spread sheet format

Num Lock

These Parameters Allow Random Game Play With Un-Equal Sides

View Situation Maps

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Maps, Charts and Graphics

Graphic Name: ACE 10 Scenario Overview - 1st Day | Category: ACE 10 | Record #: 31 | Use: | Record Date: 12/7/2013 7:55:31 AM | Scenario Name: Operation Blue Thund

LAT: 0 0 0 deg | Type: Map | LONG: 0 0 0 deg | Sub-Type: Situation

Comments: Exercise 1st Day - Blocks 1 and 2

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

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Record: 1 of 12 | No Filter | Search

OBT-1 | JSTO-1 | COA-1

What is the full System technical name

Num Lock

Terrestrial Game Maps

View Wargame Terrestrial Boundary Maps

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Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard Space Games Data Development Area Of Responsibility (AOR) Definitions

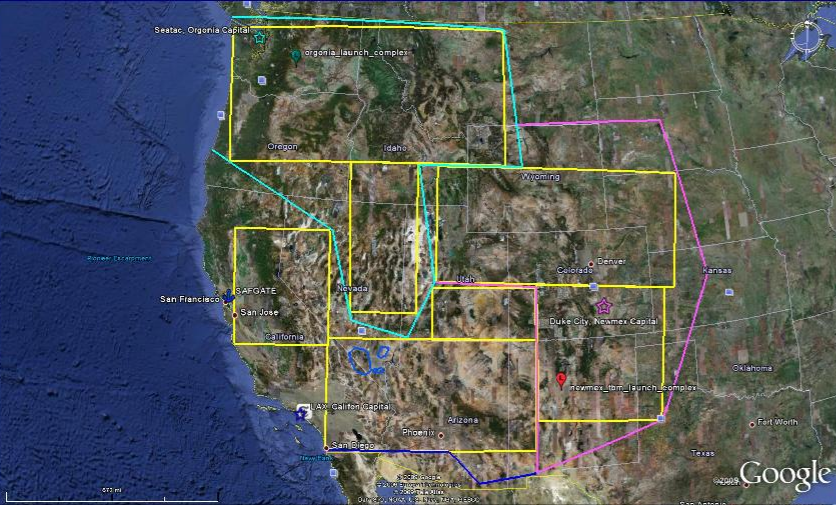
Area Of Responsibility (AOR) Definitions SATCAT SAW Duplicates Copy New Delete Find Close Exit

AOR Name: Category: Record #: Use: Min: Max: deg

Map Name: Type: Record Date: LAT: LONG: deg

Country: Sub-Type: Scenario Name: LONG: deg

Photo



SMA: km

Eccentricity:

Inclination: deg

RAAN: deg

ARG: deg

Anomaly: deg

Baseline

EPOCH-Year:

EPOCH-Month:

EPOCH-Day:

EPOCH-Hour:

EPOCH-Minute:

EPOCH-Seconds:

System Description

Comments

View

INTEL Msg:	<input type="text" value="Sheet"/>	<input type="text" value="Form"/>	Sen Task:	<input type="text" value="Sheet"/>	<input type="text" value="Form"/>
INTEL Sum:	<input type="text" value="Sheet"/>	<input type="text" value="Form"/>	Real Sys:	<input type="text" value="Sheet"/>	<input type="text" value="Form"/>
Red COA:	<input type="text" value="Sheet"/>	<input type="text" value="Form"/>	Exer Sys:	<input type="text" value="Sheet"/>	<input type="text" value="Form"/>
Blue COA:	<input type="text" value="Sheet"/>	<input type="text" value="Form"/>	Weapons:	<input type="text" value="Sheet"/>	<input type="text" value="Form"/>

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Records: 1 of 2 of 18 No Filter Search

OBT-1 JSTO-1 COA-1

View this data in spread sheet format

Num Lock

Terrestrial Game Areas Of Responsibility (AOR's)

View Wargame Space Boundary Maps (1)

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Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard Space Games Data Development Area Of Responsibility (AOR) Definitions

UNCLASSIFIED

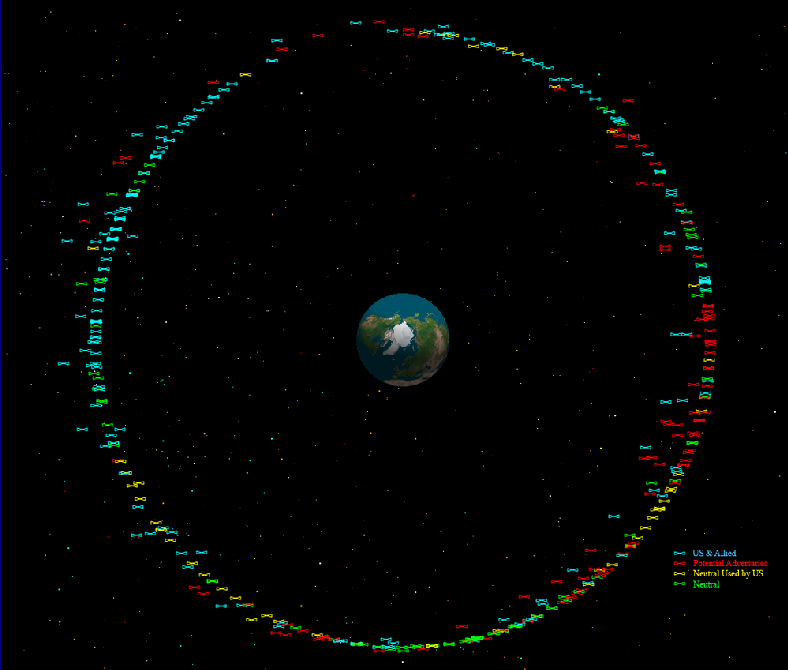
Area Of Responsibility (AOR) Definitions **SATCAT** **SAW** Duplicates Copy New Delete Find Close Exit

AOR Name: GEO Category: Space Record #: 50 Use: Min Max

Map Name: Geostationary Earth Orbit Type: Space Defense Area Record Date: 12/7/2013 9:46:40 AM LAT: 0 0 deg

Country: N/A Sub-Type: Scenario Name: Operation Blue Thunder LONG: 0 0 deg

Photo



UNCLASSIFIED

SMA: 42,160 42,170 km
 Eccentricity: 0.0000 0.0070
 Inclination: 0.0 5.0 deg
 RAAN: 0 359 deg
 ARG: 0 359 deg
 Anomaly: 0 359 deg

Baseline
 EPOCH-Year: 2008
 EPOCH-Month: 6
 EPOCH-Day: 1
 EPOCH-Hour: 0
 EPOCH-Minute: 0
 EPOCH-Seconds: 0.0000

System Description

Comments

UNCLASSIFIED

Record: 12 of 18 No Filter Search

OBT-1 JSTO-1 COA-1

What region of the Area Of Responsibility is this map or chart associated with

Num Lock

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

Space Orbital Divisions

View Wargame Space Boundary Maps (2)

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Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard Space Games Data Development Area Of Responsibility (AOR) Definitions

UNCLASSIFIED

Area Of Responsibility (AOR) Definitions **SATCAT** **SAW** **Duplicates** **Copy** **New** **Delete** **Find** **Close** **Exit**

AOR Name: GEO-Region US Category: Space Record #: 53 Use: Min Max

Map Name: Geostationary Earth Orbit-Space Defense Region United States Type: Space Defense Area Record Date: 12/7/2013 9:46:40 AM LAT: 0 90 deg

Country: N/A Sub-Type: Space Defense Region Scenario Name: Operation Blue Thunder LONG: 150 330 deg

Photo

Space Defense Region US Space Defense Region Europe Space Defense Region Middle East Space Defense Region Asia

System Parameters:

SMA	42,000	42,330	km
Eccentricity	0.0000	0.0070	
Inclination	0.0	5.0	deg
RAAN	0	359	deg
ARG	0	359	deg
Anomaly	0	359	deg

Baseline

EPOCH-Year: 2008

EPOCH-Month: 6

EPOCH-Day: 1

EPOCH-Hour: 0

EPOCH-Minute: 0

EPOCH-Seconds: 0.0000

System Description

Comments

UNCLASSIFIED

Record: 4 of 15 of 18 No Filter Search

OBT-1 JSTO-1 COA-1

What region of the Area Of Responsibility is this map or chart associated with

Num Lock

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

Space Orbital Regions for Geosynchronous Satellites

Wargame Notional Space Systems Development

Future Space Systems Employed in Wargame

Setup Notional Space Systems Randomized Characteristics (1)

Randomly Generated Space Systems Characteristics Within User-Specified Min-Max Bounds

Space Budget Used to Buy Most Important Space Systems First, Then Next Most Important, Until Budget Runs Out

Randomly Generate Space Systems Names From Real Country Geographic Features

Close to 600 Different Space Systems (Current & Future) Templates

Notional Space Systems (2)

Scenario Systems Templates

System Public Name: **LINK Fixed COMM**

System Name: **NV Large Ground Fixed Command-North** | Category: **Ground** | Record #: **2567** | Use: | Add: **Add** | AOR: **AOR**

Short / Formal Name: **NV_LGC_N** | al Marafiq | **RN** | Type: **Fixed** | Record Date: **4/22/2013 2:04:35 PM** | Korona-North

Links N/A | Sub-Type: **Command** | Scenario Name: **Operation Blue Thund** | ForestGreen

Country: **Nevidah** | NV90F22 | **BE Base** | INSTALLATION MILITARY | Icon:  | System Color: 

	Min	Baseline	Max
System Quantity	1	2	3
System Age	5	17	25
Procurement Priority	1.0	3.5	5.0
Military Value	5.0	5.7	10.0
Procurement Cost	\$1,000 M	\$2,452 M	\$5,000 M

IOE: **5** | **17** | **25** | **10** Is Best

Now | 10 Yr | 20 Yr | 30 yr | Highlight

Latitude: **37.6** | **38.6** | **38.8** deg | Mass: **0** | **0** | **0** kg

Longitude: **280.0** | **280.2** | **283.0** deg | SAT-Delta-V: **0** | **0** | **0** m/s

Altitude: **0** | **0** | **0** km | Launcher-Type: **N/A**

Max Range: **20,000** | **27,644** | **41,000** km | Launcher-Time: **0** | **0** | **0** hrs

Bandwidth-Space-Gnd: **C-Band** | Vulnerability-Hit: **0.50** | **0.71** | **0.80**

Bandwidth-Space-Space: **N/A** | Vulnerability-Laser: **0.60** | **0.67** | **0.70**

Bandwidth-TTC-Gnd: **S-Band** | Vulnerability-Jammer: **0.60** | **0.62** | **0.80**

Bandwidth-TTC-Space: **N/A** | Base: **Base** | Kill-Type: **N/A**

Survell Min Elev: **0**

Base	Min	Baseline	Max
Surveillance-RCS	0.0	0.0	0.0
Surveillance-Mag	0.0	0.0	0.0
Visibility to RF	0.00	0.00	0.00
Visibility to RCS	0.0	0.0	0.0
Visibility to Optical	0.00	0.00	0.00
Visibility to OCS	0.0	0.0	0.0

Indicator-1: **1** | Very large ground object is detected | **0.70** | **0.70** | **0.95** | Indicator 1 Probability of Detection

Indicator-2: **2** | Ground object has large RF antennas | **0.60** | **0.89** | **0.90** | Indicator 2 Probability of Detection

Indicator-3: **6** | Ground object is fixed | **0.50** | **0.89** | **0.90** | Indicator 3 Probability of Detection

Indicator-4: **3** | Ground object orienting itself towards space | **0.50** | **0.57** | **0.90** | Indicator 4 Probability of Detection

Indicator-5: **4** | Ground object has large power supply | **0.60** | **0.62** | **0.90** | Indicator 5 Probability of Detection

Indicator-6: **5** | Ground object is emanating high RF power | **0.60** | **0.76** | **0.95** | Indicator 6 Probability of Detection

Indicator-7: **7** | Ground object has considerable activity | **0.60** | **0.85** | **0.95** | Indicator 7 Probability of Detection

Indicator-8: **8** | SIGINT traffic indicates military space system | **0.10** | **0.51** | **0.80** | Indicator 8 Probability of Detection

Indicator-9: **0** | | **0.00** | **0.00** | **0.00** | Indicator 9 Probability of Detection

Indicator-10: **0** | | **0.00** | **0.00** | **0.00** | Indicator 10 Probability of Detection

System Description: **Large-sized fixed ground Command and Control Center for controlling space forces. Center is located in Northern region of AOR.**

Comments:

Weapon Effects: Power Structure Propulsion Antennas Thermal Optics Attitude Solar Panels COMINT TTSC LEO HED MEO Trans Lunar GEO Earth

Record: **15** of 584 | Unfiltered | Search

OBT-1 | JSTO-1 | COA-1

Picture & Mil-Standard Map Symbol Used for Each Future Notional Space-Related (Terrestrial & Space) Systems

Notional Pictures for Each Space System

Notional Space Systems (3)

Scenario Systems Templates

System Public Name: UNK Facility

System Name: NV Large Ground Laser ASAT-South

Short / Formal Name: NV_LGL_S

System Quantity Table:

	Min	Baseline	Max
System Quantity	3	5	6
System Age	5	11	15

Randomly Generated Space Systems Quantities Within User-Specified Min-Max Bounds

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

System Description: Large-sized fixed ground high-power laser weapon system for attacking satellites in Southern region of AOR.

Weapon Effects:

- Power
- Structure
- Propulsion
- Antennas
- Thermal
- Optics
- Attitude
- Solar Panels
- COM
- TTNC
- LEO
- HED
- MEO
- Trans Lunar
- GEO
- Earth

Capabilities & Locations of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (4)

Scenario Systems Templates

System Public Name: UNLINK Ground Vehicle

System Name: NV Mobile Laser Blinder-North

Short / Formal Name: NV_MLB_N

Category: Ground

Type: ASAT

Record #: 2685

Record Date: 4/22/2013 2:04:35 PM

Scenario Name: Operation Blue Thund

System Color: DarkYellow

	Min	Baseline	Max
Procurement Priority	4.0	7.7	8.0
Military Value	3.0	4.4	7.0
Procurement Cost	\$10M	\$47M	\$50M

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

Randomly Generated Space Systems INTEL Indicators Probability of Detection Values Within User-Specified Min-Max Bounds

Indicator	Rank	Description	Min	Baseline	Max
Indicator-1	1	Small ground vehicle is detected	0.70	0.82	0.95
Indicator-2	2	Ground object has large optical system	0.60	0.94	0.90
Indicator-3	6	Ground object is mobile	0.50	0.55	0.90
Indicator-4	3	Ground object orienting optical system towards space	0.50	0.71	0.90
Indicator-5	4	Ground object has large power supply	0.60	0.87	0.90
Indicator-6	5	Ground object is emanating high optical power	0.60	0.61	0.95
Indicator-7	7	SIGINT traffic indicates military space system	0.10	0.14	0.80
Indicator-8	0		0.00	0.00	0.00
Indicator-9	0		0.00	0.00	0.00
Indicator-10	0		0.00	0.00	0.00

Visibilities to Sensors of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (5)

The screenshot displays the 'Scenario Systems Templates' application window. The interface includes a menu bar, a toolbar with buttons like 'Randomize', 'Update AOR', and 'Systems', and a main data entry area. The system being configured is 'LVNK Mobile Missile Launcher'. The data is organized into several sections:

- System Information:** System Name, Short/Formal Name, Category, Record #, Record Date, Location, and Country.
- Performance Metrics:** A table with columns for 'Min', 'Baseline', and 'Max' values for various parameters like System Quantity, Military Value, and Procurement Cost.
- Physical Characteristics:** Parameters such as System Age, LAT, Long, Altitude, and Max Range.
- Operational Parameters:** Values for Bandwidth, Vulnerability, and various 'Kill' types.
- Indicators:** A list of 10 indicators with associated probability values color-coded from red (low) to green (high).
- Weapon Effects:** A checklist for various capabilities like Power, Structure, Antennas, etc.

Yellow arrows point from text boxes to specific elements: one points to the '20 Yr' system age selection, another points to the '20 Yr' column in the performance metrics table, and a third points to the '0.95' value in the 'Indicator 4' row.

Users Can Select Only Those Space Systems Available by Some Future Date

Colors Indicate Range of Values

Space Systems Capabilities Color-Coded for Instant Recognition

Notional Space Systems (6)

Scenario Systems Templates

System Public Name: UNLK Fixed COMM

System Name: NV Large Ground Sens (What is the System name that is publically known during the game that may obscure the true functionality and mission of the satellite (this value must be manually entered by the user))

Short / Formal Name: NV_LSG_N

Country: Nevidah

System Age: 15

System Quantity: 5

System Description: Large-sized fixed ground mechanical RADAR for space surveillance in Northern region of ACR.

	Min	Baseline	Max
Procurement Priority	4.0	4.9	8.0
Military Value	5.0	6.2	7.0
Procurement Cost	\$100 M	\$182 M	\$500 M
Mass	0	0	0
SAT-Delta-V	0	0	0
Launcher-Type	N/A		
Launcher-Time	0	0	0
Satellite-Time	0.0	0	0
Vulnerability-FH	0.50	0.69	0.80
Vulnerability-Laser	0.60	0.69	0.70
Vulnerability-Jammer	0.60	0.61	0.80
Surveillance-RCS	0.0	0.0	0.0
Surveillance-Mag	0.0	0.0	0.0
Visibility to RF	0.00	0.00	0.00
Visibility-RCS	0.0	0.0	0.0
Visibility to Optical	0.00	0.00	0.00
Visibility-OCS	0.0	0.0	0.0

Indicator	Description	Min	Baseline	Max
Indicator-1	Very large ground object is detected	0.70	0.85	0.95
Indicator-2	Ground object has large RF antenna	0.60	0.86	0.90
Indicator-3	Ground object is fixed	0.50	0.72	0.90
Indicator-4	Ground object orienting itself towards space	0.50	0.88	0.90
Indicator-5	Ground object has large power supply	0.60	0.83	0.90
Indicator-6	Ground object is emanating high RF power	0.60	0.86	0.95
Indicator-7	SIGINT traffic indicates military space system	0.10	0.15	0.60
Indicator-8	Indicator 8 Probability of Detection	0.00	0.00	0.00
Indicator-9	Indicator 9 Probability of Detection	0.00	0.00	0.00
Indicator-10	Indicator 10 Probability of Detection	0.00	0.00	0.00

Comments

Weapon Effects

- Power
- Propulsion
- Thermal
- Attitude
- COMINT
- LEO
- MEO
- GEO
- Structure
- Antennas
- Optics
- Solar Panels
- TTSC
- HED
- Trans Lunar
- Earth

UNCLASSIFIED

OBT-1 JSTO-1 COA-1

Some Space Systems (Terrestrial & Orbital) Randomly Obscured to Other Side

Notional Space Systems (7)

Scenario Systems Templates

System Public Name: UNK Facility

System Name: NV Space Research Facility-North | Category: Ground | Record #: 2702

Short / Formal Name: NV_SRF_N | ad Darbadah | RIN | Type: Facility | Record Date: 4/22/2013 2:04:35 PM | Korona-North

Country: Nevidah | NV90F32 | BE Base | INSTALLATION MISSILE

	Min	Baseline	Max
System Quantity	1	1	5
Procurement Priority	3.0	5.3	8.0
Military Value	5.0	5.4	8.0

	Min	Baseline	Max
System Age	5	13	5
LAT	37.6	33.1	38.8
LONG	280.0	277.8	283.0
Altitude	0	0	0
Max Range	200	570	1,000

	Min	Baseline	Max
Vulnerability-Fit	0.60	0.75	0.80
Vulnerability-Laser	0.60	0.61	0.70
Vulnerability-Jammer	0.60	0.60	0.80

	Min	Baseline	Max
Surveillance-RCS	0.0	0.0	0.0
Surveillance-Mag	0.0	0.0	0.0
Visibility to RF	0.00	0.00	0.00
Visibility-RCS	0.0	0.0	0.0
Visibility to Optical	0.00	0.00	0.00
Visibility-OCS	0.0	0.0	0.0

Rank	Indicator	Min	Baseline	Max
1	Very large ground facility is detected	0.70	0.90	0.95
2	Facility has extensive space infrastructure	0.60	0.94	0.90
4	Highly educated employees	0.50	0.67	0.90
3	Facility work oriented towards space technologies	0.50	0.68	0.90
5	SIGINT traffic indicates military space facility	0.40	0.70	0.80
0		0.00	0.00	0.00
0		0.00	0.00	0.00
0		0.00	0.00	0.00
0		0.00	0.00	0.00
0		0.00	0.00	0.00
0		0.00	0.00	0.00
0		0.00	0.00	0.00

System Description: Large military facility that researches new space technologies. Facility is in Northern region of AOR.

Weapon Effects: Power, Structure, Propulsion, Antennas, Thermal, Optics, Altitude, Solar Panels, COMINT, TTSC, LEO, HED, MED, Trans Lunar, GEO, Earth

Record: 14 of 584 | Unfiltered | Search

UNCLASSIFIED

OBT-1 | JSTO-1 | COA-1

Quantities of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (8)

Scenario Systems Templates

System Public Name: UNK Large Satellite

System Name: CA Large GEO Inspector Satellite

Short / Formal Name: CA_LIS_G

Location: CA LIS_L

Country: Californ

Category: Satellite

Type: Large Satellite

Record #: 2323

Record Date: 4/19/2013 2:04:35 PM

Scenario Name: Operation Blue Thund

System Color: PowderBlue

Min Detect: 5.0%

On/Off: On

Buttons: Randomize, Update AOR, Systems, Min Detect, Copy, New, Delete, Find, Close, Exit

System Quantity	Min	Baseline	Max	Procurement Priority	Min	Baseline	Max	1 Is Best
3	3	3	6	2.0	3.3	5.0		

Overall priority of this system for procurement on a scale of 1 to 10, one being the highest priority

System Age	Min	Baseline	Max	Military Value	Min	Baseline	Max
3	3	4	5	4.0	5.4		

Procurement Cost: \$100 M, \$193 M, \$300 M

System Age	Min	Baseline	Max	Mass	Min	Baseline	Max
0.0	0.0	0.0	0.0	100	739	1,000	

Procurement Cost: \$100 M, \$193 M, \$300 M

System Age	Min	Baseline	Max	SAT-Delta-V	Min	Baseline	Max
0.0	0.0	0.0	0.0	1,500	2,307	4,000	

Launcher-Type: N/A

System Age	Min	Baseline	Max	Launcher-Time	Min	Baseline	Max
0	0	0	0	6	8	12	

Satellite-Time: 48.0, 96, 72 hrs

System Age	Min	Baseline	Max	Vulnerability-Fit	Min	Baseline	Max
0	0	0	0	0.50	0.64	0.99	

Vulnerability-Laser: 0.60, 0.75, 0.80

Vulnerability-Jammer: 0.60, 0.73, 0.80

Base Kill-Type: Ram

System Age	Min	Baseline	Max	Kill-Pk-Permanent	Min	Baseline	Max
0.0	0.0	0.0	0.0	0.00	0.00	0.00	

Kill-Pk-Temporary: 0.00, 0.00, 0.00

Kill-Temporary-Time: 0, 0, 0 hrs

Kill-Power: 0, 0, 0 watt

Kill-Shots: 0, 0, 0

Kill-Time: 0, 0, 0 sec

Survival Min Elev: 0

System Age	Min	Baseline	Max	Surveillance-RCS	Min	Baseline	Max
0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Surveillance-Mag: 0.0, 0.0, 0.0

Visibility to RF: 0.50, 0.79, 0.80

Visibility-RCS: 10.0, 38.3, 50.0 dbm

Visibility to Optical: 0.50, 0.72, 0.80

Visibility-OCS: 8.0, 10.9, 12.0 mag

Rank: 5

Indicator-1: Large space object is detected (0.50, 0.56, 0.80)

Indicator-2: Space object has very large optical payload system on-board (0.60, 0.51, 0.90)

Indicator-3: Space object is maneuvering a lot (0.50, 0.70, 0.80)

Indicator-4: Space object is conducting RPO's against high-value space assets (0.50, 0.57, 0.80)

Indicator-5: Space object orienting itself towards high-value space assets (0.60, 0.66, 0.90)

Indicator-6: Space object is changing attitude (0.60, 0.85, 0.90)

Indicator-7: SIGINT traffic indicates military space system (0.10, 0.20, 0.80)

Indicator-8: 0 (0.00, 0.00, 0.00)

Indicator-9: 0 (0.00, 0.00, 0.00)

Indicator-10: 0 (0.00, 0.00, 0.00)

Indicator 1 Probability of Detection

Indicator 2 Probability of Detection

Indicator 3 Probability of Detection

Indicator 4 Probability of Detection

Indicator 5 Probability of Detection

Indicator 6 Probability of Detection

Indicator 7 Probability of Detection

Indicator 8 Probability of Detection

Indicator 9 Probability of Detection

Indicator 10 Probability of Detection

System Description: Large-sized inspector satellite with optical and electronic sensors that maneuvers near a target satellite to determine its true purpose and missions.

Weapon Effects: Power, Propulsion, Thermal, Altitude, COMINT, LEO, MED, GEO, Structure, Antennas, Optics, Solar Panels, TTSC, HED, Trans Lunar, Earth

Comments

UNCLASSIFIED

Record: 1 of 45 of 584

Buttons: OBT-1, JSTO-1, COA-1

What is the System name that is publically known during the game that may also obscure the true functionality and mission of the satellite (this v...

Priorities & Military Value of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (9)

Scenario Systems Templates

System Public Name: UNK Large Satellite

System Name: CA Large LEO Mine Carrier

Short / Formal Name: CA_LMC_L

Location: CA90F09

System Quantity: 2

System Age: 5

System Color: Red

Min Baseline Max

Min	Baseline	Max
3.0	4.8	7.0
4.0	5.8	8.0
2,000	2,654	3,200
1,500	2,632	
0.50	0.89	0.99
0.60	0.65	0.80
0.60	0.72	0.80
0.00	0.00	0.00
0.00	0.00	0.00
0.70	0.82	0.95
1.0	23.2	30.0
0.50	0.78	0.80
3.0	8.3	12.0
0.60	0.62	0.95
0.60	0.66	0.90
0.50	0.55	0.90
0.50	0.74	0.90
0.60	0.65	0.90
0.10	0.39	0.80
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00
0.00	0.00	0.00

Indicator 1: 5 Space object has small solar arrays

Indicator 2: 1 Space object has small antennas on-board

Indicator 3: 4 Space object is maneuvering a lot

Indicator 4: 2 Space object is maneuvering near High Value Assets

Indicator 5: 3 Space object not in public space catalog

Indicator 6: 6 SIGINT traffic indicates military space system

Indicator 7: 0

Indicator 8: 0

Indicator 9: 0

Indicator 10: 0

Indicator 1 Probability of Detection

Indicator 2 Probability of Detection

Indicator 3 Probability of Detection

Indicator 4 Probability of Detection

Indicator 5 Probability of Detection

Indicator 6 Probability of Detection

Indicator 7 Probability of Detection

Indicator 8 Probability of Detection

Indicator 9 Probability of Detection

Indicator 10 Probability of Detection

Weapon Effects

- Power
- Propulsion
- Thermal
- Attitude
- CDM
- LEO
- MEO
- GEO
- Structure
- Antennas
- Optics
- Solar Panels
- TTSC
- HED
- Trans Lunar
- Earth

System Description: Large-sized mine dispenser mother ship at geostationary orbit.

Comments

UNCLASSIFIED

Record: 1 of 52 of 584

UNCLASSIFIED

OBT-1 JSTO-1 COA-1

What is the System name that is publically known during the game that may also obscure the true functionality and mission of the satellite (this v...

Capabilities of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (10)

Scenario Systems Templates

System Public Name: UNK Nano Satellite

System Name: CA Nano GEO Mine-Shrapnel

Short / Formal Name: CA_NMS_G_5

System Quantity: 10

System Age: 1

System Color: Red

System Description: Nano-sized space mine with optical and electronic sensors that maneuvers close to a target satellite, then detonates a pellet shrapnel cloud.

Min	Baseline	Max
5.0	5.3	8.0
3.0	5.2	6.0
\$1 M	\$2 M	\$5 M
1	2	10
50	105	300
0.80	0.92	0.99
0.70	0.83	0.85
0.70	0.71	0.90
0.10	0.10	0.10
0.05	0.08	0.30
0.05	0.05	0.5
0.05	0.20	0.50
16.0	19.5	22.0
0.10	0.22	0.40
0.60	0.25	0.90
0.50	0.69	0.80
0.60	0.78	0.90
0.60	0.85	0.90
0.10	0.22	0.40
0.00	0.00	0.00
0.00	0.00	0.00

Indicator 1 Probability of Detection: 0.10

Indicator 2 Probability of Detection: 0.25

Indicator 3 Probability of Detection: 0.69

Indicator 4 Probability of Detection: 0.60

Indicator 5 Probability of Detection: 0.78

Indicator 6 Probability of Detection: 0.85

Indicator 7 Probability of Detection: 0.10

Indicator 8 Probability of Detection: 0.22

Indicator 9 Probability of Detection: 0.00

Indicator 10 Probability of Detection: 0.00

Weapon Effects: Power, Propulsion, Thermal, Altitude, COMINT, LEO, MEO, GEO, Structure, Antennas, Optics, Solar Panels, TTSC, HED, Trans Lunar, Earth

Probability of Kill (Pk) of Space Weapons Randomized

Notional Space Systems (11)

Scenario Systems Templates

System Public Name: UNK Nano Satellite

System Name: CA Nano LEO Mine-Paint

Short / Formal Name: CA_NMS_L_P

Location: CA90F09

Category: Satellite

Type: Nano Satellite

Record #: 2342

Record Date: 4/19/2013 2:04:35 PM

System Color: Red

Scenario Name: Operation Blue Thund

System Color: Red

	Min	Baseline	Max
System Quantity	10	15	50
System Age	1	3	3
Procurement Cost	\$1M	\$4M	\$5M
Procurement Priority	5.0	7.5	8.0
Military Value	3.0	3.9	6.0
Mass	1	8	10
SAT-Delta-V	50	100	300
Launcher-Type	N/A		
Launcher-Time	3	6	12
Satellite-Time	3.0	9	24
Vulnerability-Fit	0.80	0.93	0.99
Vulnerability-Laser	0.70	0.73	0.85
Vulnerability-Jammer	0.70	0.70	0.90
Base Kill-Type	Paint		
Kill-Pk-Permanent	0.10	0.13	0.30
Kill-Pk-Temporary	0.50	0.76	0.85
Kill-Temporary-Time	24	57	72
Kill-Power	0	0	0
Kill-Shots	1	1	1
Kill-Time	1,200	3,073	3,600
Indicator 1	5	0.10	0.18
Indicator 2	4	0.50	0.90
Indicator 3	3	0.50	0.80
Indicator 4	1	0.50	0.80
Indicator 5	2	0.60	0.90
Indicator 6	6	0.60	0.90
Indicator 7	7	0.10	0.15
Indicator 8	8	0.10	0.50
Indicator 9	0	0.00	0.00
Indicator 10	0	0.00	0.00

System Description: Nano-sized space mine with optical and electronic sensors that maneuvers close to a target satellite, then paints its solar cells, optics and radiators with a UV solvent that disappears in 24 hours, but temporarily disables the satellite.

Weapon Effects:

- Power
- Propulsion
- Thermal
- Attitude
- COMINT
- LEO
- MEO
- GEO
- Structure
- Antennas
- Optics
- Solar Panels
- TTSC
- HED
- Trans Lunar
- Earth

Intel Tools: INTEL Msg, INTEL Sum, Red COA, Blue COA, Sen Task, Real Sys, Exer Sys, Weapons

Navigation Pane: Home, Create, External Data, Database Tools, Add-Ins

Record: 1 of 59 of 584

Intelligence Indicators Identifying Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (12)

Scenario Systems Templates

System Public Name: UNLK Very Large Satellite

System Name: CA Large GEO Battle Station

Short / Formal Name: CA_LBS_G

System Quantity: 1

System Age: 15

System Color: DarkRed

System Description: Large-sized un-manned automated Battle Station at geosynchronous orbit. Includes SIGINT, optical and RADAR sensors. Has kinetic kill, jammers, laser blinders and inspector sub-satellites.

	Min	Baseline	Max
Procurement Priority	1.0	2.2	3.0
Military Value	\$0	\$8.8	\$10.0
Procurement Cost	\$10,000 M	\$17,480 M	\$20,000 M
Mass	10,000 kg	25,752 kg	30,000 kg
SAT-Delta-V	3,000 deg	7,173 deg	8,000 deg
Launcher-Type	N/A	N/A	N/A
Launcher-Time	10 hrs	17 hrs	24 hrs
Satellite-Time	168.0 hrs	346 hrs	672 hrs
Vulnerability-Fit	0.50	0.66	0.80
Vulnerability-Laser	0.60	0.60	0.70
Vulnerability-Jammer	0.60	0.79	0.80
Survivability	1.0	3.4	5.0
Kill-Pk-Permanent	0.50	0.65	0.80
Kill-Pk-Temporary	0.50	0.50	0.80
Kill-Temporary-Time	24 hrs	60 hrs	72 hrs
Kill-Power	2,000 watt	2,370 watt	20,000 watt
Kill-Shots	3	42	120
Kill-Time	10 sec	11 sec	50 sec

Indicator	Rank	Description	Min	Baseline	Max
Indicator-1	1	Very large space object is detected	0.70	0.95	0.95
Indicator-2	2	Space object has large optical payload system on-board	0.60	0.60	0.60
Indicator-3	6	Space object is maneuvering a lot	0.50	0.62	0.90
Indicator-4	3	Space object orienting itself towards the Earth	0.50	0.88	0.90
Indicator-5	4	Space object is not changing attitude	0.60	0.83	0.90
Indicator-6	5	Space object in geosynchronous orbit	0.60	0.79	0.95
Indicator-7	7	Space object not in public space catalog	0.80	0.83	0.99
Indicator-8	8	SIGINT traffic indicates military space system	0.10	0.42	0.80
Indicator-9	0		0.00	0.00	0.00
Indicator-10	0		0.00	0.00	0.00

Weapon Effects:

- Power
- Propulsion
- Thermal
- Attitude
- COMINT
- LEO
- MEO
- GEO
- Structure
- Antennas
- Optics
- Solar Panels
- TTNC
- HED
- Trans Lunar
- Earth

UNCLASSIFIED

Record: 1 of 60 of 584

What is the System name that is publically known during the game that may also obscure the true functionality and mission of the satellite (this v...

Intelligence Indicators Probabilities Are Randomized

Notional Space Systems (13)

Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard Space Games Data Development Scenario Systems Form Properties

Scenario Systems Templates

UNCLASSIFIED Randomize Update AOR Systems Min Detect 5.0% Copy New Delete Find Close Exit

Names Duplicates SATCAT On Off

System Public Name: UNK Large Satellite

System Name: CA Large LEO Laser ASAT Category: Satellite Record #: 2346 Use Add Add AOR

Short / Formal Name: CA_LLS_L Price: RIN Type: Large Satellite Record Date: 4/19/2013 2:04:35 PM LEO

Links: N/A Sub-Type: Laser Scenario Name: Operation Blue Thunder MediumVioletRed

Country: Californ CA90F11 BE Base Satellite ASAT-DE-Frie Icon Model System Color

	Min	Baseline	Max
System Quantity	2	3	6
System Age	5	13	15
Procurement Priority	2.0	3.4	5.0
Military Value	4.0	8.0	9.0
Procurement Cost	\$1,000 M	\$2,205 M	\$3,000 M

	Min	Baseline	Max
Mass	2,000	2,950	3,200
SAT-Delta-V	1,500	1,736	3,000
Launcher-Type	N/A		
Launcher-Time	10	18	24
Satellite-Time	72.0	142	336

	Min	Baseline	Max
Vulnerability-Fit	0.50	0.74	0.99
Vulnerability-Laser	0.60	0.67	0.80
Vulnerability-Jammer	0.60	0.78	0.80

	Min	Baseline	Max
Kill-Pk-Permanent	0.50	0.68	0.80
Kill-Pk-Temporary	0.50	0.68	0.80
Kill-Temporary-Time	24	31	72
Kill-Power	2,000	7,719	20,000
Kill-Shots	3	15	15
Kill-Time	10	39	50

System Description: This system is a weapon, what is its weapon power level (watts for lasers or jammers)?

Comments

Weapon Effects:

- Power
- Propulsion
- Thermal
- Altitude
- COMINT
- LEO
- MEO
- GEO
- Structure
- Antennas
- Optics
- Solar Panels
- TTSC
- HED
- Trans Lunar
- Earth

Indicator 1: 5 Space object has small solar arrays 0.60 0.81 0.95 Indicator 1 Probability of Detection

Indicator 2: 1 Space object has small antennas on-board 0.60 0.69 0.90 Indicator 2 Probability of Detection

Indicator 3: 4 Space object is maneuvering a lot 0.50 0.80 0.90 Indicator 3 Probability of Detection

Indicator 4: 2 Space object is maneuvering near High Value Assets 0.50 0.75 0.90 Indicator 4 Probability of Detection

Indicator 5: 3 Space object not in public space catalog 0.60 0.78 0.90 Indicator 5 Probability of Detection

Indicator 6: 6 Large space object is detected 0.60 0.65 0.90 Indicator 6 Probability of Detection

Indicator 7: 7 SIGINT traffic indicates military space system 0.10 0.53 0.80 Indicator 7 Probability of Detection

Indicator 8: 0 Indicator 8 Probability of Detection

Indicator 9: 0 Indicator 9 Probability of Detection

Indicator 10: 0 Indicator 10 Probability of Detection

UNCLASSIFIED

Record: 1 of 62 of 584 Unfiltered Search

OBT-1 JSTO-1 COA-1

What is the full System technical name

Num Lock

Space Weapon Systems (Terrestrial & Orbital) Characteristics Randomized

Notional Space Systems (14)

The screenshot displays the 'Scenario Systems Templates' application window. The main interface is titled 'UNCLASSIFIED' and shows a detailed configuration for a system named 'UNK Missile Launch Site'. The system is categorized as 'Ground' and is a 'Space Launch' vehicle. Key parameters include a procurement cost of \$2,000 M, a mass of 0 kg, and a maximum range of 40,783 km. The interface is organized into several sections: a top navigation bar, a main parameter grid with 'Min', 'Baseline', and 'Max' columns, a 'System Description' text box, and a 'Comments' section at the bottom. A 'View' dialog box is open on the right, showing a grid of system types like 'INTEL Msg', 'Sen Task', 'Real Sys', etc. The bottom status bar shows 'Record: 1 of 63 of 584' and 'Unfiltered Search'.

System Name	CA Space Launch Site-South	Category	Ground	Record #	2387	Use	<input checked="" type="checkbox"/>	Add	Add	AOR
Short / Formal Name	CA_SLG_S	La Petite Anse	RN	Type	Space Launch	Record Date	4/19/2013 2:04:35 PM	Califon-South		
Country	Califon	CA90F12	BE Base	Sub-Type	SPACE LAUNCH VEHIC	Icon		Model		System Color
System Quantity	1	2	3	Procurement Priority	3.0	5.1	6.0	1 Is Best		
System Age	5	8	30	Military Value	5.0	6.6	8.0	10 Is Best		
Procurement Cost	\$2,000 M	\$15,337 M	\$20,000 M	Procurement Cost	\$2,000 M	\$15,337 M	\$20,000 M			
LAT	34.0	35.8	37.0	deg	Mass	0	0	0	kg	
LONG	242.9	249.9	252.1	deg	SAT-Delta-V	0	0	0	m/s	
Altitude	0	0	0	deg	Launcher-Time	0	0	0	hrs	
Max Range	200	40,783	41,000	km	Satellite-Time	0.0	0.0	0.0	hrs	
Bandwidth-Space-Gnd	N/A	N/A	N/A	Vulnerability-FH	0.60	0.65	0.80			
Bandwidth-Space-Space	N/A	N/A	N/A	Vulnerability-Laser	0.60	0.67	0.70			
Bandwidth-TTC-Gnd	N/A	N/A	N/A	Vulnerability-Jammer	0.60	0.60	0.80			
Bandwidth-TTC-Space	N/A	N/A	N/A	Base Kill-Type	N/A	N/A	N/A			
Surveillance-RCS	0.0	0.0	0.0	Kill-Pk-Permanent	0.00	0.00	0.00			
Surveillance-Mag	0.0	0.0	0.0	Kill-Pk-Temporary	0.00	0.00	0.00			
Visibility to RF	0.00	0.00	0.00	Kill-Temporary-Time	0	0	0	hrs		
Visibility-RCS	0.0	0.0	0.0	dBsm	Kill-Power	0	0	0	watt	
Visibility to Optical	0.00	0.00	0.00	Kill-Shots	0	0	0			
Visibility-OCS	0.0	0.0	0.0	Kill-Time	0	0	0	sec		
Indicator-1	Rank 1 Very large ground facility is detected	0.70	0.94	0.95	Indicator 1 Probability of Detection					
Indicator-2	Rank 2 Facility has extensive refueling infrastructure	0.60	0.98	0.90	Indicator 2 Probability of Detection					
Indicator-3	Rank 4 Launch gantries detected	0.50	0.63	0.90	Indicator 3 Probability of Detection					
Indicator-4	Rank 3 Missile launches detected	0.50	0.76	0.90	Indicator 4 Probability of Detection					
Indicator-5	Rank 5 Launched missiles have entered outer space	0.60	0.87	0.90	Indicator 5 Probability of Detection					
Indicator-6	Rank 6 SIGINT traffic indicates military space system	0.10	0.53	0.80	Indicator 6 Probability of Detection					
Indicator-7	Rank 0	0.00	0.00	0.00	Indicator 7 Probability of Detection					
Indicator-8	Rank 0	0.00	0.00	0.00	Indicator 8 Probability of Detection					
Indicator-9	Rank 0	0.00	0.00	0.00	Indicator 9 Probability of Detection					
Indicator-10	Rank 0	0.00	0.00	0.00	Indicator 10 Probability of Detection					

Locations of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (15)

The screenshot displays the 'Scenario Systems Templates' software interface. The main window shows a configuration for a 'UNLINK Mobile Missile Launcher' system. Key parameters include a system name 'CA Space Launch Ground Mobile-Launcher', location 'California', and a record number of 2390. The interface is divided into several sections:

- System Identification:** System Name, Short/Formal Name, Category, Record #, Record Date, and Scenario Name.
- Location & Base:** Country, State, Base Name, and System Color.
- Performance & Cost:** Tables for Min, Baseline, and Max values for System Quantity, Military Value, and Procurement Cost.
- Physical Characteristics:** System Age, LAT, LONG, Altitude, and Max Range.
- Operational Parameters:** Mass, SAT-Delta-V, Launcher-Type, and various time-based metrics.
- Vulnerability & Kill Data:** Tables for vulnerability to different threats and kill-type probabilities.
- Indicators:** A list of 10 indicators with associated detection probabilities.
- Weapon Effects:** A grid of checkboxes for various effects like Power, Structure, Propulsion, etc.

A 'View' window is open in the top right, showing a grid of 'Sheet' and 'Form' options for various system components like INTEL Msg, Sen Task, Real Sys, etc. The bottom status bar shows 'Record: 1 of 66 of 584' and 'Unfiltered Search'. The system description at the bottom right reads: 'Mobile ground system for missile launches carrying satellites into orbit. Operating area is in Northern region of AOR.'

Costs of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (16)

Scenario Systems Templates

System Public Name: UNK Aircraft

System Name: CA Space Launch Air-North | Category: Air | Record #: 2388

Short / Formal Name: CA_SLA_N | Debas: | RIN: | Type: Space Launch | Record Date: 4/19/2013 2:04:35 PM | Califon-North

Links N/A | CA_MAM_N | Sub-Type: Missile Launch Site | Scenario Name: Operation Blue Thund | LightCyan

Country: Califon | CA90F14 | BE Base | SPACE LAUNCH VEHIC | Icon: | System Color: 

	Min	Baseline	Max
System Quantity	3	3	5
Procurement Priority	3.0	4.4	8.0
Military Value	3.0	5.6	8.0
Procurement Cost	\$50 M	\$244 M	\$300 M

	Min	Baseline	Max
System Age	5	9	15
Mass	0	0	0
SAT-Delta-V	0	0	0
Altitude	12	11	3
Max Range	200	792	1,000

	Min	Baseline	Max
Vulnerability-Fit	0.60	0.70	0.80
Vulnerability-Laser	0.60	0.64	0.70
Vulnerability-Jammer	0.60	0.74	0.80

	Min	Baseline	Max
Surveillance-RCS	0.0	0.0	0.0
Surveillance-Mag	0.0	0.0	0.0
Visibility to RF	0.00	0.00	0.00
Visibility-RCS	0.0	0.0	0.0
Visibility to Optical	0.00	0.00	0.00
Visibility-OCS	0.0	0.0	0.0

Rank	Indicator	Min	Baseline	Max
1	Very large aircraft is detected	0.70	0.92	0.95
2	Aircraft has extensive refueling infrastructure	0.60	0.98	0.90
3	Aircraft has large missile	0.50	0.65	0.90
4	Aircraft orienting itself towards space	0.50	0.61	0.90
5	Missile launches detected	0.60	0.65	0.90
6	Launched missiles have entered outer space	0.60	0.66	0.90
7	SIGINT traffic indicates military space system	0.10	0.51	0.80
8		0.00	0.00	0.00
9		0.00	0.00	0.00
10		0.00	0.00	0.00

System Description: Mobile, air-launched system for missiles carrying satellites into orbit. Operating area is in Northern region of AOR.

Weapon Effects: Power, Structure, Propulsion, Antennas, Thermal, Optics, Altitude, Solar Panels, COMINT, TTSC, LEO, HED, MED, Trans Lunar, GEO, Earth

Record: 67 of 584 | Unfiltered | Search

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OBT-1 | JSTO-1 | COA-1

Range of Effects of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (17)

Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard Scenario Systems Form Templates

Scenario Systems Templates

System Public Name: UNLK Sub

System Name: CA Space Launch Sub-South Category: Sub Record #: 2395 Use: Add Add AOR

Short / Formal Name: CA_SLU_S Delize: RIN Type: Space Launch Record Date: 4/19/2013 2:04:35 PM Pacific-South

Links N/A CA_SLU_N Sub-Type: Missile Launch Site Scenario Name: Operation Blue Thund Plum

Country: Californ CA90F16 BE Base SUBMARINE-Friend.bn Icon Model System Color

Location: In Budget

	Min	Baseline	Max
System Quantity	3	5	5
System Age	5	6	15
Procurement Priority	3.0	3.9	8.0
Military Value	3.0	4.5	8.0
Procurement Cost	\$100 M	\$393 M	\$500 M

Overall value to the war effort of this system on a scale of 1 to 10, ten being the most valuable

	Min	Baseline	Max
Procurement Priority	3.0	3.9	8.0
Military Value	3.0	4.5	8.0
Procurement Cost	\$100 M	\$393 M	\$500 M

System Description: Sub-based system for missile launches carrying satellites into orbit. Operating area is in Southern region of AOR.

Indicator	Description	Min	Baseline	Max
Indicator-1	Sub missile launcher is detected	0.70	0.91	0.95
Indicator-2	Sub has extensive refueling infrastructure	0.20	0.74	0.60
Indicator-3	Sub has large missile	0.50	0.66	0.90
Indicator-4	Sub orienting itself towards space	0.50	0.83	0.90
Indicator-5	Missile launches detected	0.60	0.68	0.90
Indicator-6	Launched missiles have entered outer space	0.60	0.80	0.90
Indicator-7	Sub is operating in same location	0.60	0.72	0.90
Indicator-8	Sub is unusually stable	0.40	0.57	0.60
Indicator-9	SIGINT traffic indicates military space system	0.40	0.40	0.80
Indicator-10	Large sub is detected	0.60	0.85	0.90

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Record: 1 of 71 of 584 Unfiltered Search

What is the full System technical name

Num Lock

Military Value of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (18)

The screenshot displays a software interface for 'Scenario Systems Templates'. The main window shows system details for 'CA Space Plane Base-North'. A table at the bottom left lists 10 indicators with their respective ranks and descriptions. A 'Vulnerability system' tooltip is visible over the table. The interface includes a navigation pane on the left, a menu bar at the top, and a status bar at the bottom.

Rank	Description	Min	Baseline	Max	Indicator
1	Very large Aircraft is detected	0.70	0.95	0.95	Indicator 1 Probability of Detection
2	Aircraft has extensive refueling infrastructure	0.60	0.88	0.90	Indicator 2 Probability of Detection
4	Aircraft is operating in same location	0.50	0.67	0.90	Indicator 3 Probability of Detection
3	Aircraft orienting itself towards space	0.50	0.76	0.90	Indicator 4 Probability of Detection
5	Aircraft has entered outer space	0.60	0.77	0.90	Indicator 5 Probability of Detection
6	SIGINT traffic indicates military space system	0.10	0.80	0.80	Indicator 6 Probability of Detection
7		0.00	0.00	0.00	Indicator 7 Probability of Detection
8		0.00	0.00	0.00	Indicator 8 Probability of Detection
9		0.00	0.00	0.00	Indicator 9 Probability of Detection
10		0.00	0.00	0.00	Indicator 10 Probability of Detection

Vulnerabilities of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (19)

Scenario Systems Templates

System Public Name: UNK Aircraft

System Name: CA Space Plane-South

Short / Formal Name: CA_ASP_S

Country: Califon

System Quantity: 3

System Age: 5

Procurement Priority: 2.0

Procurement Cost: \$1,000 M

Bandwidth-Space-Gnd: C-Band

Bandwidth-Space-Space: Ku-Band

Bandwidth-TTC-Gnd: S-Band

Bandwidth-TTC-Space: X-Band

Survell Min Elev: 0

Base Surveillance-RCS: 0.0

Surveillance-Mag: 0.0

Visibility to RF: 0.70

Visibility-RCS: 20.0

Visibility to Optical: 0.60

Visibility-OCS: 3.0

Rank: 1

Indicator-1: Very large space object is detected

Indicator-2: Space object has large optical payload system on-board

Indicator-3: Space object is maneuvering a lot

Indicator-4: Space object is maneuvering near High Value Assets

Indicator-5: Space object is changing attitude a lot

Indicator-6: Space object orienting itself towards other satellites

Indicator-7: Space object in sun-synchronous orbit

Indicator-8: Space object not in public space catalog

Indicator-9: Aircraft has entered outer space

Indicator-10: SIGINT traffic indicates military space system

Min Baseline Max

4.6 5.0

7.4 8.0

2.500 3.901 4.500 kg

1.500 2.679 5.000 m/s

0.50 0.67 0.99

0.60 0.60 0.80

0.60 0.79 0.80

0.00 0.00 0.00

0.00 0.00 0.00

0 0 0

0 0 0

0 0 0

0 0 0

0.60 0.61 0.80

3.0 4.3 7.0

0.60 0.87 0.95

0.60 0.61 0.90

0.50 0.55 0.90

0.50 0.77 0.90

0.60 0.68 0.90

0.60 0.89 0.95

0.60 0.68 0.99

0.60 0.69 0.99

0.60 0.70 0.80

0.10 0.53 0.80

1 Is Best

10 Is Best

7,080 7,515 7,580 km

0.0000 0.0031 0.0070

98.2 99.1 99.2 deg

0 231 359 deg

0 14 359 deg

2008 2008

6 6 6

1 1 1

0 0 0

0 0 0

0.0000 0.0000 0.0000

Ground-launched space plane that can inspect and attack LEO satellites, place new satellites in orbit, repair satellites, and deliver space-to-Earth weapons. Based in Southern region of AOR.

Weapon Effects

Power Structure

Propulsion Antennas

Thermal Optics

Attitude Solar Panels

CDM/TIASC TTSC

LEO HED

MEO Trans Lunar

GEO Earth

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Record: 1 of 74 of 584

What is the full System technical name

Operational Timelines of Space Systems (Terrestrial & Orbital) Randomized

Notional Space Systems (20)

Scenario Systems Templates

System Public Name: UNK Large Satellite

System Name: CA Large LEO Space Surveillance-Radar

Short / Formal Name: CA_LRS_L

Location: In Budget

System Quantity	Min	Baseline	Max
1	6	10	

Procurement Priority	Min	Baseline	Max
5.0	8.5	9.0	

System Age	Min	Baseline	Max
5	9	15	

Mass	Min	Baseline	Max
500	2,449	3,200	

Vulnerability-FHT	Min	Baseline	Max
0.50	0.82	0.99	

Surveillance-RCS	Min	Baseline	Max
0.0	0.0	0.0	

Indicator-1	Rank	Min	Baseline	Max
Large space object is detected	6	0.60	0.81	0.95

System Description: Large-sized Radar satellite at LEO sun-synchronous orbit to detect satellites in orbit and moving targets on the ground.

Weapon Effects: Power, Propulsion, Thermal, Altitude, COMINT, LEO, MEO, GEO, Structure, Antennas, Optics, Solar Panels, TTSC, HED, Trans Lunar, Earth

Record: 1 of 83 of 584

Orbits of Space Objects Randomized

Notional Space Systems (21)

Scenario Systems Templates

System Public Name: UNK Mobile COMM

System Name: CA Small Ground Mobile TTC-South

Short / Formal Name: CA_SGT_S

Location: CA, CA90F23

System Quantity: Min 3, Baseline 3, Max 6

System Age: Min 5, Baseline 11, Max 15

System Description: Small-sized mobile ground Tracking, Telemetry and Control (TTC) system for monitoring satellites in Southern region of AOR.

Weapon Effects: Power, Structure, Propulsion, Antennas, Thermal, Optics, Altitude, Solar Panels, COMINT, TTNC, LEO, HED, MED, Trans Lunar, GEO, Earth

Rank	Indicator	Min	Baseline	Max	Description
1	Small ground vehicle is detected	0.70	0.90	0.95	Indicator 1 Probability of Detection
2	Ground vehicle has large RF antenna	0.60	0.97	0.90	Indicator 2 Probability of Detection
3	Ground vehicle is mobile	0.50	0.58	0.90	Indicator 3 Probability of Detection
4	Ground object orienting itself towards space	0.50	0.72	0.90	Indicator 4 Probability of Detection
5	Ground object has large power supply	0.60	0.90	0.90	Indicator 5 Probability of Detection
6	Ground object is emanating high RF power	0.60	0.82	0.95	Indicator 6 Probability of Detection
7	SIGINT traffic indicates military space system	0.10	0.49	0.80	Indicator 7 Probability of Detection
8		0.00	0.00	0.00	Indicator 8 Probability of Detection
9		0.00	0.00	0.00	Indicator 9 Probability of Detection
10		0.00	0.00	0.00	Indicator 10 Probability of Detection

Space Systems Also Includes Ground Systems Related to Space

Notional Space Systems (22)

Scenario Systems Templates

System Public Name: UNK Ship

System Name: CA Ship-Based Command-North

Short / Formal Name: CA_SBC_N

Category: Ship

Record #: 2380

Min Detect: 5.0%

On/Off: On

System Description: Ship-based mobile Command and Control Center for controlling space forces. Ship is located in Northern region of AOR.

System Quantity	Min	Baseline	Max	Procurement Priority	Min	Baseline	Max	1 Is Best
System Age	5	6	7	Military Value	3.0	3.6	7.0	10 Is Best
IOE	5	13	15	Procurement Cost	\$1,000 M	\$3,582 M	\$5,000 M	\$M

System Description	Min	Baseline	Max
SMA	0	0	0
Eccentricity	0.0000	0.0000	0.0000
Inclination	0.0	0.0	0.0
RAAN	0	0	0
ARG	0	0	0
Apogee	0	0	0
EPOCH-Year	0	2008	0
EPOCH-Month	0	6	0
EPOCH-Day	0	1	0
EPOCH-Hour	0	0	0
EPOCH-Minute	0	0	0
EPOCH-Seconds	0.0000	0.0000	0.0000

Indicator	Rank	Description	Min	Baseline	Max	Indicator	Description
Indicator-1	1	Large ship is detected	0.70	0.88	0.95	Indicator 1	Probability of Detection
Indicator-2	2	Ship has large RF system	0.60	0.95	0.90	Indicator 2	Probability of Detection
Indicator-3	6	Ship is operating in same location	0.50	0.77	0.90	Indicator 3	Probability of Detection
Indicator-4	3	Ship orienting itself towards space	0.50	0.68	0.90	Indicator 4	Probability of Detection
Indicator-5	4	Ship is unusually stable	0.60	0.70	0.90	Indicator 5	Probability of Detection
Indicator-6	5	Ship is emanating high RF power	0.60	0.83	0.95	Indicator 6	Probability of Detection
Indicator-7	7	SIGINT traffic indicates military space system	0.10	0.42	0.60	Indicator 7	Probability of Detection
Indicator-8	0		0.00	0.00	0.00	Indicator 8	Probability of Detection
Indicator-9	0		0.00	0.00	0.00	Indicator 9	Probability of Detection
Indicator-10	0		0.00	0.00	0.00	Indicator 10	Probability of Detection

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Record: 1 of 97 of 584

What is the full System technical name

Space Systems Also Includes Naval Systems Related to Space

Notional Space Systems (23)

Scenario Systems Templates

System Public Name: UNK Facility

System Name: CA Large Ground Laser ASAT-South

Short / Formal Name: CA_LGL_S

Location: CA90F27

System Quantity: 3 (Baseline: 5, Max: 6)

IOC: System Age 5 (Baseline: 9, Max: 15)

Orbit Parameters: LAT 34.0, LONG 242.9, Altitude 0

Vulnerability: Vulnerability-Laser 0.60 (Baseline: 0.67, Max: 0.70)

Indicators: Indicator-1: Very large ground object is detected (Rank 1, Prob 0.70)

Weapon Effects: Power, Structure, Antennas, Optics, Solar Panels, TTSC, HED, Trans Lunar, Earth

Future Notional Space Systems Can Also be Organized by Year Operational

Notional Space Systems (24)

Scenario Systems Templates

System Public Name: UNK Nano Satellite

System Name: NV Nano GEO Mine-Shrapnel | Category: Satellite | Record #: 2540

Short / Formal Name: NV_NMS_G_S | Type: Nano Satellite | Record Date: 4/22/2013 2:04:35 PM

Location: Nevidah | Country: NV90F09 | BE Base | Satellite ASAT-Mine-HK

	Min	Baseline	Max
System Quantity	10	41	50
System Age	1	2	3
Procurement Priority	5.0	7.6	8.0
Military Value	3.0	3.9	6.0
Procurement Cost	\$1M	\$4M	\$5M
Mass	1	9	10
SAT-Delta-V	50	114	300
Launcher-Type	N/A		
Launcher-Time	6	10	12
Satellite-Time	3.0	5	24
Vulnerability-Fit	0.80	0.98	0.99
Vulnerability-Laser	0.70	0.73	0.85
Vulnerability-Jammer	0.70	0.84	0.90
Survivability	0.0	0.0	0.0
Kill-Pk-Permanent	0.50	0.76	0.85
Kill-Pk-Temporary	0.10	0.17	0.20
Kill-Temporary-Time	24	55	72
Kill-Power	0	0	0
Kill-Shots	1	1	1
Kill-Time	1	1	1

System Description: Nano-sized space mine with optical and electronic sensors that maneuvers close to a target satellite, then detonates a pellet shrapnel cloud.

Weapon Effects: Power, Structure, Propulsion, Antennas, Thermal, Optics, Attitude, Solar Panels, COM, TTSC, LEO, HEO, MEO, Trans Lunar, GEO, Earth

Indicator 1: 5 Very Small space object is detected (0.10, 0.35, 0.40)

Indicator 2: 4 Space object has small optical payload system on-board (0.60, 0.32, 0.90)

Indicator 3: 3 Space object is maneuvering a lot (0.50, 0.53, 0.80)

Indicator 4: 1 Space object is conducting RPO's against high-value space assets (0.50, 0.67, 0.80)

Indicator 5: 2 Space object orienting itself towards high-value space assets (0.60, 0.66, 0.90)

Indicator 6: 6 Space object is changing attitude (0.60, 0.89, 0.90)

Indicator 7: 7 Space object has not been previously cataloged (0.10, 0.39, 0.40)

Indicator 8: 8 SIGINT traffic indicates military space system (0.10, 0.59, 0.80)

Indicator 9: 0 (0.00, 0.00, 0.00)

Indicator 10: 0 (0.00, 0.00, 0.00)

System Parameters: SMA 42,160 | Baseline 42,162 | Max 42,170 km

System Description: 0.0 For space systems, what is the Semi-Major Axis of its orbit (in kilometers). Geostationary SMA = 42164.69669 km; Sun-Synchronous SMA = 7278.137 km (Earth's diameter = 6378.137 km)

System Description: EPOCH-Year 2008, EPOCH-Month 6, EPOCH-Day 1, EPOCH-Hour 0, EPOCH-Minute 0, EPOCH-Seconds 0.0000

System Description: Anomaly 87

System Description: All Rec 2008

System Description: Comments

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Record: 158 of 584 | Unfiltered | Search

OBT-1 | JSTO-1 | COA-1

Some Notional Future Space-Based Weapon Systems Are Included

Notional Space Systems Spreadsheet

Type	Sub-Type	System Name-Formal	System Name	Kill-Type	AOR	Index	Vulnerability-Hit	Vulnerability-Hit-Min	Checkout-Time-Max	Indicator-6-Prc	Indicator-6-Prob-M	Indicator-5-Prob-Ms	Indicator-5-
Large Satellite	Communications	Saniyat Mirqaf	NV Large GEO COMM Satellite	N/A	GEO	2612	0.92	0.50	336	0.71	0.60	0.90	0.83
Large Satellite	Missile Warning	Saniet es- Siyah	NV Large GEO MSL Warning Satellite	N/A	GEO	2613	0.70	0.50	336	0.80	0.80	0.90	0.64
Large Satellite	Navigation	al Khashab	NV Large GEO NAV Satellite	N/A	GEO	2614	0.91	0.50	336	0.52	0.10	0.90	0.74
Medium Satellite	Navigation	Khalfiyah	NV Medium MEO NAV Satellite	N/A	MEO	2615	0.55	0.50	336	0.67	0.60	0.80	0.76
Large Satellite	Photo	Tarsin	NV Large LEO Photo Satellite	N/A	LEO	2621	0.52	0.50	336	0.72	0.60	0.90	0.89
Large Satellite	SIGINT	as Suwayniah	NV Large GEO SIGINT Satellite	N/A	GEO	2622	0.92	0.50	336	0.84	0.80	0.90	0.81
Large Satellite	Weather	az Zahirah	NV Large LEO WX Satellite	N/A	LEO	2623	0.59	0.50	336	0.90	0.60	0.90	0.88
Large Satellite	Weather	Aqilah	NV Large GEO WX Satellite	N/A	GEO	2624	0.85	0.50	336	0.11	0.10	0.90	0.89
Large Satellite	Inspector	el Ghizlan	NV Large LEO Inspector Satellite	Ram	LEO	2625	0.84	0.50	72	0.66	0.60	0.90	0.74
Large Satellite	Inspector	el Ghizlan	NV Large GEO Inspector Satellite	Ram	GEO	2626	0.52	0.50	72	0.70	0.60	0.90	0.63
Space Launch	Missile Launch Site	Ez Zgarir	NV Space Launch Site-South-Fixed	N/A	Korona-KSC-LP	2645	0.78	0.60	0	0.11	0.10	0.90	0.89
Sensor	RF	al Hamar	NV Large Ground Sensor-RF-North	N/A	Korona-North	2661	0.69	0.50	0	0.85	0.60	0.90	0.83
Large Satellite	Radar	Qiddid	NV Large LEO Space Surveillance-Radar Satellite	N/A	LEO	2665	0.90	0.50	336	0.83	0.60	0.90	0.85
Large Satellite	Optical-SSN	Hawwash	NV Large LEO Space Surveillance-Optical Satellite	N/A	LEO	2666	0.52	0.50	336	0.82	0.60	0.90	0.61
Fixed	Command	al Marafiq	NV Large Ground Fixed Command-North	N/A	Korona-North	2667	0.71	0.50	0	0.76	0.60	0.90	0.62
Fixed	TTC	Karmah	NV Large Ground Fixed TTC-South-Fixed	N/A	Korona-KSC-TTC	2668	0.61	0.50	0	0.92	0.60	0.90	0.70
Mobile	TTC	Hawwash	NV Small Ground Mobile TTC-South	N/A	Korona-South-FL	2672	0.56	0.50	0	0.83	0.60	0.90	0.63
ASAT	Laser	Tmed Atua	NV Large Ground Laser ASAT-South	Laser	Korona-South	2683	0.73	0.50	0	0.82	0.60	0.90	0.85
ASAT	RF	Dacar	NV Mobile Ground Jammer-RF-North	Jammer	Korona-North	2688	0.53	0.50	0	0.70	0.60	0.90	0.76
ASAT	Laser	al Khashab	NV Mobile Laser Blinder-North	Blinder	Korona-North	2695	0.77	0.50	0	0.61	0.60	0.90	0.87
ASAT	Missile-Mobile	Tubul	NV Space Launch ASAT Ground Mobile-South	N/A	Korona-South-FL	2746	0.64	0.60	0	0.78	0.60	0.90	0.81
ASAT	Missile-Mobile	Tubul	NV Space Launch ASAT Ground Mobile-North	N/A	Korona-North	2745	0.62	0.60	0	0.70	0.60	0.90	0.75
ASAT	RF	Dacar	NV Mobile Ground Jammer-RF-South	Jammer	Korona-North-FL	2686	0.67	0.50	0	0.70	0.60	0.90	0.77
Facility	Research	ad Darbadah	NV Space Research Facility-North	N/A	Korona-North	2702	0.75	0.60	0	0.00	0.00	0.80	0.70
Large Satellite	Maintenance	Papaokena	NV Large GEO Maintenance Satellite	Ram	GEO	2741	0.96	0.50	72	0.72	0.60	0.90	0.68
Large Satellite	Maintenance	Papaokena	NV Large LEO Maintenance Satellite	Ram	LEO	2742	0.62	0.50	72	0.63	0.60	0.90	0.86
Facility	Research	Bin Qinnad	NV Industrial Research Facility-South	N/A	Korona-South-FL	2735	0.62	0.60	0	0.00	0.00	0.80	0.23
Facility	Research	Shaftah	NV Industrial Research Facility-North	N/A	Korona-North	2736	0.68	0.60	0	0.00	0.00	0.80	0.63
SAM	Missile Launch Site	Edeba	NV SAM Launch Site-North	N/A	Korona-North	2752	0.71	0.60	0	0.17	0.10	0.90	0.61
Large Satellite	Communications	Veronne	CA Large GEO COMM Satellite	N/A	GEO	2324	0.54	0.50	336	0.87	0.60	0.90	0.73
Large Satellite	Missile Warning	Colline	CA Large GEO MSL Warning Satellite	N/A	GEO	2319	0.62	0.50	336	0.85	0.80	0.90	0.70
Large Satellite	Navigation	Lemou	CA Large GEO NAV Satellite	N/A	GEO	2326	0.88	0.50	336	0.38	0.10	0.90	0.89
Medium Satellite	Navigation	La Preville	CA Medium MEO NAV Satellite	N/A	MEO	2329	0.74	0.50	336	0.72	0.60	0.80	0.61
Medium Satellite	Navigation	La Preville	CA Medium MEO NAV Satellite	N/A	MEO	2328	0.98	0.50	336	0.64	0.60	0.80	0.68
Medium Satellite	Navigation	La Preville	CA Medium MEO NAV Satellite	N/A	MEO	2332	0.80	0.50	336	0.84	0.60	0.80	0.72
Medium Satellite	Navigation	La Preville	CA Medium MEO NAV Satellite	N/A	MEO	2331	0.62	0.50	336	0.79	0.60	0.80	0.73
Medium Satellite	Navigation	La Preville	CA Medium MEO NAV Satellite	N/A	MEO	2330	0.82	0.50	336	0.69	0.60	0.80	0.60
Medium Satellite	Navigation	La Preville	CA Medium MEO NAV Satellite	N/A	MEO	2327	0.68	0.50	336	0.81	0.60	0.80	0.77
Large Satellite	Photo	Darapin	CA Large LEO Photo Satellite	N/A	LEO	2335	0.91	0.50	336	0.85	0.60	0.90	0.70
Large Satellite	SIGINT	Carpal	CA Large GEO SIGINT Satellite	N/A	GEO	2334	0.56	0.50	336	0.84	0.80	0.90	0.69
Large Satellite	Weather	Tortue	CA Large LEO WX Satellite	N/A	LEO	2333	0.81	0.50	336	0.78	0.60	0.90	0.90
Large Satellite	Weather	Johanisse	CA Large GEO WX Satellite	N/A	GEO	2325	0.79	0.50	336	0.50	0.10	0.90	0.69
Large Satellite	Inspector	Blain	CA Large LEO Inspector Satellite	Ram	LEO	2421	0.57	0.50	72	0.78	0.60	0.90	0.71
Large Satellite	Inspector	Blain	CA Large MEO Inspector Satellite	Ram	MEO	2422	0.84	0.50	72	0.74	0.60	0.90	0.79
Large Satellite	Inspector	Blain	CA Large GEO Inspector Satellite	Ram	GEO	2323	0.64	0.50	72	0.85	0.60	0.90	0.66
Micro Satellite	Inspector	Savanne	CA Micro LEO Inspector Satellite	Ram	LEO	2420	0.85	0.80	48	0.86	0.60	0.90	0.73
Micro Satellite	Inspector	Savanne	CA Micro MEO Inspector Satellite	Ram	MEO	2423	0.91	0.80	48	0.70	0.60	0.90	0.76
Micro Satellite	Inspector	Savanne	CA Micro GEO Inspector Satellite	Ram	GEO	2322	0.91	0.80	48	0.63	0.60	0.90	0.89
Nano Satellite	Inspector	Medaqui	CA Nano MEO Inspector Satellite	Ram	MEO	2424	0.87	0.80	24	0.88	0.60	0.90	0.83
Nano Satellite	Inspector	Medaqui	CA Nano GEO Inspector Satellite	Ram	GEO	2321	0.93	0.80	24	0.89	0.60	0.90	0.67
Nano Satellite	Inspector	Medaqui	CA Nano LEO Inspector Satellite	Ram	LEO	2419	0.80	0.80	24	0.77	0.60	0.90	0.75
Large Satellite	Space Mine	Gelin	CA Large LEO Mine Carrier	Ram	LEO	2345	0.89	0.50	336	0.39	0.10	0.90	0.65
Large Satellite	Space Mine	Colline	CA Large GEO Mine Carrier	Ram	GEO	2344	0.84	0.50	336	0.56	0.10	0.90	0.64

Space Systems Can be Viewed as a Spreadsheet With Characteristics Colored by Value Range

Selected Notional Space Systems (1)

Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard Space Games Data Development Scenario Systems Form

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Scenario Systems

Report SATCAT Copy New Delete Find Close On Off Exit

Full Name: Veronne Large GEO COMM Satellite Linked SSN: Linked Name: Photo

System Name: CA Large GEO COMM Satellite Category: Satellite Record #: 5 Use: Use-Back: ACR

Short / Formal Name: CA_LCS Veronne Type: Large Satellite Record Date: 6/16/2008 2:04:35 PM GEO

Non-Target Links N/L: Sub-Type: Communications Scenario Name: Operation Blue Thund Region

Grd Name: Country: Califon Califon BE #: CA90F01005 BE # Final: CA90F01005 SDR GEO

Location: Public Name: UNK Large Satellite (5) Short Name: CA_LCS_005 Icon: Satellite COMM-Frien System Color: Cyan

In Budget Final Name: Veronne Large GEO COMM Satellite SC Reason: State Change: 0 0 Orbital Change

System Quantity: 10 Mission/Final: Priority: 3.1 1 Is Best

Now System Age: 14 Large Satellite Value: 9.8 10 Is Best

10 Yr Random Cost: \$118 M \$M SMA: 42,164 km

20 Yr LAT: 0.0 deg Mass: 5,970 kg Eccentricity: 0.0004

30 Yr LONG: 0.0 deg SAT-Delta-V: 819 m/s Indination: 4.2 deg

Highlight Altitude: 0 km Launcher-Type: N/A RAAN: 236 deg

Max Range: 0 km Launcher-Time: 23 hrs ARG: 47 deg

Bandwidth-Space-Gnd: C-Band Satellite-Time: 215 hrs Anomaly: 197 deg

Bandwidth-Space-Space: N/A Vulnerability-Hit: 0.54

Bandwidth-TTC-Gnd: S-Band Vulnerability-Laser: 0.73

Bandwidth-TTC-Space: N/A Vulnerability-Jammer: 0.64

Surveill Min Elev: 0 Kill-Type: N/A

Surveillance-RCS: 0.0 Kill-Pk-Permanent: 0.00

Surveillance-Mag: 0.0 Kill-Pk-Temporary: 0.00

Visibility to RF: 0.75 Kill-Temporary-Time: 0 hrs

Visibility-RCS: 8.6 dBsm Kill-Power: 0 watt

Visibility to Optical: 0.76 Kill-Shots: 0

Visibility-OCS: 6.7 mag Kill-Time: 0 sec

System Description: Large-sized satellite communications satellite at geostationary orbit.

Comments:

Indicator-1: 7 large space object is detected 0.88 Indicator 1 Probability of Detection

Indicator-2: 1 Space object has very large antennas on-board 0.80 Indicator 2 Probability of Detection

Indicator-3: 4 Space object is maneuvering very little (stationkeeping only) 0.75 Indicator 3 Probability of Detection

Indicator-4: 2 Space object orienting itself towards the Earth 0.70 Indicator 4 Probability of Detection

Indicator-5: 3 Space object is not changing attitude 0.73 Indicator 5 Probability of Detection

Indicator-6: 5 Space object has large solar arrays 0.87 Indicator 6 Probability of Detection

Indicator-7: 6 Space object has large heat radiators 0.60 Indicator 7 Probability of Detection

Indicator-8: 8 SIGINT traffic indicates military space system 0.46 Indicator 8 Probability of Detection

Indicator-9: 0 Indicator 9 Probability of Detection

Indicator-10: 0 Indicator 10 Probability of Detection

Weapon Effects:

- Power
- Structure
- Propulsion
- Antennas
- Thermal
- Optics
- Altitude
- Solar Panels
- COMM
- TT&C
- LEO
- HEO
- MEO
- Trans Lunar
- GEO
- Earth

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Record: 1 of 652 Unfiltered Search

OBT-1 JSTO-1 COA-1

What is the full System technical name

Num Lock

These are the Actual Space Systems & Characteristics Selected After Randomization

Selected Notional Space Systems (2)

Scenario Systems

Full Name: Pangnol Large GEO Maintenance Satellite | System Name: CA Large GEO Maintenance Satellite | Category: Satellite | Record #: 522 | Use: | Use-Back: | ACR:

Short / Formal Name: CA_LMS_G | Pangnol | Type: Large Satellite | Record Date: 6/16/2008 2:04:35 PM | GEO | Region:

Non-Target: | Links N/A: CA_LMS_L | Sub-Type: Maintenance | Scenario Name: Operation Blue Thund | System Color: Purple

Grd Name: Country: Califon | UNLK | BE #: CA90F08007 | BE # Final: UNLK | System Color: Purple

Location: Public Name: UNLK Large Satellite | Short Name: | Icon: Satellite Supply-Frien | Orbital Change:

In Budget: | Final Name: UNLK Large Satellite | SC Reason: | State Change: 0 | 0

System Quantity: 4 | Mission/Final: | Priority: 7.2 | 1 Is Best:

Now: | System Age: 4 | UNLK | Value: 4.6 | 10 Is Best:

10 Yr: | Random | Cost: \$194 M | \$M | SMA: 42,165 km

20 Yr: | LAT: 0.0 deg | Mass: 362 kg | Eccentricity: 0.0052

30 Yr: | LONG: 0.0 deg | SAT-Delta-V: 6,125 m/s | Incination: 4.4 deg

Highlight: | Altitude: 0 km | Launcher-Type: N/A | RAA: 258 deg

Max Range: 0 km | Launcher-Time: 6 hrs | ARG: 245 deg

Bandwidth-Space-Gnd: Ku-Band | Satellite-Time: 71 hrs | Anomaly: 268 deg

Bandwidth-Space-Space: Ku-Band | Vulnerability-Hit: 0.77

Bandwidth-TTC-Gnd: X-Band | Vulnerability-Laser: 0.67

Bandwidth-TTC-Space: X-Band | Vulnerability-Jammer: 0.66

Surveill Min Elev: 0 | Kill-Type: Ram

Surveillance-RCS: 0.0 | Kill-Pk-Permanent: 0.00

Surveillance-Mag: 0.0 | Kill-Pk-Temporary: 0.00

Visibility to RF: 0.55 | Kill-Temporary-Time: 0 hrs

Visibility-RCS: 41.2 dBsm | Kill-Power: 0 watt

Visibility to Optical: 0.55 | Kill-Shots: 0

Visibility-OCS: 8.2 mag | Kill-Time: 0 sec

Indicator-1: 5 | Large space object is detected | 0.66 | Indicator 1 Probability of Detection

Indicator-2: 4 | Space object has excess fuel on-board | 0.78 | Indicator 2 Probability of Detection

Indicator-3: 3 | Space object is maneuvering a lot | 0.66 | Indicator 3 Probability of Detection

Indicator-4: 1 | Space object is conducting RPO's against high-value space assets | 0.62 | Indicator 4 Probability of Detection

Indicator-5: 2 | Space object orienting itself towards high-value space assets | 0.85 | Indicator 5 Probability of Detection

Indicator-6: 6 | Space object is changing attitude | 0.85 | Indicator 6 Probability of Detection

Indicator-7: 7 | SIGINT traffic indicates military space system | 0.57 | Indicator 7 Probability of Detection

Indicator-8: 0 | | 0.00 | Indicator 8 Probability of Detection

Indicator-9: 0 | | 0.00 | Indicator 9 Probability of Detection

Indicator-10: 0 | | 0.00 | Indicator 10 Probability of Detection

System Description: Large-sized maintenance satellite with spare parts and refueling capabilities that rendezvous with a target satellite in GEO to repair and refuel it.

Weapon Effects: Power, Structure, Propulsion, Antennas, Thermal, Optics, Altitude, Solar Panels, COM, FTTC, LEO, HEO, MEO, Trans Lunar, GEO, Earth

Records: 1 of 28 of 652 | Unfiltered | Search | UNCLASSIFIED | OBT-1 | JSTO-1 | COA-1

Other Space Systems Selected

Wargame Real Space Systems

Current Space Systems Employed in Wargame

Real Space Systems

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Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools PS-Form-SIPB-5-6 Space Games Switchboard Space Games Data Development Sheet Form Satellite Catalog

Satellite Catalog Select Satellites Select Range Export Use All Off All Live On View Use Blue SOB Debris Off Graphs Statistics Print Find Close

Save/Retrieve Use SAW Setup View Excel Edit On All Dead Off Calc SSA Gray SOB

Record Date 13-Jul-04 Priority P Type SDR LED-S SD Region Use Target Chaser # of Unique Selected Objects 0

Category Live Study Name Satellite Imagery-Friend.bmp ICION Photo Flashing Plan New Update Icon

Satellite Description SAITCAT # 26032 Size Category International # 1999-070A Shape Object Name KOMPSAT Size Second Name Anirang-1 Dim: X / Y / Z 1.4 4.6 2.5 Third Name Anirang-1 Mass 420 Country South Kor Power Mission OPTICAL - LED-S - Active Delta-V Launch Site AFWTR Propulsion Launch MSL Taurus Stabilization Launch Date 21-Dec-99 Bus Name Orbital Status RCS <2000 Decay Date RCS>2000-Now 2.59 Satellite Status Active RCS-12 Months 2.12 Status Date Last RCS 2.13 Manufacturer RCS Sensor UHF

Optical Properties Approved Retro Spin Rate Flash Period Sensor Flash Period Sensor Visual Magnitude 7 Magnitude Sensor Magnitude-PPAS S 7 Magnitude-Flag d Observation Date

Other Max Freq (MHz) SAIC Model EXER-BE Number EXER System Name

Two Line Element Set

Line 1	Definition	Line 2		
EPOCH	13072.52635454	EPOCH Date	13-Mar-13	
1st Mean Motion	5.93E-06	Inclination	97.76	
2nd Mean Motion	0.00E+00	RAN	271.3	
BStar	1.15E-04	Eccentricity	4.3E-04	
Ephemeris Type	0	Arg Perigee	201.9	
Element #	844	Mean Anomaly	158.2	
Altitude	680	KM Mean Motion	14.6668	
Period In Minutes	98	Minutes	Rev #	70752
Period In Hours	1.64	Hours	Update TLE's	

Geostationary Data GEO Position Drift Rate

Lifetime Data Design Lifetime 3.0 Assumed Delta-V % Life Left Delta-V Left

Space-to-Space Sensors Real Space-Space Sensor Exercise Data Notional Data

Space-to-Terrestrial Sensors

SOAP Name: Med KOMPSAT (7m)	Range-Min: 0
SOAP Sensor Name: Sensor-Med-KOMPSAT-FOV	Range-Max: 10,000
Quality-Sensor: 100.00%	Field of Regard:
Sensor Face: +Z	Field of View:
Resolution: 1 km	Clock-1: 45.00
Accuracy:	Cone-Min-1: 0.71
NIIRS Rating: Pan-2	Cone-Max-1: 90.00
Confidence-Sensor: Medium	Clock-2: 135.00
Detection Delay: 0.5	Cone-Min-2: 0.71
Sensor Operating Mode: Kompsat Sensor 2	Cone-Max-2: 90.00
Sensor Name: Kompsat Sensor 2	Clock-3: 225.00
Type of Instrument: imager E.O.	Cone-Min-3: 0.71
Mission of Sensor: imager for ocean resource mc	Cone-Max-3: 90.00
Scan Method:	Clock-4: 315.00
Data Rate:	Cone-Min-4: 0.71

Satellite Photo 1 Satellite Photo 2

SID Comments The science objectives of KOMPSAT-1 are:
 - To provide high-resolution imagery of the Korean Peninsula using EOC (Electro Optical Camera)
 - To collect wide-swath multispectral imagery of the ocean and coastal zones to support biological oceanography
 - To provide information on the LEO particle environment and globally on the plasma distribution in the ion layer using SPS (Space Physics Sensor)

SWAT Comments The Kompsat 1 (Korean Multi-purpose Satellite 1) was developed jointly by KARI and TRW. The payload is consisted of three instruments:
 Electro-Optical Camera (EOC), Ocean Scanning Multispectral Imager (OSMI), Space Physics Sensor (SPS) KOMPSAT Korea Multi-Purpose Satellite
 KOMPSAT is the first joint

User Can Select from Thousands of Real Satellites with Actual Orbital Elements

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Record: 11 of 22 of 57 Filtered Search

NORAD assigns a catalog number based upon when the object was first observed, whereas the International Designator is...

Num Lock Filtered

These Are Actual Space Objects in the Joint Space Operations Center (JSpOC) Databases

Real Space Systems Statistics Menu

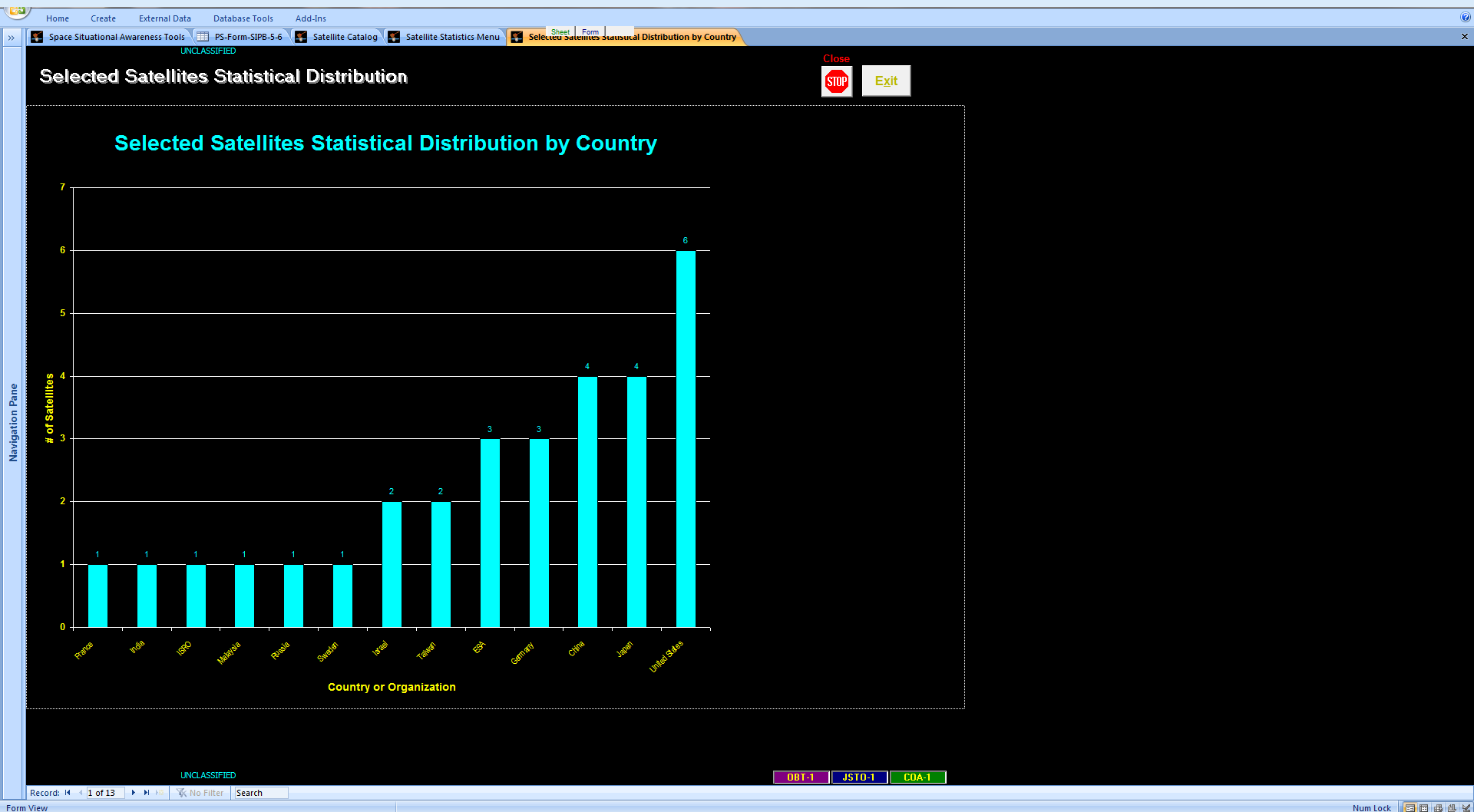
The screenshot shows a software application window titled "Satellite Statistics Menu" overlaid on a satellite image of Earth. The window has a menu bar with "Home", "Create", "External Data", "Database Tools", and "Add-Ins". Below the menu bar, there are tabs for "Space Situational Awareness Tools", "PS-Form-SIPB-5-6", "Satellite Catalog", and "Satellite Statistics Menu". The main content area of the window contains a "Satellite Statistics" title bar with a "Close" button and a "STOP" icon. Below this, there are several buttons arranged in a grid:

- Size Category Graph
- Satellite Mission Graph
- Satellite Status Graph
- Launch Date Graph
- Launch Site Graph
- Country Graph
- Altitude Graph
- Inclination Graph
- Eccentricity Graph
- Altitude Ranges
- Inclination Ranges
- Altitude vs Inclination
- Vis Magnitude Graph
- Radar Cross Section
- View Data In Powerpoint
- Exit

At the bottom of the window, there are three buttons labeled "OBT-1", "JSTO-1", and "COA-1". The background image shows two satellites in orbit over a desert landscape. The window title bar at the bottom left says "Exit this current form" and the bottom right shows "Num Lock" and system icons.

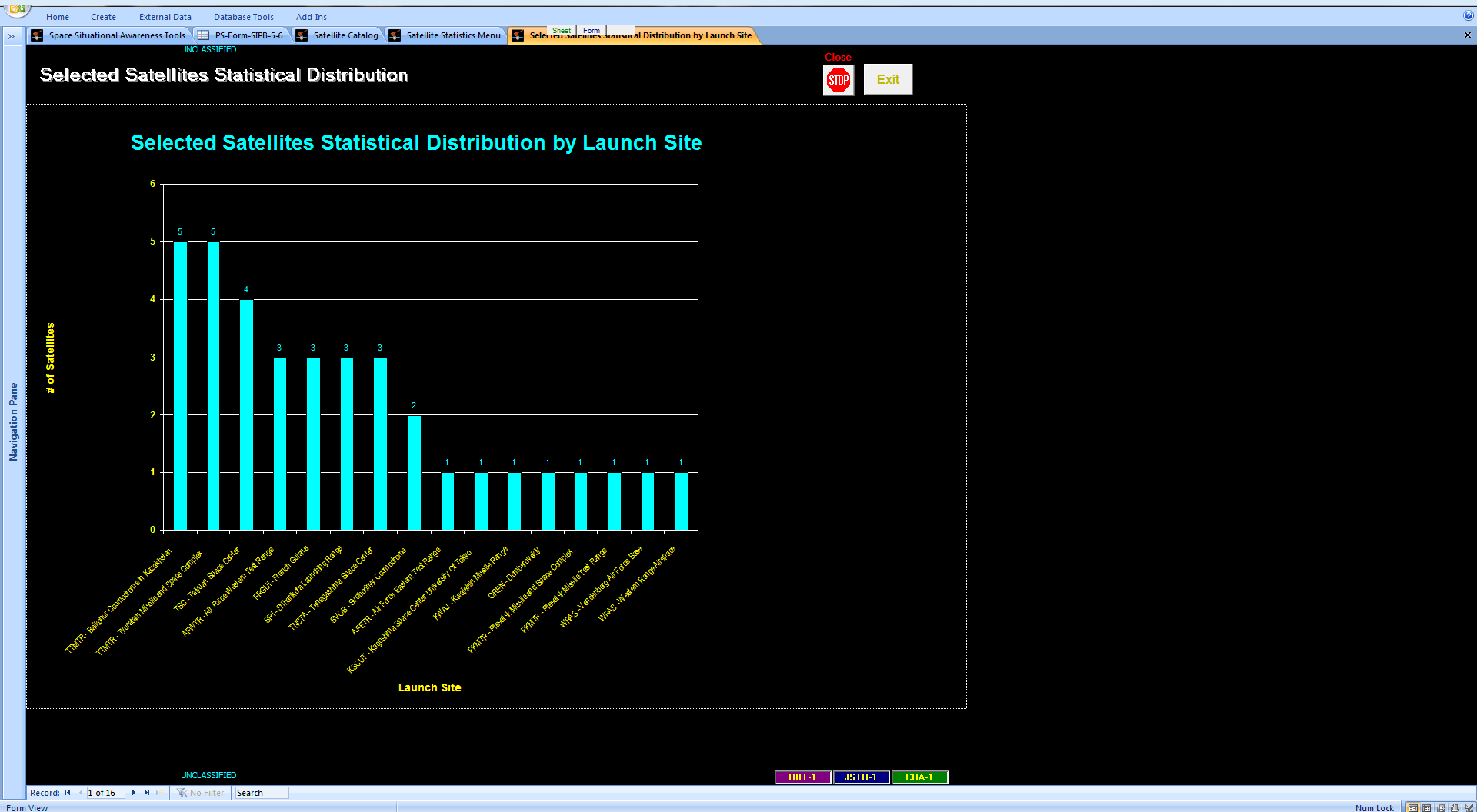
Real Space Objects can be Statistically Analyzed

Real Space Systems Statistics Graph (1)



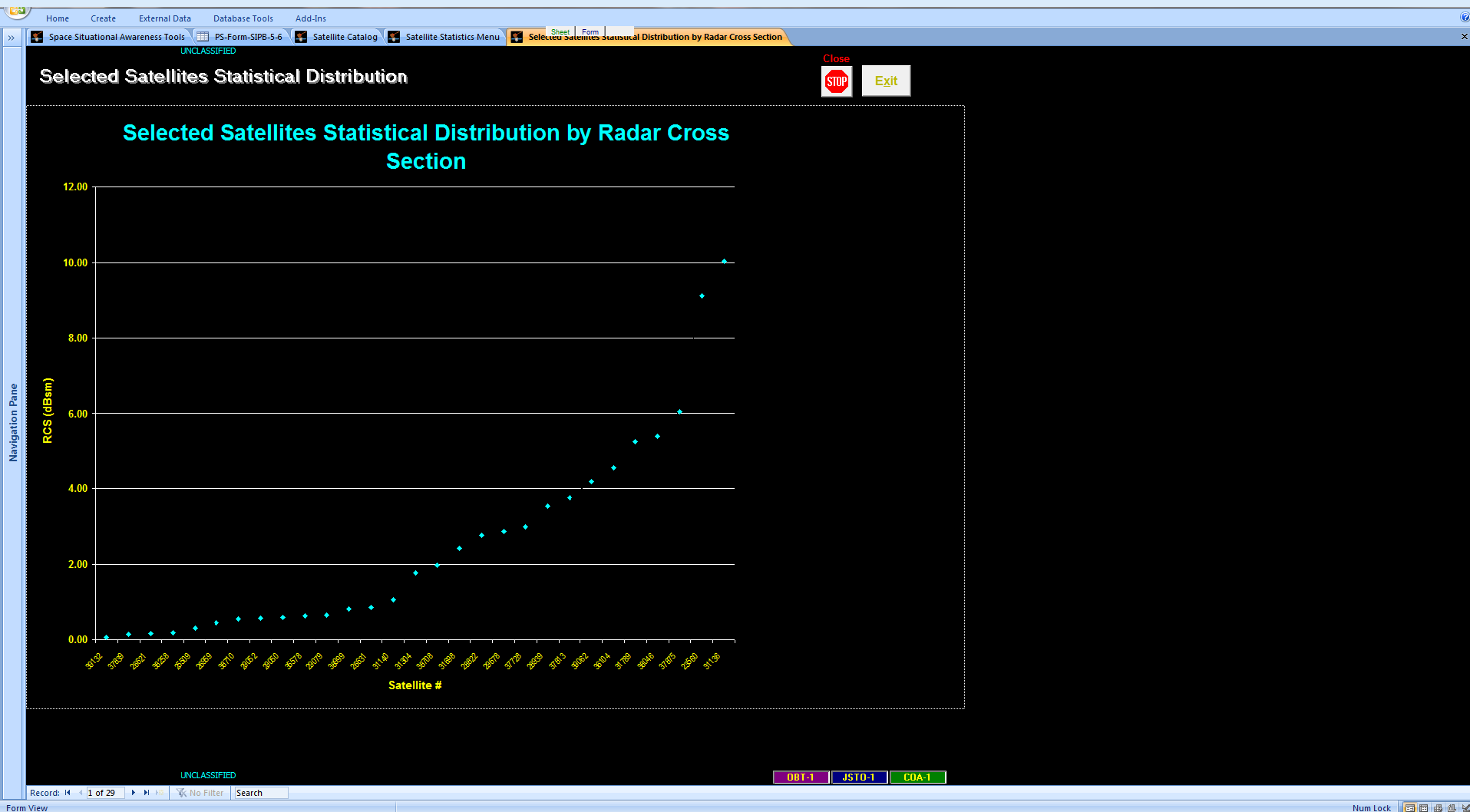
Which Country Launched the Most Satellite of the Selected Category

Real Space Systems Statistics Graph (2)



Which Site Launched the Most Satellite of the Selected Category

Real Space Systems Statistics Graph (3)



Which Satellites of the Selected Category Have the Largest RADAR Cross Section (RCS)

Real Military Terrestrial Systems

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Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools PS-Form-SIPB-5-6 Space Games Switchboard Space Games Data Development Sheet Form Link Definitions All Nodes Data Entry Switchboard Space-Rel

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Space-Ground Nodes/Links Required Data

Copy New Find Delete Close More Data Go Back

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Space-Ground Node Details

Node/Link Name: **Yathagarra Mobile Laser Ranging Fa** Probability of Success: **95.00%** Calc Engine Organization: Australia Space Office / British Aerosp

BE Number: Transfer Record Reliability: **95.00%** Address: Latitude: Deg DMPI Number:

Type: **Process** Satellite Ground Time Delay: **2** Hr Builder: Longitude: Deg O-Suffix Number:

Category: **Mobile Satellite Terminal** SIAM Categories Vulnerability: 100.00% Data Distributed By: Altitude: **0** Km Unit Capacity: **0** Mbps Facility Category:

Owner: **Australia** Highlight Accessability: 100.00% Inserted Data: Total Capacity: Mission Category:

Country Location: **Australia** Bomb Damage Assessment: 100.00% Raw Data Format: Number of Channels: Bandwidth: Mhz

Sub-Division: Probability of Use: 100.00% Product Format: Capacity Confidence: COMM Antenna: Signal Type: Frequency: OCC: ICC: Network Name: Network User: Network Comments:

Operational Date: **01-Jan-1950** Node Quality: 100.00% Source Title: Source Author: Source Date: Source Page: 2 Other Source: n/a. Cost Value: Cost Description:

Expected Lifetime: 100 Years Criticality: 0 Source Data: Source Page: 2 Other Source: n/a. Cost Value: Cost Description:

Operational Status: active Impact of Loss: Comments:

Exclude Reason: Data Source: **Jane's Space Directory 1996-97** Data Confidence: **Medium**

Data Update Date: 01-Nov-1997 Now Use: Record Number: 1397 View Last Record

Record User: User Location: Job Designator: User Logon Date: 8/15/2000 3:11:47 PM

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OBT-1 JSTO-1 COA-1

UNCLASSIFIED

OBT-1 JSTO-1 COA-1

Records: 1 of 1552 Unfiltered Search

Enter the name of the node

Num Lock

Navigation Pane

Yathagarra Mobile Laser Ranging Fa

DCCA DCA OCS DCS OCI DCI Launch Health and Status Recorded Data Data Archiving

Intel Msg: Sheet Form Sen Task: Sheet Form Intel Sum: Sheet Form Real Sys: Sheet Form Red COA: Sheet Form Exer Sys: Sheet Form Blue COA: Sheet Form Weapons: Sheet Form

Find Delete Close

SSA-T Also includes Some Data on Non-Space Terrestrial Systems that can be Used in the Wargame

Space Wargame Execution Tools

Helps Run the Space Wargame

Space Wargame Execution Main Menu

War Room

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Close Exit

Current Date / Time: Saturday, December 07, 2013 3:58:44 PM

Time of Next Event: 4/21/2011 9:35:18 AM AM

Time to Go: Past Due Send

1 Review Exercise Systems

2 Review Real Satellites

3 Maps
AORs
Map Icons

4 SAW Situation Map

5 Space IPB

6 INTEL Reports
View Send

7 INTEL Summaries
View Send

8 Sensor Tasking
View Send

9 Mission Assessments

10 State Change Assessments

11 Current Space INTEL Situation

12 Red COA Current Situation

13 Blue COA

14 Blue Weaponeering

15 Blue Attack Sequences

A Import Data

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

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OBT-1 JSTO-1 COA-1

View this data in spreadsheet format

Num Lock

Main Wargame Execution Menu

INTEL Situation Reports

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Space Games Switchboard Space Sheet Form

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Courses Of Action Events

Setup Messages Export All Messages Random Truth

Copy New Delete Find Close

View

INTEL Msg: Sheet Form Sen Task: Sheet Form
 INTEL Sum: Sheet Form Real Sys: Sheet Form
 Red COA: Sheet Form Exer Sys: Sheet Form
 Blue COA: Sheet Form Weapons: Sheet Form

Index-Access: 25065 Unique-ID: 6717 Record Date: 12/7/2013 7:55:31 AM
 Index-Project: 5500 GUID: 6DE99E5F-20B3-40 Data_Change_Date: 3/25/2009 8:00:00 AM
 Side: Red WBS: IT.6.9.3.2.6.1.9

Use Always Use Message Completed Systems-Red Scenario Name: Operation Blue Thunder
 Use Random Use-Send Hide Systems-Blue COA-Category: Tactic
 Use Never On Off Blank Systems-Gray Conflict Level: Phase Va: Joint Counter-Offensive to Restore
 Launch-Maneuver Random Note COA-Type: Activity Type: Attack

Attacker System

BE Number	LAT	Indicator-1	Rank	Prob
NX90F28028	28.46	Medium-sized missile is detected	1	0.89
NX90F28	278.49	Mobile launcher has extensive refueling infrastr	2	0.78
UNK	0.00	Mobile launcher has medium missile	4	0.54
Newmex		Mobile launcher orienting itself towards space	3	0.58
UNK		Missile launches detected	5	0.81
Newmex-South		Launched missiles have entered outer space	6	0.78
Ground		SIGINT traffic indicates military space system	7	0.72
ASAT		NA	0	0.00
Missile-Mobile		NA	0	0.00
UNK		NA	0	0.00

Use Always-2 Indicator Prob Average: 0.50

Targeted System

BE Number	LAT
CA90F05005	
CA90F05	
UNK	0.00
Calfon	SAT-SMA: 7,080
UNK	SAT-Eccentricity: 0.00
UNK	SAT-Inclination: 98.66
SDR LEO-S	SAT-RAAN: 33.08
Satellite	SAT-ARG: 0.13
Large Satellite	SAT-Anomaly: 17.43
Photo	SAT-EPOCH-Year: 2008
UNK	SAT-EPOCH-Month: 6
Darapi Large LEO Photo Satellite	SAT-EPOCH-Day: 1
UNK Large Satellite (444)	SAT-EPOCH-Hour: 0
UNK Large Satellite (444)	SAT-EPOCH-Minute: 0
CA_LPS_L	SAT-EPOCH-Seconds: 0
CA_LPS_L_002	Random Number: 0.9200

Courses Of Action

Key Word: COA-Limitations:
 Weapons: Mobile Direct Ascent ASAT COA-Success Criteria Value:
 Event-Full: Newmexia Ouro Mobile Direct Ascent ASAT (BE COA-Desired End State:
 Event-Succinct-1: Red Mobile Direct Ascent ASAT Destroy Attack COA-Seqe:
 Event-Succinct-2: Red Mobile Direct Ascent ASAT is Conducting a COA-Branch:
 Event-Succinct-3: Red Large Ground Mobile TEL is Conducting a COA-NAI-Name: Red Mobile Direct Ascent ASAT Destroy Attack
 Event-Succinct-4: Large Ground Mobile TEL is Conducting a Destr NAI-Name-Old:
 COA-Priority: NAI-Category:
 COA-Priority Reason: NAI-Type:
 COA-Purpose: NAI-Priority:
 COA-Likelihood: INTEL_Type_1: IMINT
 COA-Concept: INTEL_Type_2: MINT
 COA-Definition:

Microsoft Project Parameters

Start_Date: 4/22/2011 6:27:42 PM
 Finish_Date: 4/22/2011 7:06:28 PM
 Duration: 7 days
 Min_Duration: 1 day
 Most_Likely_Duration: 7 days
 Max_Duration: 14 days
 WBS_Predecessors:
 Predecessors:
 WBS_Successors:
 Successors:
 Unique_ID_Successors:
 Data Source: Paul Szymanski

Monte Carlo Parameters

@Risk_Function: Duration=RiskPERT([Min Duration],[Most likely Duration],[Max D
 @Risk_Min:
 @Risk_Mean:
 @Risk_Max:
 @Risk_Std_Dev:
 @Risk_Variance:
 @Risk_Skewness:
 @Risk_Unk:

Comments

Attacker-Description: Mobile ground system for ASAT missile launches. Operating e
 Attacker-Comments: Operation Bear Claw Scenario
 Target-Description: Large-sized photo imagery satellite at LEO sun-synchronous
 Target-Comments: Operation Bear Claw Scenario
 Comments:

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Record: 4272 of 6087

OK Cancel

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OB1-1 JST0-1 COA-1

Num Lock

Over 6,000 Available Space Systems
INTEL Indicators Reports

Thousands of Example INTEL Messages Can be Selected to set the Tempo of the Wargame

Random INTEL Situation Reports

Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools PS-Form-SIPB-5-6 Space Games Switchboard Space Games War Room Sheet Form Messages

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INTEL Report Messages

Setup Final Messages View Messages Export All Messages Send INTEL Messages Copy New Delete Find Close

Index: 8 WBS: T.6.9.3.1.1.11 Record Date: 4/19/2011 7:55:31 AM Use Always Use-Message Completed Systems-Red Scenario Name: Limited Technology Experiment Scenario Name-Sub:

Index-COA: 4859 Send On Off Data Change Date: 3/26/2009 8:00:00 AM Use Random Use-Send Hide Systems-Blue COA-Category: Tactic Conflict Level: Phase Var: Joint Counter-Offensive to Restore

Side: Red Sent On Off Changed: Use Never On Off Blank Systems-Gray COA-Type: Activity Type: Increased Military Activities

Use Note Launch-Maneuver Targeted System

Attacker System

BE Number: NA LAT:

BE Number-Base: LONG:

BE Number-Final: NA ALTITUDE:

Country: Newmex SMA:

Country-Final: UNK Eccentricity:

AOR: Inclination:

Region: RAAN:

Category: ARG:

Type: Anomaly:

Sub-Type: EPOCH-Year:

Mission-Final: EPOCH-Month:

Name-Full: EPOCH-Day:

Name-Public: EPOCH-Hour:

Name-Final: EPOCH-Minute:

Name-Small: EPOCH-Seconds:

Name-Small-Numbered: Event-Random #:

Targeted System

BE Number: LAT:

BE Number-Base: LONG:

BE Number-Final: ALTITUDE:

Country: Califon SMA:

Country-Final: Califon Eccentricity:

AOR: Inclination:

Region: RAAN:

Category: ARG:

Type: Anomaly:

Sub-Type: EPOCH-Year:

Mission-Final: EPOCH-Month:

Name-Full: EPOCH-Day:

Name-Public: EPOCH-Hour:

Name-Final: EPOCH-Minute:

Name-Small: EPOCH-Seconds:

Name-Small-Numbered: Event-Random #:

Microsoft Project Parameters

Start_Date: 4/22/2011 6:27:42 PM

Finish_Date: 4/22/2011 9:13:51 PM

Duration: 30 days

Min_Duration:

Most_Likely_Duration:

Max_Duration:

Data Source: Paul Szymanski

**Randomly Generated Space Systems
INTEL Indicators Reports**

Courses Of Action

Key Word:

Weapons: Mobile Direct Ascent ASAT

Event-Full: Newmexia Ouro Mobile Direct Ascent ASAT Garrison / Storage Sites

Event-Succinct-1: Red Mobile Direct Ascent ASAT Garrison / Storage Sites

Event-Succinct-2: Red Mobile Direct Ascent ASAT Garrison / Storage Sites

Event-Succinct-3: Red Mobile Direct Ascent ASAT Garrison / Storage Sites

Event-Succinct-4: Mobile Direct Ascent ASAT Garrison / Storage Sites

INTEL_Type_1: IMINT

INTEL_Type_2: COMINT

INTEL Message

FM: SATAC
TO: USAF AFMC AFRL/RDTE
INFO: USAF AFMC AFRL/RDTE

UNCLASS //
EXER / Limited Technology Exp //
SWAT T.6.9.3.1.1.11 / INTREP / SATAC / 22759432Apr11 //
IMINT / FM 22182742Apr11 TO 22211351ZApr11 / High Confidence //

Increased Military Activities //
LUNTIID/ATK: // BEN: NA / CTY: UNK / MSN: //

AOR: // LOC: //
EPOCH: // SMA: // ECC: // INC: //

RAN: // ARG: // ANOM: //

LUNTIID/TGT: // BEN: // CTY: Califon / MSN: //

AOR: // LOC/GEO: //
EPOCH: // SMA: // ECC: // INC: //

RAN: // ARG: // ANOM: //

GENTEXT: Red Mobile Direct Ascent ASAT Garrison / Storage Sites have New Command Centers Built / Activated that are has been Associated with Sites //

IND1: NA // IND2: NA //

IND3: NA // IND4: NA //

IND5: NA // IND6: NA //

IND7: NA // IND8: NA //

IND9: NA // IND10: NA //

INTEL Message

INTEL Msg: Sheet Form Sen Task: Sheet Form

INTEL Sum: Sheet Form Real Sys: Sheet Form

Red COA: Sheet Form Exer Sys: Sheet Form

Blue COA: Sheet Form Weapons: Sheet Form

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Record: 1 of 13 Unfiltered Search

OBT-1 JSTO-1 COA-1

View this data in spreadsheet format

Selected INTEL Messages Employed in Wargame

INTEL Tasking Development Tool

The screenshot displays the 'INTEL Tasking Development Tool' interface. The main window is titled '1.6.1 Recommended PIR's / EEI's / RFI's'. It features a navigation pane on the left and a main content area with various configuration fields. A 'View' dialog box is open on the right, showing a grid of options for different message types.

Message Configuration Fields:

- Record Number: 96, Side: Red
- PIR Number: 3.1.2.10
- Record Date: 1/8/2007 3:28:53 PM
- Data Source: ACE 10 Exercise
- Exercise or Operational?: EXER, RII, Message Type
- Scenario Name: Operation Blue Thunder
- STO Name: STO-1
- Analysis Name: COA-1
- Completed Date: 1/20/2010 2:25:48 PM
- PIR Category: Space
- PIR Type: Tactical PIR
- PIR Name: Status - Manash Space-Based Nano GEO M
- Supported Objective: Maintain Space Superiority to Control Advl
- PIR Priority: Low
- Priority Reason: General situational awareness
- Target-Type: Satellite-Unmanned
- Target-Name: IIMARSAT 3-F4
- SATCAT Number: 24819
- BE # / EXER Name: OR90F09012, OR Nano GEO Mine-Jammer
- Country: IMSO
- Mission: COMM-CIVIL - GEO - Active
- INTEL Collection Type 1: IMINT - Visible, Collection Start Time: 5/11/2010 8:00:00 AM, Now
- INTEL Collection Type 2: IMINT - IR, Collection End Time: 5/11/2010 11:00:00 PM, Now
- INTEL Collection Type 3: IMINT - MSI, Collection Duration: 13:52, Now
- INTEL Collection Type 4: SIGINT - ELINT - TELINT, Collection LTIOV: 5/12/2010 8:00:00 AM, Now
- INTEL Collection Type 5: MASINT - LASINT, Desired Collection Time: 5/11/2010 12:00:00 PM, Now
- Other Phase: (Fill In Below)
- Readiness Phase: Monthly, Crisis / Deployment Phase: Every Monday, Combat Phase: Hourly, Post-Conflict Phase: Monthly
- Collection Frequency: Monthly, Every Monday, Hourly, Monthly
- General Comments: Conduct full RPO of OR Manash Space-Based Nano GEO Mine-Jammer (BE OR90F09012) to determine probable military mission capabilities

View Dialog Box:

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

At the bottom of the interface, there are buttons for '0BT-1', 'JSTO-1', and 'COA-1'. The status bar shows 'UNCLASSIFIED' and 'Record: 1 of 22'.

Wargame Users Can Setup INTEL Request Messages

Unknown Space Object Automatic Mission Assessment Tool

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RSO Mission Assessment

Weight Scenario Name:

Use	RSO Name	Most Likely Mission	% Indicators	Comments
<input checked="" type="checkbox"/>	RSO-0035	COMM-CIVIL	77%	
<input type="checkbox"/>	RSO-0035	COMM-MIL	40%	
<input type="checkbox"/>	RSO-0035	COMM-JOINT	40%	
<input type="checkbox"/>	RSO-0035	SCIENCE	39%	
<input type="checkbox"/>	RSO-0035	NAVSAT	33%	
<input type="checkbox"/>	RSO-0035	COMM-MOBIL	33%	
<input type="checkbox"/>	RSO-0035	EARTH-RES	30%	
<input type="checkbox"/>	RSO-0035	COMM-TEST	30%	
<input type="checkbox"/>	RSO-0035	METSAT	25%	
<input type="checkbox"/>	RSO-0035	MSL-WARN	24%	
<input type="checkbox"/>	RSO-0035	MILITARY	22%	
<input type="checkbox"/>	RSO-0035	GEODETTIC	22%	
<input type="checkbox"/>	RSO-0035	MARS	16%	
<input type="checkbox"/>	RSO-0035	REMOTE-IMG	12%	
<input type="checkbox"/>	RSO-0035	TECHNOLOGY	12%	

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

Ranked List of Most Probable Assessments for Unknown Space Objects Based On Their Below Properties, & Matched to Satellite Characteristics Master Database

Definition

Satellite Description

Object Name: Score:

Delta-V: Length:

Drift Rate: Score: Width:

Stabilization: Height:

RCS Value: Score: Mass: Score: Power:

Visual Mag:

Optical Properties

Optics: Score:

Fladar: Score:

COMM: Score:

Retro:

Flashing:

Spin Rate:

Flash Period:

Two Line Element Set

Line 1	Score	Line 2	Score
1st Mean Motion: <input type="text" value="-0.00000035"/>	<input type="text" value="79%"/>	Inclination: <input type="text" value="0.0123"/>	<input type="text" value="89%"/>
2nd Mean Motion: <input type="text" value="0"/>	<input type="text" value="100%"/>	RAN: <input type="text" value="266.4489"/>	<input type="text" value="61%"/>
BStar: <input type="text" value="0.0001"/>	<input type="text" value="84%"/>	Eccentricity: <input type="text" value="0.0002184"/>	<input type="text" value="99%"/>
Altitude (KM): <input type="text" value="35,795"/>		Arg Perigee: <input type="text" value="194.9359"/>	<input type="text" value="72%"/>
Period (Min): <input type="text" value="1,436.1"/>		Mean Anomaly: <input type="text" value="133.6898"/>	<input type="text" value="78%"/>
Period (Hrs): <input type="text" value="23.9350"/>		Mean Motion: <input type="text" value="1.00271399"/>	<input type="text" value="90%"/>

UNCLASSIFIED

Record:

View this data in spreadsheet format

Num Lock Filtered

This SSA-T Tool Automatically Categorizes the Mission of Unknown Space Objects

Space Object State Change Automatic Detection Tool

Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard State Change Assessment Form Space Object Status Changes

UNCLASSIFIED Averages Orbital Graphs Live Set Use All On RCS-All Find Close
 Correl Chart Scores Degraded Ignore All Off RCS-Sat
 GEOSYNC Detail-1 Detail-2 Dead Interest Select
 SunSYNC Orbit-1 Orbit-2 Unknown SATCAT Table

View
 INTEL Msg: Sheet Form Sen Task: Sheet Form
 INTEL Sum: Sheet Form Real Sys: Sheet Form
 Red COA: Sheet Form Exer Sys: Sheet Form
 Blue COA: Sheet Form Weapons: Sheet Form

Space Object Status Changes

Index	Use	Interest	Ignore	Data Date	Mission	SAT No	Space Object Name	Characteristic	Mission-Now Correlation	Mission-All Correlation	Self Correlation	Overall Score	Ignore-Interest Reason
12219148	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18-Jun-13	COMM-CIVIL - LEO - Active	27834	MOLNIYA 3-53	1st Mean	9.92		0.10	3.7	Radically changing altitude starting on 4-18-13.
12225422	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18-Jun-13	OPTICAL - LEO-S - Active	36599	PRISMA (MANGO)	BStar	9.72	0.01	0.01	1.3	
11822855	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01-Apr-13	COMM-CIVIL - LEO - Active	38047	VESSELSAT 2	1st Mean	9.40		0.03	0.5	
11907907	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15-Apr-13	OPTICAL - LEO - Active	38256	TIANHUI 1-02	1st Mean	9.24		0.01	1.3	
11439064	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01-Feb-13	OPTICAL - LEO - Active	38707	KANOPUS-V 1	BStar	8.99	0.09	0.01	1.2	
10254795	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	02-Jul-12	OPTICAL - LEO-S - Active	35931	OCEANSAT 2	1st Mean	8.96		0.02	2.3	
10664552	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14-Sep-12	COMM-CIVIL - GEO-G-B - Active	26745	GSAT 1	Eccentricity	8.95		UNC	0.5	
11778940	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01-Apr-13	COMM-CIVIL - MEO - Active	26857	ICO F2	Mean Motion	8.93		0.05	1.1	
11050203	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15-Nov-12	ISR - LEO - Active	36413	YAOGAN 9A	Eccentricity	8.93	4.95	0.05	1.0	
12225209	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18-Jun-13	COMM-CIVIL - LEO-S - Active	29712	Pehuensat 1	1st Mean	8.88		0.03	1.2	
12229438	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18-Jun-13	TECHNOLOGY - LEO-S - Active	28060	SERVIS 1	Mass	8.88	5.43	0.00	0.7	
11733497	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13-Mar-13	EARTH IMAGING - LEO-S - Active	38011	SSOT	BStar	8.86	0.02	0.04	1.0	
10594859	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	03-Sep-12	OPTICAL - LEO - Active	37728	ORS 1 (USA 231)	1st Mean	8.85		0.04	1.8	
10636552	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14-Sep-12	IMETSAT - LEO-S - Active	29108	CALIPSO	1st Mean	8.82		0.01	1.3	
11787562	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01-Apr-13	COMM-CIVIL - MEO - Active	27707	MOLNIYA 1-92	1st Mean	8.73		0.09	2.3	
11431187	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01-Feb-13	NAVSAT - MEO - Active	37846	GALILEO-PFM	RCS	8.72	8.65	0.06	0.6	
10917704	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01-Nov-12	COMM-CIVIL - LEO - Active	37193	GLOBALSTAR M073	BStar	8.67	0.02	0.01	0.7	
12080342	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15-May-13	EARTH IMAGING - LEO - Active	36985	TIANHUI 1	BStar	8.64	0.30	0.00	1.5	
10287297	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	02-Jul-12	TECHNOLOGY - LEO-S - Active	35934	LUWE-2	BStar	8.62	0.47	0.00	1.0	
11823736	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01-Apr-13	ELINT - LEO - Active	36414	YAOGAN 9B	Eccentricity	8.53	7.81	0.05	1.3	
10408507	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27-Jul-12	NAVSAT - MEO - Active	37847	GALILEO-FM2	RCS	8.51	8.27	0.05	0.3	
10632651	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14-Sep-12	NAVSAT - GEO - Active	34779	BEIDOU G2	Eccentricity	8.51	9.00	0.03	0.7	
10582788	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	03-Sep-12	COMM-CIVIL - GEO - Active	26824	INTELSAT 901	Height	8.49		0.00	0.4	
11770679	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01-Apr-13	TECHNOLOGY - LEO-S - Active	32789	DELFI C3	1st Mean	8.45		0.03	1.2	
11884686	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15-Apr-13	COMM-CIVIL - GEO-G-A - Active	35493	SIRIUS FM-5	RAN	8.45	5.24	0.03	1.1	
11911387	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	01-May-13	SCIENCE - LEO-S - Active	27424	AQUA	Mass	8.42		0.00	1.5	
11997592	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15-May-13	SCIENCE - LEO-S - Active	27424	AQUA	Mass	8.42		0.00	1.5	

UNCLASSIFIED OBT-1 JSTO-1 COA-1

Record: 1 of 700 Filtered Search

View this data in spreadsheet format

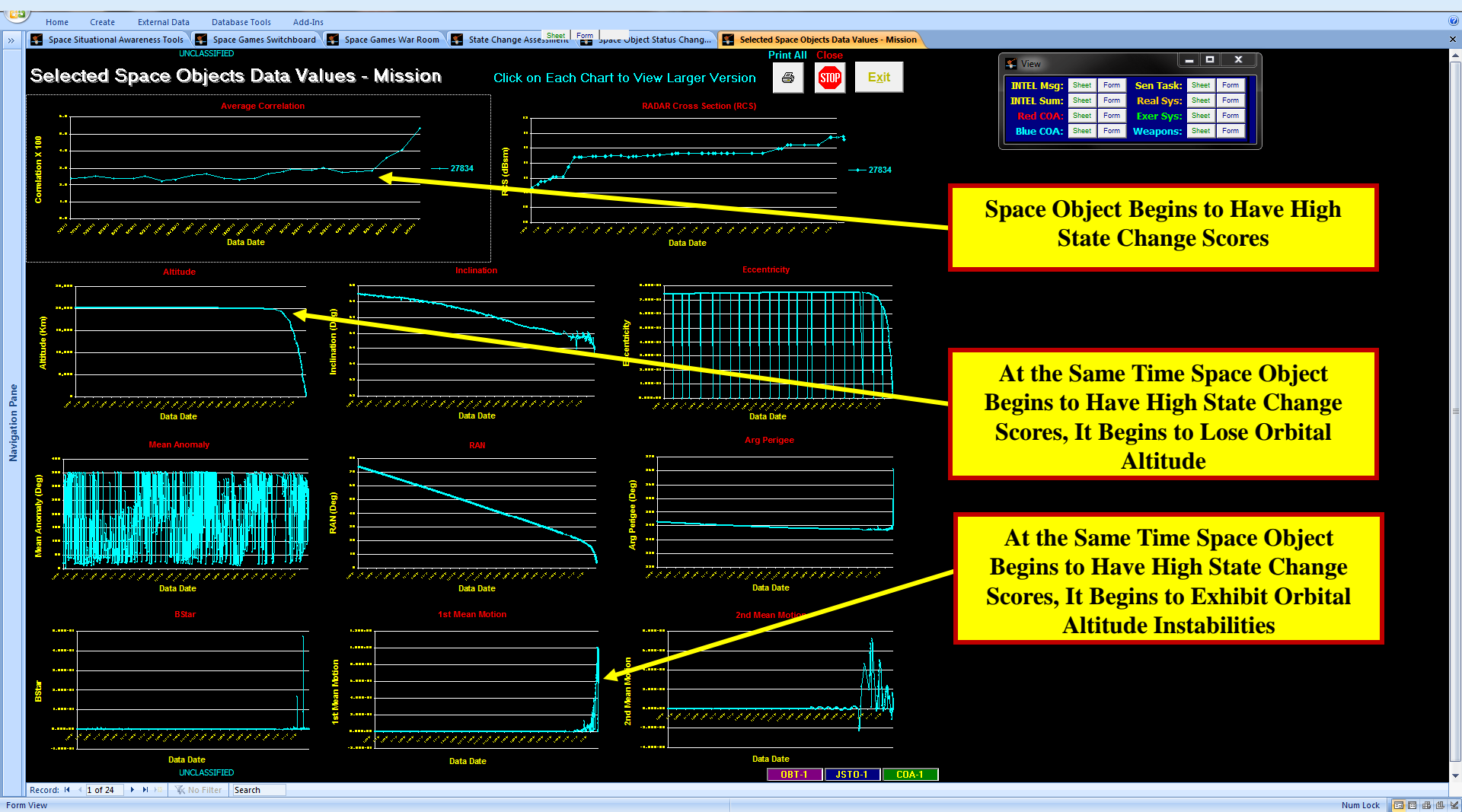
Num Lock Filtered

Ranked List of Those Space Objects That Have Changed the Most, Or Otherwise Appear Out of the Ordinary, Since the Last Calculation

The Higher the Correlation Score, the More the Space Object Has Changed, Or Lacks Similarity to Other Objects of Its Mission Class

This SSA-T Tool Automatically Detects Maneuvering or Changing Space Objects

Space Object State Change Automatic Detection Tool Statistics Graphs



Space Object Begins to Have High State Change Scores

At the Same Time Space Object Begins to Have High State Change Scores, It Begins to Lose Orbital Altitude

At the Same Time Space Object Begins to Have High State Change Scores, It Begins to Exhibit Orbital Altitude Instabilities

Details of Maneuvering or Changing Space Objects Can be Assessed

Countries With the Most Changes to Their Space Objects

The screenshot displays the SSA-T tool interface with two main data panels. The left panel, titled 'Live Space Object Status Changes - By Country', shows a table with the following data:

Country	Average Score
Taiwan	4.1
Russia	3.7
France	3.0
Sweden	3.0
India	2.4
ITSO	2.1

The right panel, titled 'Dead Space Object Status Changes - By Country', shows a table with the following data:

Country	Average Score
Russia	3.1
Japan	2.9
China	2.9
France	2.5
Sea Launch	2.3

A 'View' window is open, displaying a grid of options: INTEL Msg, INTEL Sum, Red COA, Blue COA, Sen Task, Real Sys, Exer Sys, and Weapons. A yellow callout box with a red border points to the top of both tables, containing the text: 'Ranked List for Those Countries Whose Space Objects Have the Highest State Change Scores. This May Mean They Are Setting Up for Space War Prior to Initiating Conflict on Earth'. The interface also includes a navigation pane on the left, a record count of 1 of 5, and a search bar.

This SSA-T Tool Automatically Shows Which Countries Have the Most Maneuvering or Changing Space Objects

Example Wargame Intelligence Warning Messages

The screenshot displays the 'INTEL Summary Messages' application window. At the top, there is a menu bar with options like 'Home', 'Create', 'External Data', 'Database Tools', and 'Add-Ins'. Below the menu, a toolbar contains buttons for 'Update Info', 'Details', 'Copy', 'New', 'Delete', 'Find', 'Close', and 'Exit'. The main interface is divided into several sections:

- Header:** 'UNCLASSIFIED' and 'INTEL Summary Messages'.
- Form Fields:**
 - Index: 4, Side: Red, WBS: T.1.2.6.1.6
 - Scenario Name: Operation Blue Thunder, Conflict Level: Phase 0: Pre-War Buildup
 - COA-Category: Strategic, COA-Type: Prelude to War, Activity Type: Increased Military Activities
- Attacker System:** BE Number-Final: NA, Country-Final: Orgonia, AOR: UNK, Mission-Final: UNK, Name-Final: UNK.
- Targeted System:** BE Number-Final: UNK, Country-Final: UNK, AOR: UNK, Mission-Final: UNK, Name-Final: UNK.
- Summary:** A text box containing intelligence text: "Orgonia has multiple indications of buildup of manufacturing capabilities for space control weapon systems including direct ascent ASAT's, laser blinders, RF jammers, sensor painters, and maintenance satellites."
- References:** Reference 1: T.1.2.3.2.1.17.2.1, Reference 2: T.1.2.6.1.2, Reference 3: T.1.2.7.1.23.14.
- Courses Of Action:** Event-Full: Orgonian Wasan Nano GEO Mine-Shrapnel Incr, INTEL_Type_1: HUMINT, INTEL_Type_2: IMINT.
- Situation:** Conflict Level Summary: Pre-War Buildup, Conflict Level Confidence: Low, Space Strategy Summary: NA, Space Strategy Confidence: NA, Space Tactic Summary: NA, Space Tactic Confidence: NA.

At the bottom of the window, there is a status bar showing 'UNCLASSIFIED' and 'Record: 1 of 3'. A small 'View' dialog box is open, showing a grid of buttons for 'INTEL Msg', 'INTEL Sum', 'Red COA', 'Blue COA', 'Sen Task', 'Real Sys', 'Exer Sys', and 'Weapons', each with 'Sheet' and 'Form' options.

The Wargame User can Setup INTEL Adversary Attack Messages

Space Courses Of Action (COA's) Tools

Helps Develop Space War Plans

Red Space COA's Automatic Estimation

Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard Space Games Data Development 5.6 Blue Course of Action Development 4.8 Course Of Action Situation

UNCLASSIFIED

4.8 Course Of Action Situation

Update Below Assessments INTEL Summary Messages Detail INTEL Summary Messages Popup Current Space INTEL Situation Copy New Delete Find Close Exit

Most Likely Conflict Level	% Indicators
Trans-Conflict	6.6%
Phase 0: Pre-War Buildup	1.8%
Phase Va: Joint Offensive to Capture Red C	0.8%
Phase Va: Joint Counter-Offensive to Resto	0.8%
Phase I: Deployment/Deterrence	0.2%

Most Likely Strategy	% Indicators
Sweep The Skies	15.4%
Hidden Negate	14.3%

Most Likely Tactic	% Indicators
Mobile Laser Blinder	2.1%
Mobile Direct Ascent ASAT	1.2%
Maintenance Satellite	1.1%
Mobile Ground Jammer	1.0%
Nano LEO Mine-Paint	0.5%

NAT Number	Key Word(s)	NAT Name	NAT Category	NAT Type	Detected	Red	Blue	Gray	Comments
T.2.4.1.10	Maintenance	Major Maneuver of Red Maintenance Satellite Towards			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
T.2.4.1.10	Maintenance	Major Maneuver of Red Maintenance Satellite Towards			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S.4.4.15.2.7	Anomalies	Multiple Blue satellites experiencing anomalies	Large Number of Indicators	Long Period	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S.4.4.15.2.7	Anomalies	Multiple Blue satellites experiencing anomalies	Large Number of Indicators	Long Period	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S.4.4.15.2.1	Maneuvering	Multiple Red satellites maneuvering closer to potential	Large Number of Indicators	Short Period	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S.4.4.15.2.1	Maneuvering	Multiple Red satellites maneuvering closer to potential	Large Number of Indicators	Short Period	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S.4.4.15.11.1	Sequence	Red ASAT forces appearing to line up in a sequence of	Small Number of Indicators	Long Period	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
S.4.4.15.11.1	Sequence	Red ASAT forces appearing to line up in a sequence of	Small Number of Indicators	Long Period	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
T.1.2.8.1.16	Attitude	Red Maintenance Satellite Increased Interest In Satelli			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.1.2.8.1.16	Attitude	Red Maintenance Satellite Increased Interest In Satelli			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.1.2.5.2.1.46	ASAT	Red Mobile Direct Ascent ASAT Garrison / Storage Sites			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.1.2.5.2.1.46	ASAT	Red Mobile Direct Ascent ASAT Garrison / Storage Sites			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.1.2.5.2.4.2	Increased Military Training	Red Mobile Direct Ascent ASAT Increased Military Train			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.1.2.5.2.4.2	Increased Military Training	Red Mobile Direct Ascent ASAT Increased Military Train			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.6.9.3.1.2.3.	Military Personnel Operating TEL	Red Mobile Direct Ascent ASAT Remote Surveyed Sites			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.6.9.3.1.2.3.	Military Personnel Operating TEL	Red Mobile Direct Ascent ASAT Remote Surveyed Sites			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.1.2.4.2.1.14	Jammers	Red Mobile Ground Jammers Garrison / Storage Sites Ir			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.1.2.4.2.1.14	Jammers	Red Mobile Ground Jammers Garrison / Storage Sites Ir			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.1.2.3.2.1.9	Laser Blinder	Red Mobile Laser Blinders Garrison / Storage Sites Impr			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.1.2.3.2.1.9	Laser Blinder	Red Mobile Laser Blinders Garrison / Storage Sites Impr			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
T.1.2.3.1.3.1	Laser	Red Mobile Laser Blinders Increased Attention from Civ			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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OBT-1 JSTO-1 COA-1

Record: 1 of 30 No Filter Search

View this data in spread sheet format

Num Lock

Most Probable Tactic Being Employed by Adversary, Based on Below INTEL Indicators

Most Probable Strategy Being Employed by Adversary, Based on Below INTEL Indicators

Most Probable Conflict Level Due to Adversary Actions, Based on Below INTEL Indicators

This SSA-T Tool Automatically Detects Adversary Courses Of Action (COA's) & Space Conflict Level

Blue Space Courses Of Action

5.6 Blue Course Of Action Development

Record Number: 129 Side: Red Scenario Name: Operation Blue Thunder

Effect Number: E-1 STO Name: STO-1

Record Date: 12/7/2013 9:25:55 AM Analysis Name: COA-1

Data Source: ACE 10 Exercise Completion Date: [] Completed

Effect Category: Diplomatic Target-Type: Space-Related Ground Facility

Effect Type: Diplomatic Pressure Target Name: Drari Salem Space Manufacturing Facility-South

Effect Name: Pressure Orgonia to cease space weapons SATCAT Number:

Effect Priority: 5.00 Update BE Number: OR90F36008

Effect Priority Reason: Critical to prevent escalation to war Country: Orgonia

Effect Success Indicator: Reduced industrial production of space we Mission: Facility - Manufacturing

Effect Description: Try convincing Orgonia to stop or reduce space weapons increased production rates to prevent arms buildup in region

Supported COA: Hidden Disrupt COA Number: 4.4.15.10

COA Category: Pre-Conflict COA Priority: Very High

COA Type: OCS-Deceive COA Priority Reason: Critical to preventing strategic surprise

COA Likelihood: Medium Probability COA Purpose: Red side loses confidence in his space systems

Effect Method	Category	Effect Start Time	Effect End Time
Diplomatic Request 1	Diplomatic	5/4/2010 9:25:55 AM	5/7/2010 11:59:59 PM
Economic Pressure 1	Economic	5/8/2010	5/14/2010 11:59:59 PM
Cyber Attack 1	Covert	5/15/2010	5/18/2010 11:59:59 PM
B-2 Search & Destroy Sortie 1	Destroy-Con	5/19/2010	5/20/2010 11:59:59 PM
GBU-24/B Flight 1	Destroy-Con	5/19/2010	5/20/2010 11:59:59 PM

Readiness Phase: Continuous Crisis / Deployment Phase: Continuous Combat Phase: Daily Post-Conflict: Monthly

Effect Frequency: Diplomatic Economic Destroy-Conventional Covert

General Comments: Deny Orgonia the ability to ramp up space weapons production; destroy their ability to produce new weapons during the con

0BT-1 JST0-1 COA-1

SSA-T Tools can Assist the User in Developing Space Courses Of Action (COA's)

Weapon Tasking Messages

Microsoft Excel interface showing a spreadsheet titled "Weapon Tasking Messages".

Navigation Pane: Home, Create, External Data, Database Tools, Add-Ins

Worksheet: 5.6 Blue Course Development

Buttons: Copy, New, Delete, Find, Close, Setup Final Tasking, View Tasking, Send Selected Tasking, Export All Tasking, Exit

Fields:

- Index: 129
- Scenario Name: Operation Blue Thunder
- Message Type: Weapon Tasking
- Record Date: 12/7/2013 9:25:55 AM
- STO Name: STO-1
- Exercise or Operational: EXER
- Side: Red
- Analysis Name: COA-1
- Data Source: ACE 10 Exercise

Weapon Tasking Message

```

FM: USAF AFMC AFRL/RDTE
TO: U.S. Department of State
INFO: USAF AFMC AFRL/RVES
//
EXER / Operation Blue Thunder / Pressure Orgonia to cease space weapons production / Hidden Disrupt //
E-1 / Diploma / Patel / 0792555ZDec13 //
Diplomatic Pres: / 5 / Critical to prevent escalation to war //
DESC: Try convincing Orgonia to stop or reduce space weapons increased production rates to prevent arms buildup in region //
IND: Reduced industrial production of space weapons //
CAT1: Diplomatic / TYP1: Diplomatic Request 1 / FM: 0492555ZMay10 TO: ##### //
CAT2: Economic / TYP2: Economic Pressure 1 / FM: 0800000ZMay10 TO: ##### //
CAT3: Covert / TYP3: Cyber Attack 1 / FM: 1500000ZMay10 TO: ##### //
CAT4: Destroy-Conventional / TYP4: B-2 Search & Destroy Sortie 1 / FM: 1900000ZMay10 TO: ##### //
CAT5: Destroy-Conventional / TYP5: GBU-24/B Flight 1 / FM: 1900000ZMay10 TO: ##### //
FREQ-READ: Continuous / FREQ-CRISIS: Continuous / FREQ-COMBAT: Daily / FREQ-Post-Conflict : Monthly //
CAT-READ: Diplomatic / CAT-CRISIS: Economic / CAT-COMBAT: Destroy-Conve / CAT-Post-Conflict : Covert //
UNITID: Drari Salem Space Manufacturing Facility-South / BEN: OR90F36008 / SSN: / CTY: Orgonia //
TYP: Space-Related Ground Facility / MSN: Facility -Manufacturing //
LAT-MIN: LAT-MAX: / LONG-MIN: LONG-MAX: / GEO-MIN: GEO-MAX: //
MM-MIN: MM-MAX: / INC-MIN: INC-MAX: / ECC-MIN: ECC-MAX: //
RAN-MIN: RAN-MAX: / ARG-MIN: ARG-MAX: / ANOM-MIN: ANOM-MAX: //
ROE-GND: Diplomatic / ROE-GND-SOURCE: ACE 10 Exercise / ROE-GND-COMMENT: Do not provoke the start of armed conflict //
ROE-AIR: Diplomatic / ROE-AIR-SOURCE: ACE 10 Exercise / ROE-AIR-COMMENT: Do not provoke the start of armed conflict //
ROE-SPACE: Diplomatic / ROE-SPACE-SOURCE: ACE 10 Exercise / ROE-SPACE-COMMENT: Do not provoke the start of armed conflict //
GENTEXT: Deny Orgonia the ability to ramp up space weapons production; destroy their ability to produce new weapons during the conflict; and covertly monitor and fi //

```

View window:

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

Record: 1 of 2 | No Filter | Search

Buttons: OBT-1, JSTO-1, COA-1

View this data in spreadsheet format

The Wargame User can Setup Blue Space Weapon Tasking Messages

Space Weaponneering

The Wargame User can Develop Detailed Optimized Space Weapons Plans

Weapon Assignments

Home Create External Data Database Tools Add-Ins
Space Situational Awareness Tools Space Games Switchboard Space Games War Room **Weapon Assignm** Sheet Form

UNCLASSIFIED Copy New Delete Find Close

Weapon Assignments

Delete All Records View Table Update All Records Setup All Attacks Calculate Maneuvers View Maneuvers Exit

Index: 6934 Rank: 0 Maneuver Date-Min: 10/30/2012 10:27:21 AM COA Start Time: 10/29/2012 10:27:21 AM
 Classification: UNCLASSIFIED JSTO: JSTO-1 Maneuver Date-Max: 11/4/2012 10:27:21 AM COA End Time: 11/5/2012 10:27:21 AM
 Record Date: 10/29/2012 10:27:21 AM COA: COA-1 Maneuver Date-Start: 10/31/2012 10:27:21 AM Exchange Rate: 0.0 2.5
 Scenario Name: Operation Blue Thunder Use Sides: Red Maneuver Date-On Target: 11/3/2012 10:27:21 AM

On Off Sensors Probabilities Time Delays Chaser

SSN-Chaser: 27430	Chaser Name-Full: HAIYANG 1	Kill-Type: N/A	Mass: 450
BE Number: CAS0F20005	Chaser Name-Final: UNK Large Satellite (67)	Kill-Pk-Permanent: 0.00	Lifetime: 15
BE Number-Final: UNK	Chaser Status: Active	Kill-Pk-Temporary: 0.00	Life Left: -430%
Chaser Country: Califon	Chaser Altitude: 800	Kill-Pk-Temporary-Time: 0.00	Orbital Change: 0.0%
Country-Final: Califon	Chaser Inclination: 98.3	Kill-Time: 0.00	State Change: 0.00
Chaser Region: SDR LEO-S	Chaser Eccentricity: 0.0010	Kill-Power: 0.00	State Change Reason:
Chaser Mission: Large Satellite - Radar	Chaser Longitude:	Kill-Shots: 0.00	Real Delta-V-Assumed: 30
Mission-Final: UNK	Chaser Range: 0	Vulnerability-Hit: 0.82	Exercise Delta-V: 863
Chaser Value: 3.9	Chaser Cost: \$406 M	Vulnerability-Laser: 0.66	Exercise Delta-V Left: 863
End Game Visibility Time Constraint: 10 Min	Vulnerability-Jammer: 0.62		

Target

SSN-Target: 27426	Target Name-Full: DIRECTV 5 (TEMPO 1)	Vulnerability-Hit: 0.83	Mass: 2,938
BE Number: CAS0F06003	Target Name-Final: UNK Micro Satellite (187)	Vulnerability-Laser: 0.78	Lifetime: 7
BE Number-Final: UNK	Target Status: Active	Vulnerability-Jammer: 0.73	Life Left: 44%
Target Country: Oigonia	Target Altitude: 35,792		Orbital Change: 0.0%
Country-Final: Oigonia	Target Inclination: 0.2		State Change: 0.00
Target Region: SDR GEO	Target Eccentricity: 0.0056		State Change Reason:
Target Mission: Micro Satellite - Inspector	Target Longitude: 0		Real Delta-V-Assumed: 874
Mission-Final: UNK	Target Cost: \$10 M		
Target Value: 3.9	Visibility Time: 10 Min		

Results Update

Start Time-Burn 1: 11/2/2012 2:38:57 PM	Delta-V-Burn 1: 0.00 K/s	End Time: 11/3/2012 9:42:23 AM	Maneuver Category: RPD
Start Time-Burn 2: 11/2/2012 4:12:19 PM	Delta-V-Burn 2: 2.30 K/s	Transit Time: 19.1 Hrs	Maneuver Type: In-Plane
Start Time-Burn 3: 11/2/2012 9:38:17 PM	Delta-V-Burn 3: 1.41 K/s	Start Time Difference: 52.2 Hrs	Errors:
Start Time-Burn 4: 11/3/2012 9:42:23 AM	Delta-V-Burn 4: -0.01 K/s	End Time Difference: 0.7 Hrs	Results Comments: Min Delta-V
Delta-V-Total: 3.73 K/s			

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Record: 14 of 50

OB-T-1 JSTO-1 COA-1

Chaser satellite number, UNK Name and Number, or Basic Encyclopedia (BE) number for the attacking space object - space object that will maneuver

Num Lock

View

INTEL Msg:	Sheet	Form	Sen Task:	Sheet	Form
INTEL Sum:	Sheet	Form	Real Sys:	Sheet	Form
Red COA:	Sheet	Form	Exer Sys:	Sheet	Form
Blue COA:	Sheet	Form	Weapons:	Sheet	Form

Attacking Satellite ("Chaser")

Attacked Satellite ("Target")

Attacking Satellite Maneuvering Statistics

50 Possible Attacks Currently Being Analyzed

This is the Space Weapons Assignment Screen

Optimized Space Weapon Courses Of Action (1)

Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard Space Games War Room Weapon Assignm Sheet Form Jesul Sheet Form

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Weapon Results

All Selected Min Time Min Delta-V Closest Start Closest End All On All Off Graphs SATCAT Copy New Delete Find Close Exit

Index: 6884 Rank: 0 Maneuver Date-Min: 10/30/2012 10:27:21 AM COA Start Time: 10/29/2012 10:27:21 AM

Classification: UNCLASSIFIED STO: JSTO-1 Maneuver Date-Max: 11/4/2012 10:27:21 AM COA End Time: 11/5/2012 10:27:21 AM

Record Date: 10/29/2012 10:27:21 AM COA: COA-1 Maneuver Date-Start: 10/31/2012 10:27:21 AM Exchange Ratio: 0.0 1.0 Setup Comments

Scenario Name: Operation Deep Blue Use: Side: Red Maneuver Date-On Target: 11/3/2012 10:27:21 AM

Cost Value: Sensors Probabilities Time Delays Chaser Orbital Coverage

SSN Chaser: 27430 Chaser Name-Full: HAYANG 1 Kill-Type: N/A Mass:

BE Number: CA90F20005 Chaser Name-Final: UNK Large Satellite (67) Kill-Pk-Permanent: 0.00 Lifetime:

BE Number-Final: UNK Chaser Status: Active Kill-Pk-Temporary: 0.00 Life Left:

Chaser Country: Calton Chaser Altitude: 800 Kill-Pk-Temporary-Time: 0.00 Orbital Change:

Country-Final: Calton Chaser Inclination: 98.3 Kill-Time: 0.00 State Change:

Chaser Region: SDR LEO-S Chaser Eccentricity: 0.0010 Kill-Power: 0.00 State Change Reason:

Chaser Mission: Large Satellite - Radar Chaser Longitude: Kill-Shots: 0.00 Read Delta-V-Assumed:

Mission-Final: UNK Chaser Range: 0 Vulnerability-Hit: 0.82 Exercise Delta-V:

Chaser Value: 3.9 Chaser Cost: \$405 M Vulnerability-Laser: 0.65 Exercise Delta-V Left:

End Game Chaser Visibility: 43% Min Vulnerability-Jammer: 0.62

SSN-Target: 27426 Target Name-Full: DIRECTV 5 (TEMPO 1) Vulnerability-Hit: 0.83 Mass:

BE Number: CA90F06003 Target Name-Final: UNK Micro Satellite (187) Vulnerability-Laser: 0.78 Lifetime:

BE Number-Final: UNK Target Status: Active Vulnerability-Jammer: 0.73 Life Left:

Target Country: Orgonia Target Altitude: 35,792 Orbital Change:

Country-Final: Orgonia Target Inclination: 0.2 State Change:

Target Region: SDR GEO Target Eccentricity: 0.0056 State Change Reason:

Target Mission: Micro Satellite - Inspector Target Longitude: Delta-V-Assumed:

Mission-Final: UNK Target Cost: \$10 M

Target Value: 3.9 Target Visibility: 3% Maximize

Start Time-Bun 1: 11/2/2012 2:38:57 PM Delta-V-Bun 1: 0.00 K/s End Time: 11/3/2012 9:42:23 AM Maneuver Category: RPD

Start Time-Bun 2: 11/2/2012 4:12:19 PM Delta-V-Bun 2: 2.30 K/s Transit Time: 19.1 Hrs. Maneuver Type: In-Plane

Start Time-Bun 3: 11/2/2012 9:38:17 PM Delta-V-Bun 3: 1.41 K/s Start Time Difference: 52.2 Hrs. Errors:

Start Time-Bun 4: 11/3/2012 9:42:23 AM Delta-V-Bun 4: -0.01 K/s End Time Difference: 0.7 Hrs. Results Comments: Min Delta-V

Delta-V-Total: 3.73 K/s

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Record: 18 of 704 Unfiltered Search

UNCLASSIFIED Copy New Delete Find Close Exit

Turn Off Negative Delta-V Turn Off Negative Value Turn Off Negative Cost

Index: 1 Keep Pk-Permanent: 0.5 Max TTC-Red: 10% Min

Use On Off Pk-Temporary: 0.5 Max TTC-Blue: 30% Max

Data Date: 10/29/2012 11:22:56 AM Closest Start Time: 2.0 Min TTC-Gray: 10% Min

Scenario Name: Operation Blue Thunder Closest End Time: 2.0 Min Data-Red: 5% Min

Scenario Short Name: ODB-1 Cost Ratio: 1.0 Max Data-Blue: 20% Max

JSTO Name: Rolling Disrupt Value Ratio: 1.0 Max Data-Gray: 5% Min

JSTO Short Name: STO-1 Delta-V: 1.0 Min Sensor-Red: 15% Min

Tactic Name: Tactic-1 Transit Time: 24.0 Min Sensor-Blue: 20% Max

Tactic Short Name: TAC-1 Comments: Baseline test case. All Sensor-Gray: 15% Min

Cost Ratio: 0.7 Value Ratio: 0.9

Sum of Chaser Costs: \$16,331 \$M Sum of Chaser Values: 170

Sum of Target Costs: \$11,329 \$M Sum of Target Values: 161

All Data-TTC-Sensor: 20% Min

Record: 1 of 1 No Filter Search

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OBT-1 JSTO-1 COA-1

Attack Optimization Tools

This is the Space Weapons Optimization Screen

Optimized Space Weapon Courses Of Action (2)

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Home Create External Data Database Tools Add-Ins

Space Situational Awareness Tools Space Games Switchboard Space Games War Room Weapon Assignm Sheet Form

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All Selected Min Time Min Delta-V Closest Start Closest End All On All Off Graphs SATCAT Copy New Delete Find Close Exit

Index: 6884 Rank: 0 Maneuver Date-Min: 10/30/2012 10:27:21 AM CDA Start Time: 10/29/2012 10:27:21 AM

Classification: UNCLASSIFIED STO: JSTO-1 Maneuver Date-Max: 11/4/2012 10:27:21 AM CDA End Time: 11/5/2012 10:27:21 AM

Record Date: 10/29/2012 10:27:21 AM COA: COA-1 Maneuver Date-Start: 10/31/2012 10:27:21 AM Exchange Rate: 0.0 1.0

Scenario Name: Operation Deep Blue Use: Side: Red Maneuver Date-On Target: 11/3/2012 10:27:21 AM

Cost Value

Sensors Probabilities Time Delays Chaser Orbital Coverage

SSN-Chaser: 27430 Chaser Name-Full: HAIYANG 1 Kill-Type: N/A Mass: Tactics Optimization

BE Number: CAS0F20005 Chaser Name-Final: UNK Large Satellite (67) Kill-Pk-Permanent: 0.00 Lifetime:

BE Number-Final: UNK Chaser Status: Active Kill-Pk-Temporary: 0.00 Life Left:

Chaser Country: Callion Chaser Altitude: 800 Kill-Pk-Temporary-Time: 0.00 Orbital Change:

Country-Final: Callion Chaser Inclination: 98.3 Kill-Time: 0.00 State Change:

Chaser Region: SDR LEO-S Chaser Eccentricity: 0.0010 Kill-Power: 0.00 State Change Reason:

Chaser Mission: Large Satellite - Radar Chaser Longitude: Kill-Shots: 0.00 Real Delta-V-Assumed:

Mission-Final: UNK Chaser Range: 0 Vulnerability-Hit: 0.82 Exercise Delta-V:

Chaser Value: 3.9 Chaser Cost: \$406 M Vulnerability-Laser: 0.66 Exercise Delta-V Left:

End Game Chaser Visibility: 43% Min Vulnerability-Jammer: 0.62

SSN-Target: 27426 Target Name-Full: DIRECTV 5 (TEMPO 1) Vulnerability-Hit: 0.83 Mass:

BE Number: CAS0F06003 Target Name-Final: UNK Micro Satellite (187) Vulnerability-Laser: 0.78 Lifetime:

BE Number-Final: UNK Target Status: Active Vulnerability-Jammer: 0.73 Life Left:

Target Country: Orignia Target Altitude: 35,792 Orbital Change:

Country-Final: Orignia Target Inclination: 0.2 State Change:

Target Region: SDR GEO Target Eccentricity: 0.0056 Kill-Time: 0.00 State Change Reason:

Target Mission: Micro Satellite - Inspector Target Longitude: 0 Delta-V-Assumed:

Mission-Final: UNK Target Cost: \$10 M Target Value: 3.9 Target Visibility: 3% Maximize

Start Time-Burn 1: 11/2/2012 2:38:57 PM Delta-V-Burn 1: 0.00 K/s End Time: 11/3/2012 9:42:23 AM Maneuver Category: RFD

Start Time-Burn 2: 11/2/2012 4:12:19 PM Delta-V-Burn 2: 2.30 K/s Transit Time: 19.1 Hrs. Maneuver Type: In-Plane

Start Time-Burn 3: 11/2/2012 9:38:17 PM Delta-V-Burn 3: 1.41 K/s Start Time Difference: 52.2 Hrs. Errors:

Start Time-Burn 4: 11/3/2012 9:42:23 AM Delta-V-Burn 4: -0.01 K/s End Time Difference: 0.7 Hrs. Results Comments: Min Delta-V

Delta-V-Total: 3.73 K/s

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Record: 18 of 704 Unfiltered Search

OBT-1 JSTO-1 COA-1

View

INTEL Msg: Sheet Form Sen Task: Sheet Form

INTEL Sum: Sheet Form Real Sys: Sheet Form

Red COA: Sheet Form Exer Sys: Sheet Form

Blue COA: Sheet Form Weapons: Sheet Form

UNCLASSIFIED Copy New Delete Find Close Exit

Turn Off Negative Delta-V Turn Off Negative Value Turn Off Negative Cost

Index: 1 Keep Pk-Permanent: 0.5 Max TTC-Red: 10% Min

Use On Off Pk-Temporary: 0.5 Max

Data Date: 10/29/2012 11:22:56 AM Closest Start Time: 2.0 Min

Scenario Name: Operation Blue Thunder Closest End Time: 2.0 Min

Scenario Short Name: ODB-1 Cost Ratio: 1.0 Max

JSTO Name: Rolling Disrupt Value Ratio: 1.0 Max

JSTO Short Name: STO-1 Delta-V: 1.0 Min

Tactic Name: Tactic-1 Transit Time: 24.0 Min

Tactic Short Name: TAC-1

Comments: Baseline test case.

Cost Ratio: 0.7 Value Ratio: 0.9

Sum of Chaser Costs: \$16,331 \$M Sum of Chaser Values: 170

Sum of Target Costs: \$11,329 \$M Sum of Target Values: 161

TTC-Blue: 5% Min

Data-Blue: 20% Max

Data-Gray: 5% Min

Sensor-Red: 15% Min

Sensor-Blue: 20% Max

Sensor-Gray: 15% Min

TTC-All: 20% Min

Data-All: 10% Min

Sensor-All: 20% Min

All Data-TTC-Sensor: 20% Min

UNCLASSIFIED

OBT-1 JSTO-1 COA-1

Results

Record: 1 of 1 No Filter Search

UNCLASSIFIED

Record: 18 of 704 Unfiltered Search

Number is unique and automatically increments with each new record

Num Lock

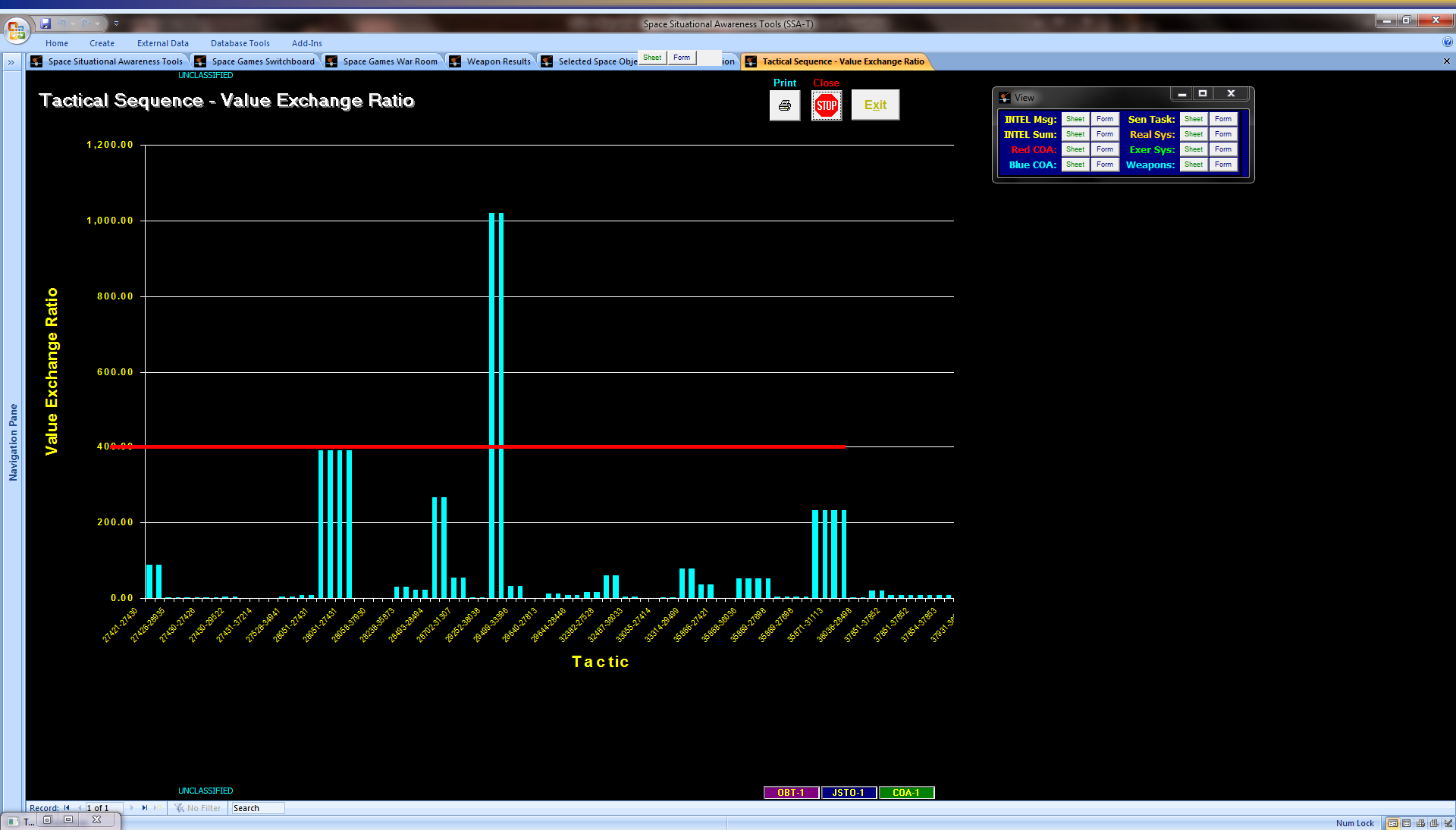
Space Weapons can be Optimized to Avoid Adversary Sensor Networks

Space Weapon Courses Of Action Optimization Statistics (1)



Space Weapons Attack Optimization Statistics Menu

Space Weapon Courses Of Action Optimization Statistics (3)



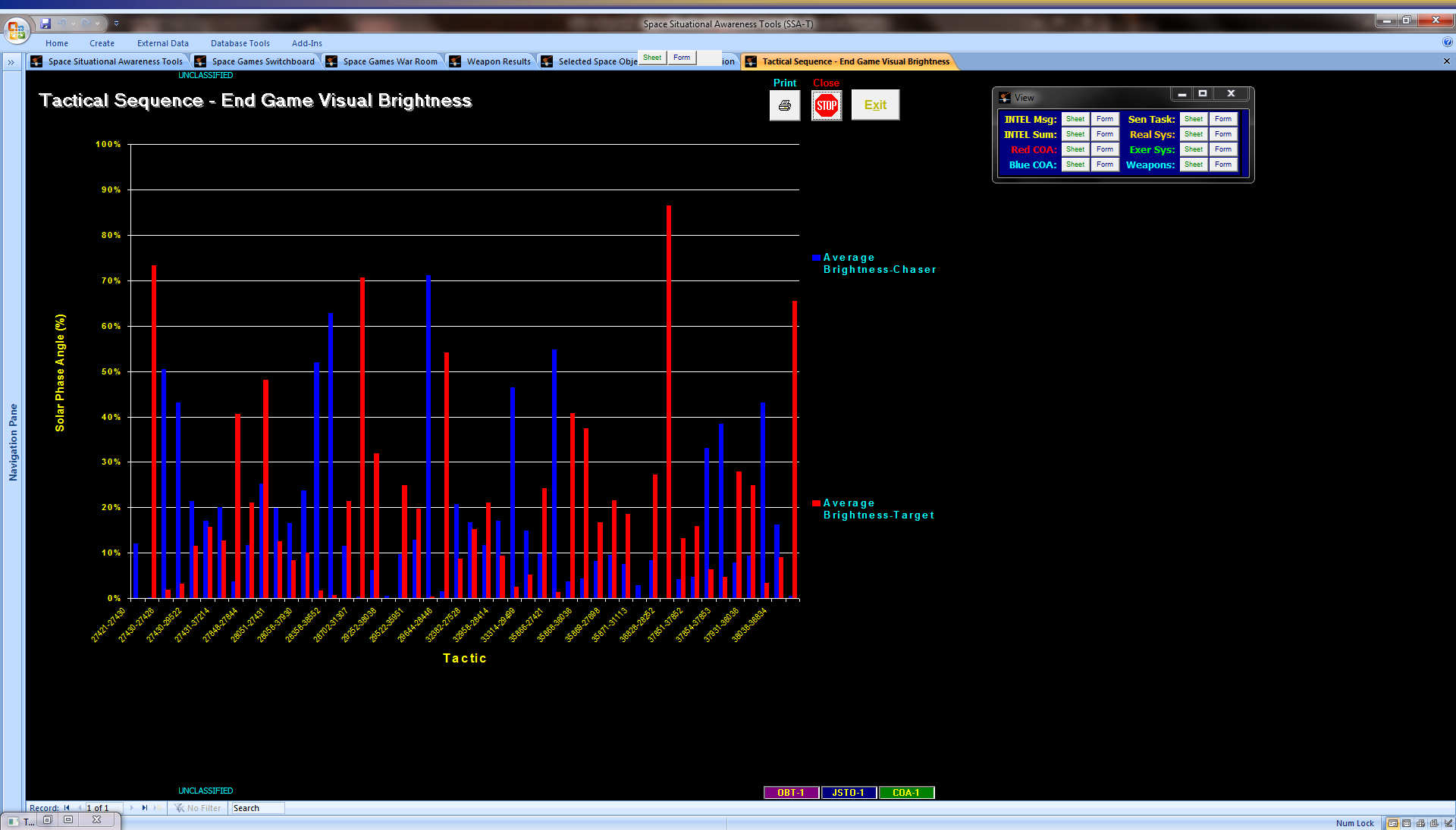
Space Weapons Attacks can be Optimized for Ratio of Target vs Expended Weapon Military Values

Space Weapon Courses Of Action Optimization Statistics (4)



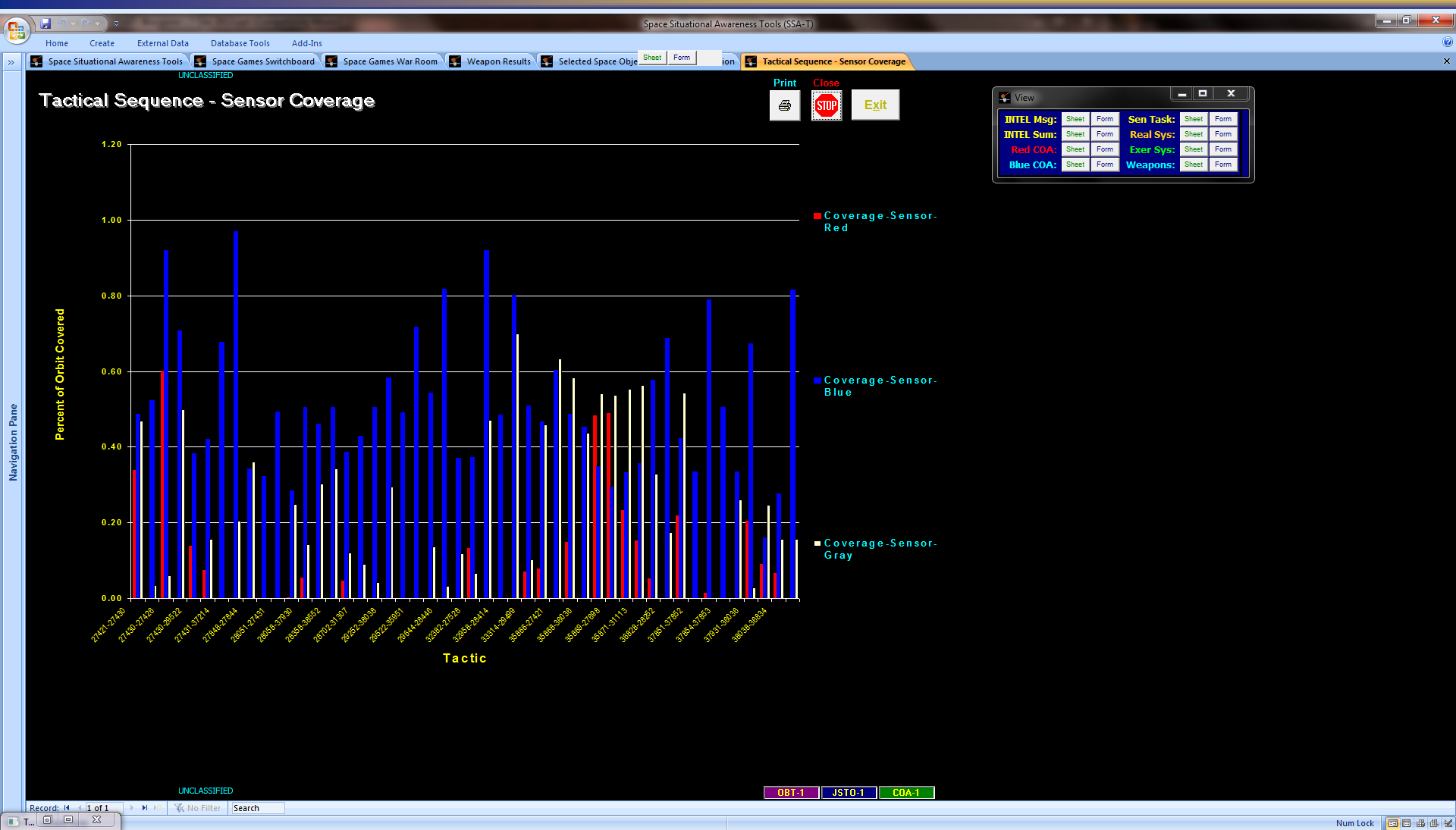
Space Weapons Attacks can be Optimized for Permanent vs Non-Permanent Kill Mechanisms

Space Weapon Courses Of Action Optimization Statistics (5)



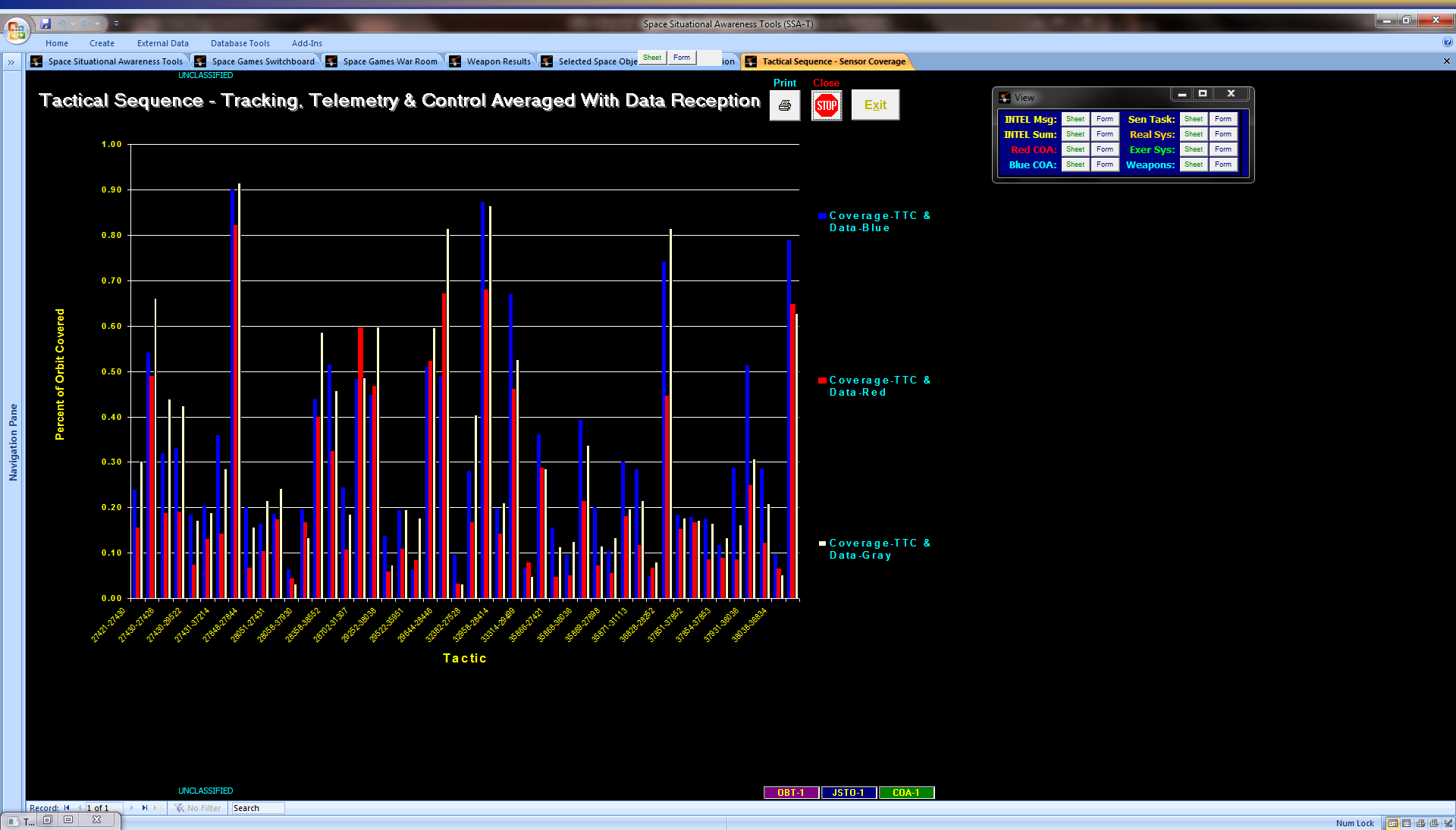
Space Weapons Attacks can be Optimized for Reduced Weapon Optical Signatures as Detected by Target

Space Weapon Courses Of Action Optimization Statistics (6)



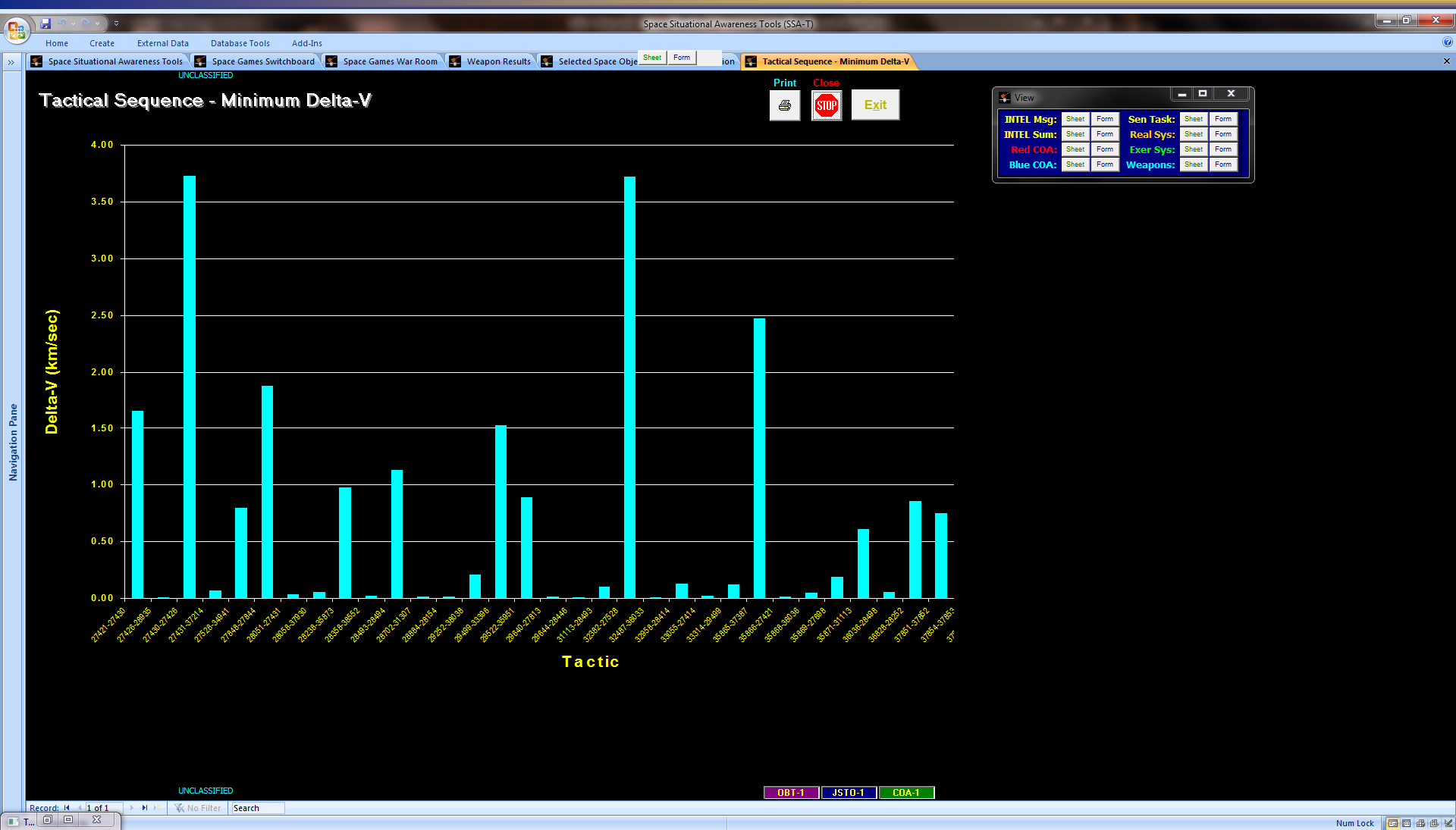
Space Weapons Attacks can be Optimized to Avoid Red Sensor Coverage

Space Weapon Courses Of Action Optimization Statistics (7)



Space Weapons Attacks can be Optimized to Maximize the Time Before the Red Sides Realizes Its Been Attacked

Space Weapon Courses Of Action Optimization Statistics (8)



Space Weapons Attacks can be Optimized for Minimizing Maneuvering Fuel

Space Weapon Courses Of Action Optimization Statistics (10)



How Close to Mission Planning Does Attacking Satellite Terminate Target (How Close Do All Attacks Reach Their Targets at the Same Time to Maximize Surprise.)

Space Weapons Attacks can be Optimized for Achieving Simultaneous Attack End Times

Space Weapon Courses Of Action Optimization Statistics (11)



How Close to Mission Planning Does Attacking Satellite Initiate Maneuver Burns (How Close Do All Attacks Start Their Attack Sequences at the Same Time to Maximize Surprise.)

Satellites Can Maneuver Only at Discrete Times

Space Courses Of Action Refinements

Additional Tools to Achieve Optimized Space COA's

Possible Space Strategies

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements Attack Strategies

UNCLASSIFIED Copy New Find Delete Close Space Strategies Briefing Exit

Title	Strategy	Desired End State	Comments
Funnel COMM	Selectively disrupt select Red space systems communications assets so that critical Red sensor and C4 info gets directed to communications paths with low data rates, effectively delaying receipt of critical data beyond its useful life.	Delay receipt of critical info while conserving space control weapons employment.	
Herd COMM	Selectively destroy or temporarily disrupt specific Red space systems communications assets so that critical Red sensor and C4 info gets directed to known paths that can be monitored by Blue sensors.	Make Red more vulnerable to intelligence exploitation.	
Herd Sensors	Temporarily deny Red space sensors, or only certain sensors. This will blind them, until they are allowed to use them again when Blue side wants them to observe certain fake Blue force dispositions. This directs Red sensors to see only what Blue	Control Red perception of Blue strengths and battlefield situation.	
Herd Space Personnel	Destroy all Red space-related ground targets, except purposely lightly damage one ground center. Assume that key space support personnel will converge to this lightly damaged site to conduct repairs. 12 hours later, use anti-personnel weapons at	Destroys Red country's most import space asset- key technically trained space personnel. Also sends message to international community that foreign personnel supporting Red space efforts will be at risk.	
Hidden Disrupt	Employ weapons with low probability of detection and attribution, to minimize world reaction to Blue side counter space. Temporarily disrupt spacecrafl operations at random times.	Red side loses confidence in his space systems. He is constantly kept off-balance by repeated disruption of his space capabilities. That are timed within his decision cycle times. Political implications of space control need	
Hidden Negate	Employ weapons with low probability of detection and attribution, to minimize Red perception that Blue has begun counter space operations. Slowly increase tempo of Red satellite disruption, starting with minor anomalies easily	Red probably hasn't used space systems in a real conflict before, and their decreasing reliability under combat stress might be understandable and acceptable to them.	
Periodic Degrade	Use degrade type of weapons whose attack cycles are timed to correspond with the reconstitution or replacement time of that target's capability.	As Red starts to bring on-line an alternate space capability, it is negated. This minimizes space weapons employment, but does not have as much shock value as a Sweep The Skies attack.	
Rolling Disrupt	Temporarily disrupt Gray space assets for small lengths of time, then move on to other Gray assets. Use low probability of detection and attribution weapons. This will give the impression of reliability issues with Gray equipment, not intentional attack.	Keep Gray side guessing as to the ultimate fate of their space systems if they continue to support Red side.	
Sweep The Ground	Destroy all prime Red space-related ground targets with a minimum of collateral damage.	With all ground sites destroyed, satellites cannot be tasked or download data. Probably a more politically acceptable solution, but space-related ground sites can be replaced easier than satellites after the war, and data	
Sweep The Skies	Destroy all Red satellites whether military, civil, or commercial, in a synchronized simultaneous attack so that Red protective/reconstitution measures cannot be implemented in time.	One large synchronized blow keeps red off balance.	

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Record: 1 of 10 No Filter Search

Form View Num Lock

Some Unique Space Strategies

Space Principles of War Assessment

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements **Space Principles of War**

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Copy New Find Delete Close

Space Strategies Briefing Exit

Space Principles of War

Direct every military operation toward a clearly defined, decisive, and attainable objective

Principle of War	Implemented?	Space Aspect	Percent Implemented	Comments
Objective	<input type="checkbox"/>	Have you considered whether your objectives are to take out a satellite only, or a total system capability that may be supported by both satellites and ground systems (integrated targeting)	28%	
Objective	<input checked="" type="checkbox"/>	Will taking out the space system be decisive in denying that category of information		
Objective	<input type="checkbox"/>	Does the attack have a measurable impact on the battlefield		
Objective	<input checked="" type="checkbox"/>	Have you considered which military objectives this system being attacked supports		
Objective	<input checked="" type="checkbox"/>	Is satisfaction of this objective achievable		
Objective	<input type="checkbox"/>	Are there branches and sequels to space control operations plans if they fail or if they are successful		
Offensive	<input type="checkbox"/>	Is there political will to start a space war at the beginning of conflict and seize the space initiative, or is taking out ground sites supporting space sufficient to achieve objectives		
Offensive	<input checked="" type="checkbox"/>	Are we setting the time, place and terms of the space battle		
Offensive	<input type="checkbox"/>	Does the battle tempo include space attacks on a continuing basis to keep the adversary off-balance		
Offensive	<input checked="" type="checkbox"/>	Can space weapons sustain continuous attacks		
Offensive	<input type="checkbox"/>	Is there a pre-approved ramp-up of space attack severity to exploit successes for further gain		
Mass	<input checked="" type="checkbox"/>	Are there sufficient weapons to achieve continuous, or sustained space control		
Mass	<input type="checkbox"/>	Have you considered that the adversary can re-configure to avoid attack		
Mass	<input checked="" type="checkbox"/>	Are the weapons employed overwhelming to the military function they are trying to deny		
Mass	<input type="checkbox"/>	Is there political will to implement massed space attack		
Mass	<input type="checkbox"/>	Can space weapons get into position at the decisive place and time		

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Record: 1 of 46 No Filter Search

Form View Num Lock

Fundamental Principles of War Applied to Space can be Assessed for Each COA

Space Courses Of Action Rules of Engagement

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements Rules of Engagement

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Rules of Engagement

Type Find Close Exit

Exercise?	NASA	SATCAT	NAIC	MIDB	NAIC Country Name	MIDB Country Name	Country Full Name	Highest Allowed Weapon Category	Comments
<input type="checkbox"/>	AFG	AF	AF	AF	Afghanistan	Afghanistan	Islamic State of Afghanistan	Diplomatic	
<input type="checkbox"/>						Africa			
<input type="checkbox"/>						Aland Islands		Diplomatic	
<input type="checkbox"/>	ALB	AL	AL	AL	Albania	Albania	Republic of Albania	Diplomatic	
<input type="checkbox"/>				OD		Albanian Kosovars		Diplomatic	Allegiance
<input type="checkbox"/>						Alcatel Space			
<input type="checkbox"/>	DZA	DZ	DZ	AG	Algeria	Algeria	People's Democratic Republic of Algeria	Diplomatic	
<input type="checkbox"/>		ALG				Algeria	People's Democratic Republic of Algeria	Diplomatic	
<input type="checkbox"/>	ASM	AS	AS	AQ	American Samoa	American Samoa	Territory of American Samoa	Administrative	
<input type="checkbox"/>	AND	AD	AD	AN	Andorra	Andorra	Principality of Andorra	Diplomatic	
<input type="checkbox"/>	AGO	AO	AO	AO	Angola	Angola	Republic of Angola	Diplomatic	
<input type="checkbox"/>	AIA	AI	AI	AV	Anguilla	Anguilla	None	Diplomatic	
<input type="checkbox"/>	ATA	AQ	AQ	AY	Antarctica	Antarctica	None	Diplomatic	
<input type="checkbox"/>	ATG	AG	AG	AC	Antigua & Barbuda	Antigua & Barbuda		Diplomatic	
<input type="checkbox"/>					Consortium-APT	APT		Economic	
<input type="checkbox"/>		AB			Consortium-ARABSAT	ARABSAT	Arab Satellite Communications Organizatio	Indirect Terrestrial Attac	
<input type="checkbox"/>		AB			Consortium-ARABSAT	ArabSat	Arab Satellite Communications Organizatio	Indirect Terrestrial Attac	
<input type="checkbox"/>	ARG	ARGN	AR	AR	Argentina	Argentina	Argentine Republic	Diplomatic	
<input type="checkbox"/>					Consortium-ARGOS	ARGOS		Legal	
<input type="checkbox"/>	ARM	AM	AM	AM	Armenia	Armenia	Republic of Armenia	Diplomatic	
<input type="checkbox"/>	ABW	AW	AW	AA	Aruba	Aruba	None	Diplomatic	
<input type="checkbox"/>					Ascension Islands	Ascension Islands		Diplomatic	
<input type="checkbox"/>				AT		Ashmore And Cartier Islands		Diplomatic	
<input type="checkbox"/>					Consortium-ASI	ASI		Economic	
<input type="checkbox"/>		AC			Consortium-ASIASAT	AsiaSat	Asia Satellite Telecommunications Compar	Economic	
<input type="checkbox"/>		AC			Consortium-ASIASAT	ASIASAT	Asia Satellite Telecommunications Compar	Economic	
<input type="checkbox"/>					Consortium-ASTROLINK	ASTROLINK		Economic	
<input type="checkbox"/>	AUS	AUS	AU	AS	Australia	Australia	Commonwealth of Australia	Diplomatic	
<input type="checkbox"/>	AUT	AT	AT	AL	Austria	Austria	Republic of Austria	Diplomatic	
<input type="checkbox"/>	AZE	AZ	AZ	AJ	Azerbaijan	Azerbaijan	Republic of Azerbaijan	Diplomatic	
<input type="checkbox"/>	BHS	BS	BS	BS	Bahamas	Bahamas	Commonwealth of the Bahamas	Diplomatic	
<input type="checkbox"/>	BFA	BF	BF	BF	Burkina Faso	Bahamas	Commonwealth of the Bahamas	Diplomatic	
<input type="checkbox"/>	BHR	BH	BH	BA	Bahrain	Bahrain	State of Bahrain	Diplomatic	
<input type="checkbox"/>				FQ		Baker Island	None	Diplomatic	
<input type="checkbox"/>	BGD	BD	BD	BG	Bangladesh	Bangladesh	People's Republic of Bangladesh	Diplomatic	

Record: 1 of 520 No Filter Search

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Is this country actually only an exercise name, and does not really exist

Num Lock

Each Space COA Must Follow Commander's Intent & Legal Rules of Engagement

Ranked Space Weapon Types

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements Rules of Engagement **Weapon Types**

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Country Find Close

Weapon Types

Weapon Severity Order	Weapon Type	Phase	Description
1	Masking	1st Wave	Hiding, camouflaging or moving out of way of sensor, keeping information from being sensed
2	Administrative	1st Wave	Request by administrative (i.e. from one government agency to another) means for not allowing the system to be used by an adversary
3	Diplomatic	1st Wave	Request by diplomatic means for not allowing the system to be used by an adversary
4	Economic	1st Wave	Use economic carrots and sticks
5	Legal	1st Wave	Request by legal means (whether by local or World Court) to not allowing the system to be used by an adversary
6	Covert	2nd Wave	Special terrestrial attack by covert or special forces means
7	Indirect Terrestrial Attack	2nd Wave	Attack a non-space related ground target to influence adversary to not use satellites
8	Delay	3rd Wave	Time delay induced on functionality of node
9	Deny	3rd Wave	Temporary and partial effect
10	Disrupt	3rd Wave	Temporary and total effect
11	Degrade	4th Wave	Permanent (until replacement/reconstitution) and partial effect
12	Destroy-Conventional	4th Wave	Permanent (until replacement/reconstitution) and total effect using conventional weapons
13	Destroy-Space	5th Wave	Permanent (until replacement/reconstitution) and total effect using weapons attacking satellites
14	Destroy-NBC	6th Wave	Permanent (until replacement/reconstitution) and total effect using nuclear, biologic, or chemical weapons
0			

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Record: 1 of 14 No Filter Search

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Some Weapon Types are More Escalatory to the Conflict than Others

Space Strategies-to-Task Hierarchy

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements **Courses of Action**

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Course of Action

COA 1

Optimize COA

Space Strategies

Copy New Find Delete Close Exit

Courses of Action

Objective Type/#	Objective	Purpose	Concept	Goals	Limitations	Data Source
National Goal NG.1	Maintain the sovereignty, political freedom, and independence of the U.S. with its people, and its territory					Szymanski
National Security Objective NS.1	Protect the U.S., its people, and its territory					
National Military Objective	Deter or defeat military attacks against U.S. allies, friends, and interests					RAND Strategies to Task
Conflict Level	Major Theater War					RAND Strategies to Task
Campaign Phase	Space Superiority					RAND Strategies to Task
Campaign Objective	Suppress national capacity to wage war					RAND Strategies to Task
Operational Objective 5.5.	Damage/destroy national communications infrastructure				None	Derived from: Space Control Mission Area Plan FY 04 and Beyond, 18 January 2002
Operational Task 4.4.	Determine Attitude of Space Object				None	Derived from: Space Control Mission Area Plan FY 04 and Beyond, 18 January 2002
Operational Sub-Task 2.3.2.1.	Intermittently Jam Command Signals of Resident Space Object				Do not approach target satellite closer than 10 meters	Derived from: Space Control Mission Area Plan FY 04 and Beyond.
Success Criteria 2.3.2.1.	Adversary denied satellite COMMM over ADR	Prevent adversary from determining coming coalition attack	Increase time and resources required for adversary to gather information on coalition		Do not damage adversary satellite	Szymanski
Success Indicator 2.3.2.1.	Less than 10% remaining traffic on satellite COMMM over ADR	Prevent adversary from determining coming coalition attack	Increase time and resources required for adversary to gather information on coalition		Target satellite has no apparent irreversible damage	Szymanski

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Record: 1 of 1

Form View

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Another COA Development Methodology is to Use RAND Strategies-to-Task Hierarchies

Space Mission Objectives Optimization Rankings

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements Courses of Action **Optimize Course of Action**

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Optimize Course of Action Course of Action: COA 1 Space Strategy Name: Hidden Disrupt

Execute COA Space Strategies

Objective Type/#	Objective	Purpose	Concept	Goals	Limitations	Data Source
Operational Sub-Task 2.3.2.1.	Intermittently Jam Command Signals of Resident Space Object				Do not approach target satellite closer than 10 meters	Derived from: Space Control Mission Area Plan FY 04 and Beyond.
Success Criteria 2.3.2.1.	Adversary denied satellite COMM over ADR	Prevent adversary from determining coming coalition attack	Increase time and resources required for adversary to gather information on coalition		Do not damage adversary satellite	Szymanski
Success Indicator 2.3.2.1.	Less than 10% remaining traffic on satellite COMM over ADR	Prevent adversary from determining coming coalition attack	Increase time and resources required for adversary to gather information on coalition		Target satellite has no apparent irreversible damage	Szymanski

Comments

Minimize Distance to Rendezvous:	5		5
Minimize Time to Rendezvous:	7		7
Minimize Fuel Used:	3		3
Maximize Blue Surveillance Access:	7		7
Maximize Blue AFSCN Access:	4		4
Minimize Red Surveillance Access:	8		8
Maximize Sun Blinding of Target:	5		5
Maximize Solar Cell Charging:	4		4
Minimize Solar Heating:	6		4
Maximize Sun Illumination of Target:	7		7
Minimize Passing Through Natural Radiation Belts:	7		6
Minimize Passing Through Man-Made Radiation Belts:	6		6
Maximize Target Elset Accuracy:	6		8
Maximize Target Vulnerability:	8		7
Minimize Target Political Sensitivity:	7		5
Minimize Target Contamination:	5		8
Minimize Target Collision Avoidance:	8		

Total 100

How Important Are These Factors Relative to Each Other for Optimized Space COA Implementation

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Record: 1 of 1 No Filter Search

Form View Num Lock

There are Many Means of Optimizing Space COA's

Space Weapon Orbital Engagement (Target Parameters)

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements Courses of Action Optimize Course of Action Execute Space Mission Target Engagement Scenarios

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Scenario Name: Normal

Copy New Find Delete Close

Prime Record Date: 11/6/2003 10:20:17 PM

Object Catalog #: 10967 Model Name: DMSP

Start Times: Year: 2003, Month: 11, Day: 6, Hour: 22, Minute: 20, Second: 17.000000

Object Position: LVLH Displacement: X: +00000.00, Y: +00000.00, Z: +00000.00

Object Thrusting: LVLH Velocity: X: +00000.00, Y: +00000.00, Z: +00000.00; Body Fixed Thrust: X: +000.0000, Y: +000.0000, Z: +000.0000

Overall Comments

Euler Angles: Euler Angle Sequence: 1: 3, 2: 2, 3: 1; Euler Angle Frame: 1; Euler Angle: 1: +090.00, 2: +000.00, 3: +000.00

ECI Parameters: ECI Radius: 1: +006633.9833, 2: +000475.8245, 3: +002601.4136; ECI Velocity Vector: 1: -0002.3908, 2: -0002.6583, 3: +0006.5617

Starting Mass: Max Dry Mass: +002000.00, Max Payload Mass: +000150.00, Max Main Ox Mass: +001500.00, Max Main Fuel Mass: +001500.00, Max RCS Primary Mass: +000105.00, Max RCS Vernier Mass: +000025.00

Current Mass: Current Payload Mass: +000150.00, Current Main Ox Mass: +000700.00, Current Main Fuel Mass: +000690.00, Current RCS Primary Mass: +000082.00, Current RCS Vernier Mass: +000020.00

Angular Velocities: Angular Velocity Stability: 1; Angular Velocity: X: +000.258500, Y: +000.004167, Z: +000.011333

Body Moments & Torques: Moment of Inertia: X: +00200.0, Y: +00800.0, Z: +00200.0; Body Torque: X: +000.0000, Y: +000.0000, Z: +000.0000

Runge Kutta Integrator: ELSET Use: 1, Propagator Model: 1, Scale Fudge Factor: 01.000000, Integrator T-Zero: +0000.00, Integrator Duration: 00.1, Integrator N-Steps: 01

Other Parameters: Write Trajectory: 0, Next Color: 1, Next Shape: 1, Next Ob Angle: 1, Next Vector: 3, Collisions: 0

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Record: 1 of 3

NORAD TAIL NUMBER (SSCN)

Num Lock

Specific Physics Parameters of Space Attacks for the Targeted Space Object

Space Weapon Orbital Engagement (Weapon Parameters)

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements Courses of Action Optimize Course of Action Execute Space Mission Chaser Engagement Scenarios

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Scenario Name: Normal

Copy New Find Delete Close

Prime Record Date: 11/6/2003 10:21:19 PM

Chaser Engagement Scenarios **Update**

Object Catalog # 10967 Model Name DMSP

Calculate Desired Thrust

Overall Comments

Start Times

Year: 2003
 Month: 11
 Day: 6
 Hour: 22
 Minute: 21
 Second: 19.000000

Object Position

LVLH Current-X: +00012.00
 LVLH Current-Y: +00000.00
 LVLH Current-Z: +00000.00
 LVLH Desired-X: +00020.00
 LVLH Desired-Y: +00040.00
 LVLH Desired-Z: +00000.00

Object Thrusting

LVLH Desired Velocity-X: 1.6937E-19
 LVLH Desired Velocity-Y: 1.2978E+13
 LVLH Desired Velocity-Z: 2.0957E-03
 Body Fixed Thrust-X: +000.0000
 Body Fixed Thrust-Y: +000.0000
 Body Fixed Thrust-Z: +000.0000

Euler Angles

Euler Angle Sequence-1: 3
 Euler Angle Sequence-2: 2
 Euler Angle Sequence-3: 1
 Euler Angle-Frame: 1
 Euler Angle-1: +180.00
 Euler Angle-2: +000.00
 Euler Angle-3: +000.00

EOI Parameters

EOI Radius-I: +006633.9833
 EOI Radius-J: +000475.8245
 EOI Radius-K: +002601.4136
 EOI Velocity-Veclat-I: -0002.3908
 EOI Velocity-Veclat-J: -0002.6583
 EOI Velocity-Veclat-K: +0006.5617

Starting Mass

Max Dry Mass: +002000.00
 Max Payload Mass: +000150.00
 Max Main Ox Mass: +001500.00
 Max Main Ox Mass: +001500.00
 Max RCS Storage Mass: +000105.00
 Max RCS Vernier Mass: +000025.00

Current Mass

Current Payload Mass: +000150.00
 Current Main Ox Mass: +000700.00
 Current Main Fuel Mass: +000690.00
 Current RCS Storage Mass: +000082.00
 Current RCS Vernier Mass: +000020.00

Angular Velocities

Angular Velocity-Stability: 1
 Angular Velocity-X: +000.000000
 Angular Velocity-Y: +000.000000
 Angular Velocity-Z: +000.000000

Body Moments & Torques

Moment of Inertia-I: +02200.5
 Moment of Inertia-J: +05500.6
 Moment of Inertia-K: +09900.7
 Body Torque-X: +000.0000
 Body Torque-Y: +000.0000
 Body Torque-Z: +000.0000

Runge Kutta Integrator

Use 1-Law: 1
 Dragged Mass: 1
 Drag-Poly Order: 01.000000
 Integrator T-Zero: +0000.00
 Integrator Duration: 00.1
 Integrator N-Steps: 01

Other Parameters

Start Time: 0
 Max Alt: 1
 Max Range: 1
 Max Alt Angle: 1
 Max Velocity: 3
 Collisions: 0

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Record: 1 of 2 No Filter Search

NORAD TAIL NUMBER (SSCN) Num Lock

Specific Physics Parameters of Space Attacks for the Attacking Satellite (Rendezvous)

Space Situational Awareness (SSA) Optimization Tools

SSA-T Tools to Help Optimize & Manage Space Sensor Tasking

SSA Optimization Main Menu Screen

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Space Situational Awareness (SSA) Requirements Tracking

Close

Exit

Chose a Space Object for Viewing on Subsequent Graphs

SATCAT No: 28924

1 Chose Space Objects of Interest

2 Choose SSA Requirements

3 Update All Tables

4 View All Requirements

5 View Summary Graphs

6 View Recommended INTEL Collection

7 View Optimized INTEL Collection by Face

8 Export All to Excel

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OBT-1 JSTO-1 COA-1

Mark Target in the space catalog for those objects the user wants to analyze Space Situational Awareness (SSA) requirements satisfaction

Num Lock

Manage Space Sensor Tasking

SSA Requirements Matrix

The screenshot displays the 'SSA Requirements Summary' window of the 'Space Situational Awareness Tools (SSA-T)'. The interface includes a top navigation bar with tabs for 'Space Warning and Assessment Tools', 'Space Situational Awareness Tools', 'Military Requirements', 'Space Situational Assessment Requirements Tracking', and 'SSA Requirements Summary'. The main area is divided into several sections:

- Configuration Section:** Contains fields for Record Number (1684), Record Sequence (172), Requirement # (3.3.1.1.1.19.1.6.1), Tracking #, Record Date (1/15/2007 2:52:00 PM), Data Source (Paul Szymanski), Source Category (SWAT-JSpOC), Breakpoint, Scenario Name (Baseline), STO Name (STO-1), Analysis Name (COA-1), Completion Date (1/15/2007 2:52:00 PM), Requirement Category, How Exploit (System-2), Requirement Priority, Requirement Weight 1 (5), Requirement Weight 2, Satellite Priority (4), Total Weight (12.5%), and Intel System (System-2). There are also checkboxes for 'Implement', 'Confirmed', 'Use to Plan', 'Use', 'Updated', 'Completed', 'SWAT Requirement', 'Ownership', 'Endurance', 'JSpOC Requirement', 'Mission', 'Status', 'Other Requirement', 'Mobility', 'Support To Space System', 'Terrestrial Sensors', 'Reach', 'Support From Space System', 'Space Based Sensors', 'Timelines', and 'Vulnerabilities'.
- Level 1-10 Evaluation Section:** A list of requirements from Level 1 to Level 10, such as 'Evaluate the Adversary', 'Determine the current adversary situation', 'Composition', 'Generic satellite characteristics', 'Characteristics that uniquely identify it and distinguish it from other space vehicles', 'Power', 'Solar panels', 'Solar panel power', and 'Solar panels beginning of life power'. Each level has a corresponding input field.
- Desired End Effect and Significance Section:** Fields for 'Desired End Effect', 'Red Military Significance', 'Blue Military Significance', 'Data Utility', and 'Broad INTEL Requirement'.
- INTEL Derived From Section:** Fields for 'Detailed INTEL Requirements', 'INTEL Derived From', 'INTEL Indicators', and 'Success Criteria'.
- NIIRS Definition Section:** Fields for 'NIIRS Definition', 'Space NIIRS', 'Resolution Requirements', 'Required Technology', 'Main Detection Means', 'Responsibility', and 'Main Comments'.
- Table Section:** A table with columns: SSN # (26863), Satellite Name (ARTEMIS), Operational Mission (COMM-TEST - Active), and Mission Score (0.0%). Below the table are sections for 'Recommended Satellite Face to Observe', 'Best Space Object Face to Observe Required Data', 'Actual Space Object Face Observed', 'Recommended Minimal Required Lighting', 'Solar Illumination Definition', 'Previously Known Data', 'Currently Discovered Data', and 'Intelligence Collection Procedures'.

Space Sensor Requirements Ranked & Optimized

Delineates Space Situational Awareness (SSA) Requirements Details

SSA Sensor Optimization Graphs (1)

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements Space Situational Assessment Requirements Tracking SSA Requirements Summary SSA Requirements Tracking Graphs

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SSA Requirements Tracking Graphs Click on Each Chart to View Larger Version

Close STOP Exit

Number of Requirements Satisfied by Detector Location

Detector Location	Number of Requirements Satisfied
Radar	274
Thermal	288
Infrared	441
Photometric	341

Source of Requirements

Source of Requirements	Number of Requirements
Radar	71
Thermal	102
Infrared	441
Photometric	511

Number of Requirements Satisfied

Category	Value
Unknown	274, 25%
Complete	102, 40%

Requirements Completed

Space Object Catalog Number	Requirements Completed
10,000	10,000

Recommended Satellite Faces to Observe

Recommended Satellite Face to Observe	Count
1	1
2	2
13	13
11	11
101	101

Recommended Observation Lighting Quality

Recommended Observation Lighting Quality	Count
48	48
77	77
103	103
107	107

Click On Each Graph to View Details

Required Observation Resolution

Space Object Catalog Number	Required Observation Resolution
1	17
3	11
4	11
5	13
6	15
7	11
8	11
9	11
10	11
15	11
20	11
30	11
40	11
50	11
60	11
70	11
80	11
90	11
100	11

Recommended Range to Observe

Recommended Range to Observe (km)	Count
10	77
20	77
30	77
40	77
50	77
60	77
70	77
80	77
90	77
100	77
150	77
200	77
300	77
400	77
500	77
600	77
700	77
800	77
900	77
1000	77

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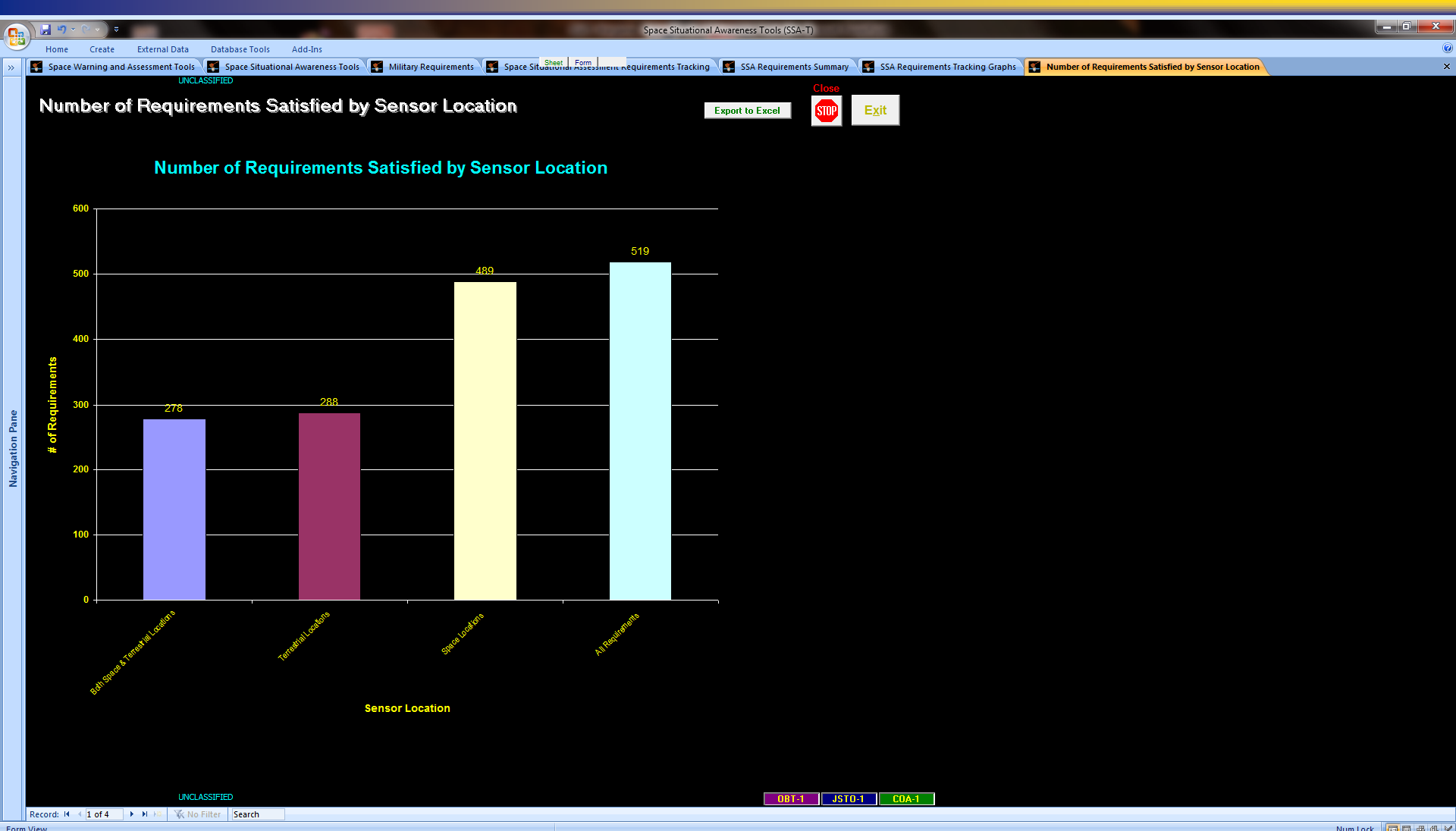
Record: 1 of 4 No Filter Search

Exit this current form

Num Lock

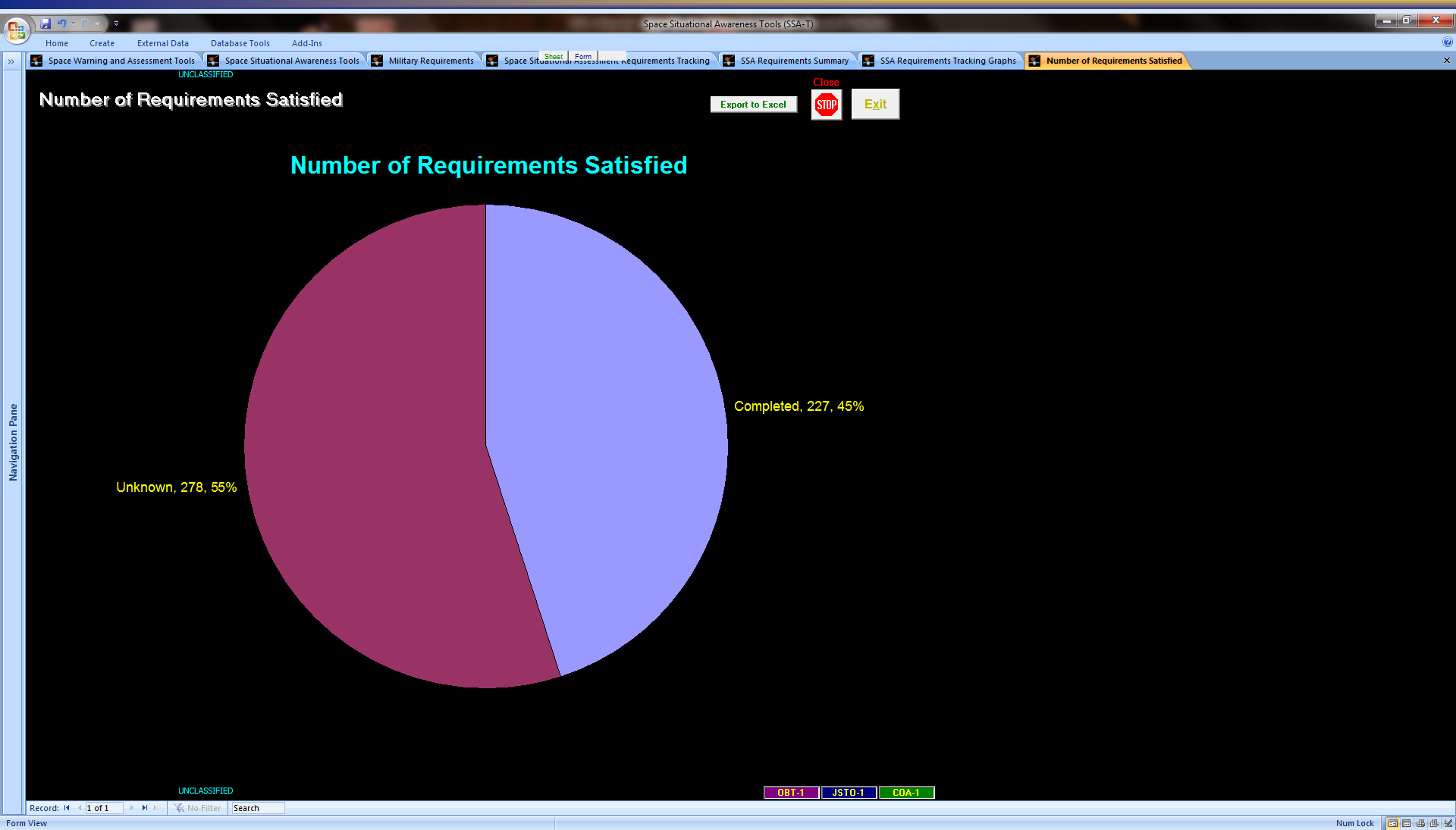
SSA Requirements Statistics Main Menu

SSA Sensor Optimization Graphs (2)



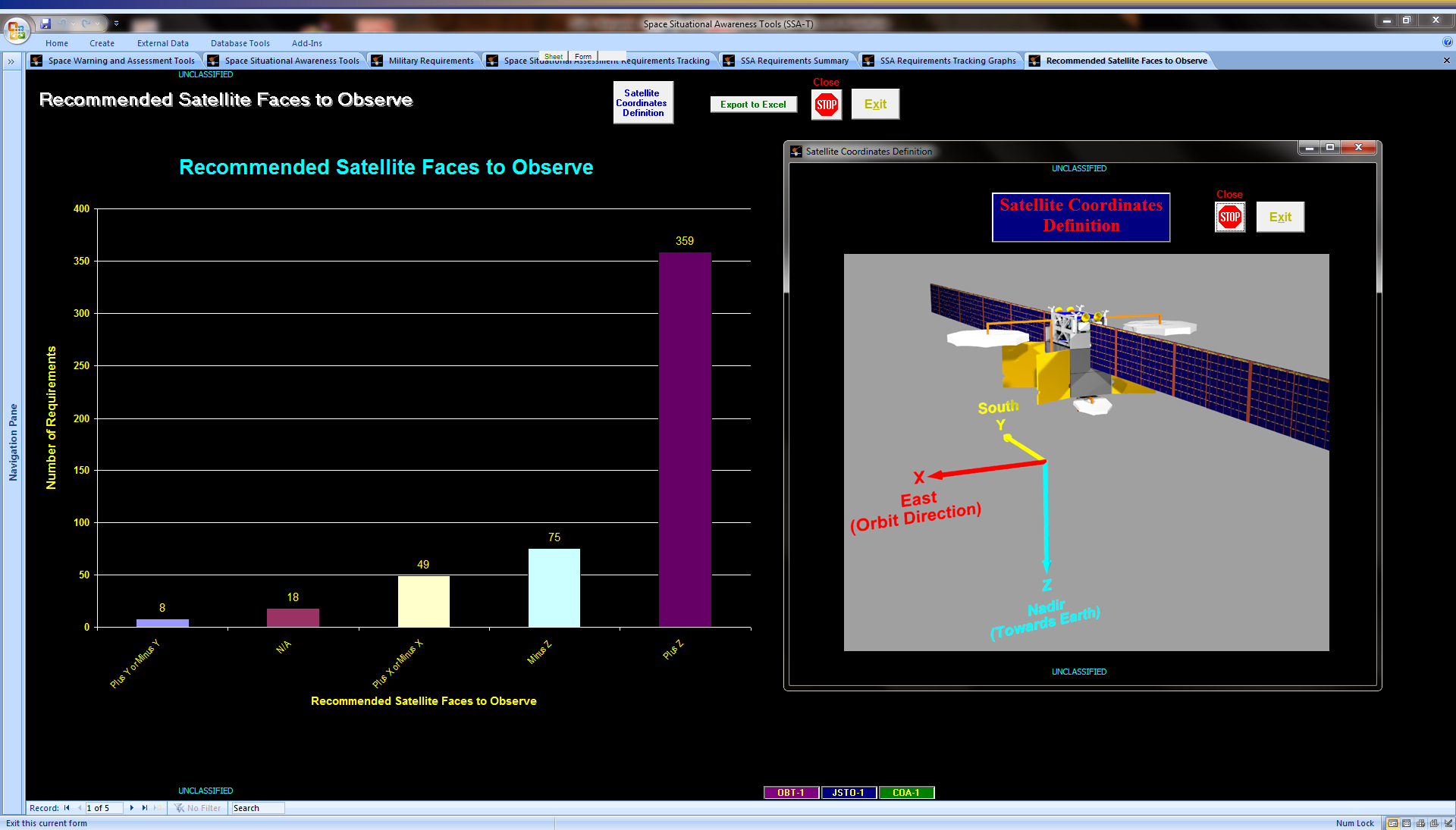
All SSA Requirements Statistics

SSA Sensor Optimization Graphs (3)



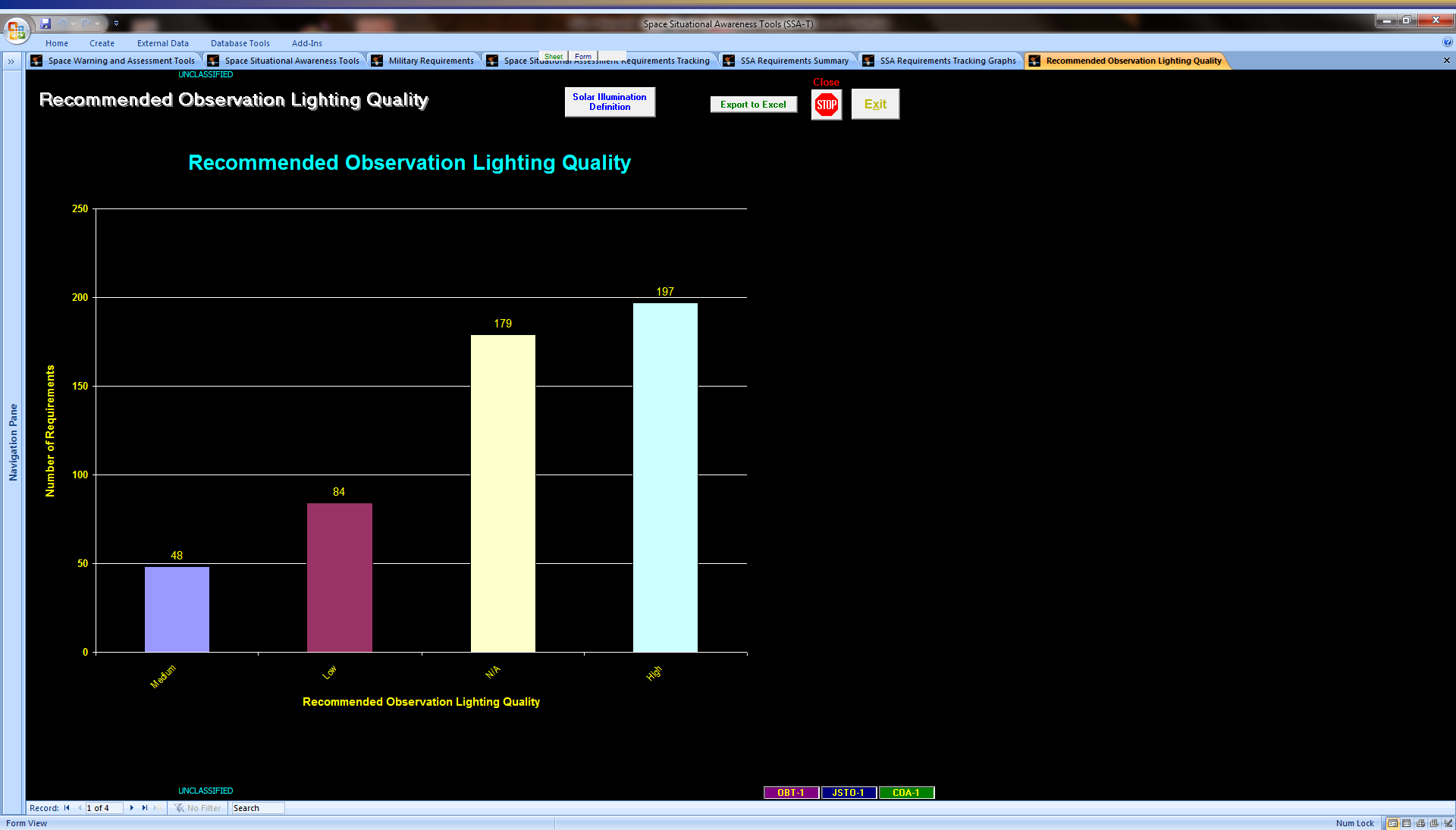
Fulfilled SSA Requirements Statistics

SSA Sensor Optimization Graphs (4)



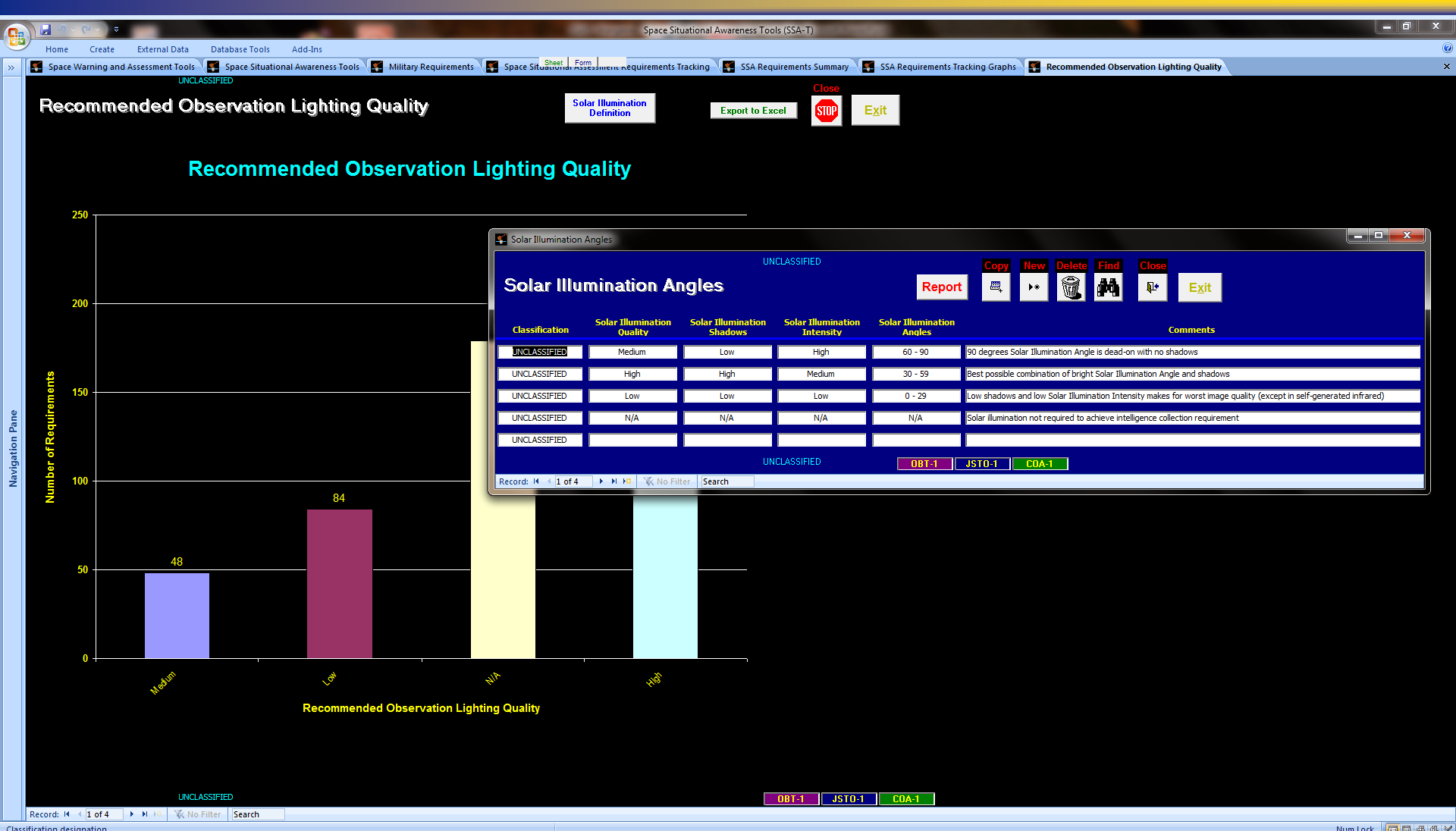
Best Side of Satellite to Observe Statistics – Suggests Best Sensor System to Employ

SSA Sensor Optimization Graphs (5a)



How Well Target Satellites Must be Sun Illuminated to Satisfy SSA Requirement

SSA Sensor Optimization Graphs (5b)



Definition of Solar Illumination Quality

SSA Sensor Optimization Graphs (6)

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements Space Situational Assessment Requirements Tracking SSA Requirements Summary SSA Requirements Tracking Graphs Required Observation Resolution

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Required Observation Resolution

NIIRS Definition Export to Excel STOP Exit

Required Observation Resolution

Space NIIRS Quality Figure	Number of Requirements
1	17
3	13
4	39
5	13
6	30
7	99
8	68
9	71
N/A	158

Space NIIRS

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Space NIIRS

Report Copy New Delete Find Close Exit

NIIRS Rating:

Resolved Distance: meters

Terrestrial Examples: Identify the wing configuration of small fighter aircraft (e.g., F-16). Detect large (e.g., greater than 10 meter diameter) environmental domes at an electronics facility.

Space Examples: Detect if large (e.g., TDRS) solar panel has deployed.

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Record: 14 of 10 No Filter Search

OB1-1 JSTO-1 COA-1

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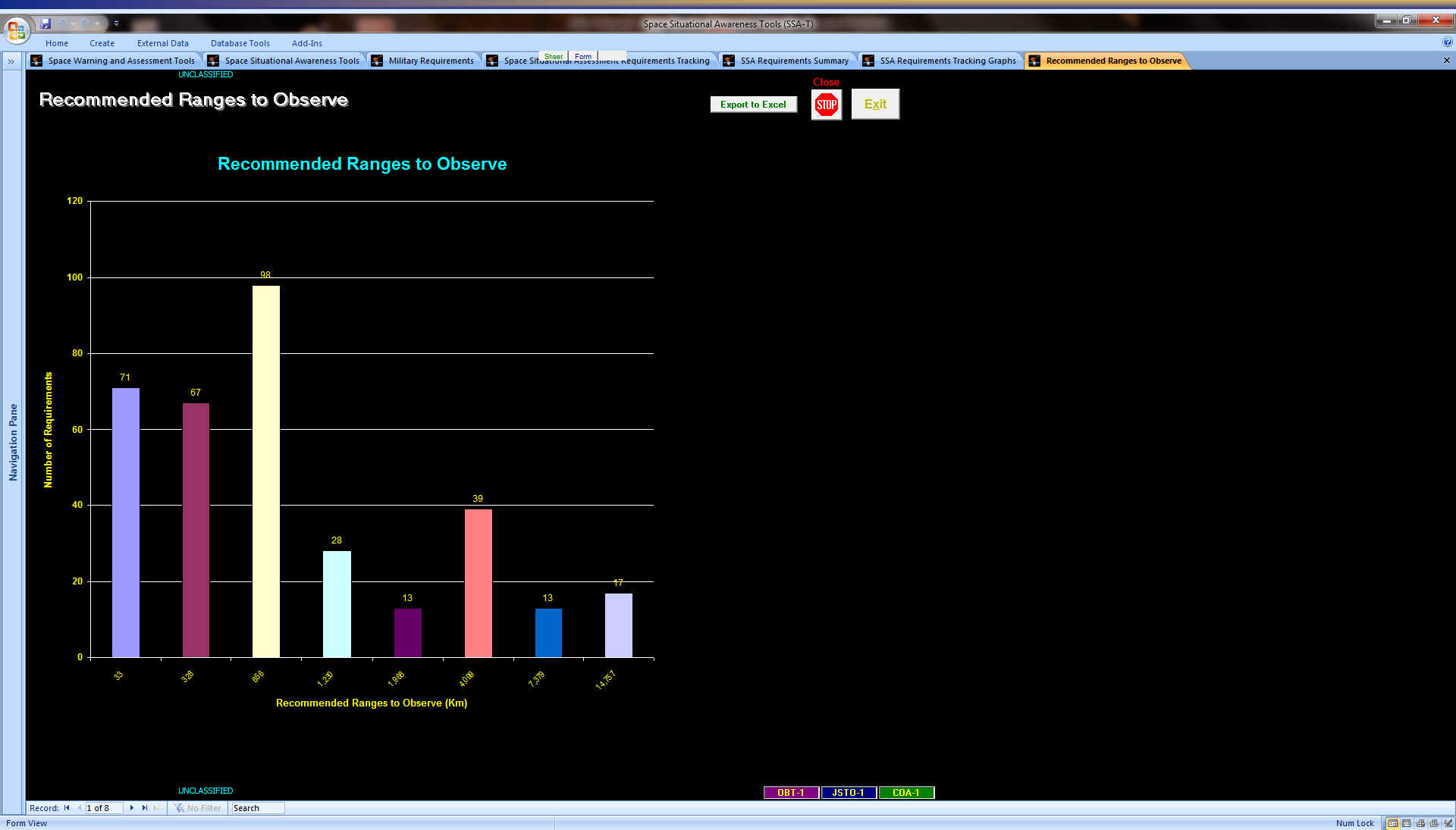
Record: 1 of 9 No Filter Search

National Imagery Interpretability Rating Scale (adapted to space)

Num Lock

What are Required Sensor / Target Image Resolutions

SSA Sensor Optimization Graphs (7)



At What Ranges Must Observations be Accomplished

SSA Sensor Collection Strategy

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements Space Situational Assessment Requirements Tracking INTEL Collection Recommendations

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INTEL Collection Recommendations

Export to Excel Report Find Close Exit

SSN #: 28924 Satellite Name: AMC-23 Operational Mission: COMM-CIVIL - Active

Total Value	Requirement #	Requirement	INTEL Collection System	Detection Means	Terrestrial	Space	Resolution	MIIRS	Lighting	Face
100.0%	3.3.1.1.1.14.1	Attitude	System-4	Imagery or RADAR	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1.2 - 2.5	4	High	Plus Z
10.0%	3.3.1.1.1.14.3.1	Appendages movement	System-4	Optical Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.20 - 0.40	7	High	Plus Z
10.0%	3.3.1.1.1.14.3.2	Appendages movement	System-4	RADAR Imagery	<input type="checkbox"/>	<input type="checkbox"/>	0.20 - 0.40	7	N/A	Plus Z
10.0%	3.3.1.1.1.16.1.5	Color of Thrusters	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.10 - 0.20	8	High	Minus Z
10.0%	3.3.1.1.1.19.1.4	Solar panel pointing direction	System-4	Imagery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.20 - 0.40	7	High	Plus X or Minus X
10.0%	3.3.1.1.1.22.1.1	Optical sensor aperture size	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	High	Plus Z
10.0%	3.3.1.1.1.22.1.2.2	Sensors : Optical : Cut-on Waveband Number	System-4	RF Signal Monitoring	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	N/A	Plus Z
10.0%	3.3.1.1.1.22.1.2.3	Sensors : Optical : Cut-off Waveband Number	System-4	RF Signal Monitoring	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	N/A	Plus Z
10.0%	3.3.1.1.1.22.1.3	Optical sensors design	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	Low	Plus Z
10.0%	3.3.1.1.1.22.1.3.1	Sensors : Optical : Detector Type	System-4	RF Signal Monitoring	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	N/A	Plus Z
10.0%	3.3.1.1.1.22.1.3.2	Sensors : Optical : Microlenslets	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	Low	Plus Z
10.0%	3.3.1.1.1.22.1.3.3	Sensors : Optical : FOV half angle	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	Low	Plus Z
10.0%	3.3.1.1.1.22.1.3.4	Sensors : Optical : IFOV	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	Low	Plus Z
10.0%	3.3.1.1.1.22.1.3.5	Sensors : Optical : Focal Length	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	Low	Plus Z
10.0%	3.3.1.1.1.22.1.3.6	Sensors : Optical : F Number	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	Low	Plus Z
10.0%	3.3.1.1.1.22.1.3.7	Sensors : Optical : Optical gain	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	Low	Plus Z
10.0%	3.3.1.1.1.22.1.3.8	Sensors : Optical : Swath width	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	Low	Plus Z
10.0%	3.3.1.1.1.22.1.3.10	Sensors : Optical : Bus obscuration limits	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.10 - 0.20	8	High	Plus Z
10.0%	3.3.1.1.1.22.1.4	Optical sensors articulating abilities	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	High	Plus Z
10.0%	3.3.1.1.1.22.1.5	Optical sensor covers and shutters	System-4	Imagery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<0.10	9	High	Plus Z
10.0%	3.3.1.1.1.22.2	Optical sensor normal pointing direction	System-4	Imagery	<input type="checkbox"/>	<input type="checkbox"/>			High	
10.0%	3.3.1.1.1.22.2.1	Sensors : RF : RF antenna size	System-4	Imagery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.20 - 0.40	7	High	Plus Z
10.0%	3.3.1.1.1.22.2.2	Sensors : RF : RF frequency bands	System-4	Imagery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.20 - 0.40	7	High	Plus Z
10.0%	3.3.1.1.1.22.2.2.1	Sensors : RF : RF frequency bands	System-4	RF Signal Monitoring	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N/A	N/A	N/A	Plus Z
10.0%	3.3.1.1.1.22.2.6.1	Sensors : RF : RF FOV	System-4	Imagery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.10 - 0.20	8	High	Plus Z
10.0%	3.3.1.1.1.22.2.6.2	Sensors : RF : RF IFOV	System-4	Imagery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.10 - 0.20	8	High	Plus Z
10.0%	3.3.1.1.1.22.3	Proximity Detectors Present	System-4		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Plus Z

UNCLASSIFIED

OB1-1 JSTO-1 COA-1

Record: 1 of 278 No Filter Search

Number denotes the overall value of fulfilling this intelligence requirement. The higher the percentage, the better.

Num Lock

Space Sensor Requirements Ranked & Optimized

Top SSA Requirements for This Conflict Phase

SSA Sensor Collection Strategy - Recommended Satellite Faces to Observe -

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Military Requirements Space Situational Assessment Requirements Tracking INTEL Collection Recommendations - Faces

UNCLASSIFIED

INTEL Collection Recommendations - Faces **Report** **Find** **Close** **Exit**

Export to Excel

Face Score	SSN #	Satellite Name	Prime Face
13.05	28924	AMC-23	Plus Z
3.9	28924	AMC-23	Minus Z
2.3	28924	AMC-23	Plus X or Minus X
0.1	28924	AMC-23	Plus Y or Minus Y

Ranked List of Which Sides of Satellites to Observe

UNCLASSIFIED

OBT-1 **JSTO-1** **COA-1**

Record: 1 of 4 No Filter Search

Number denotes how much intelligence collection on this particular space object face will satisfy all intelligence requirements

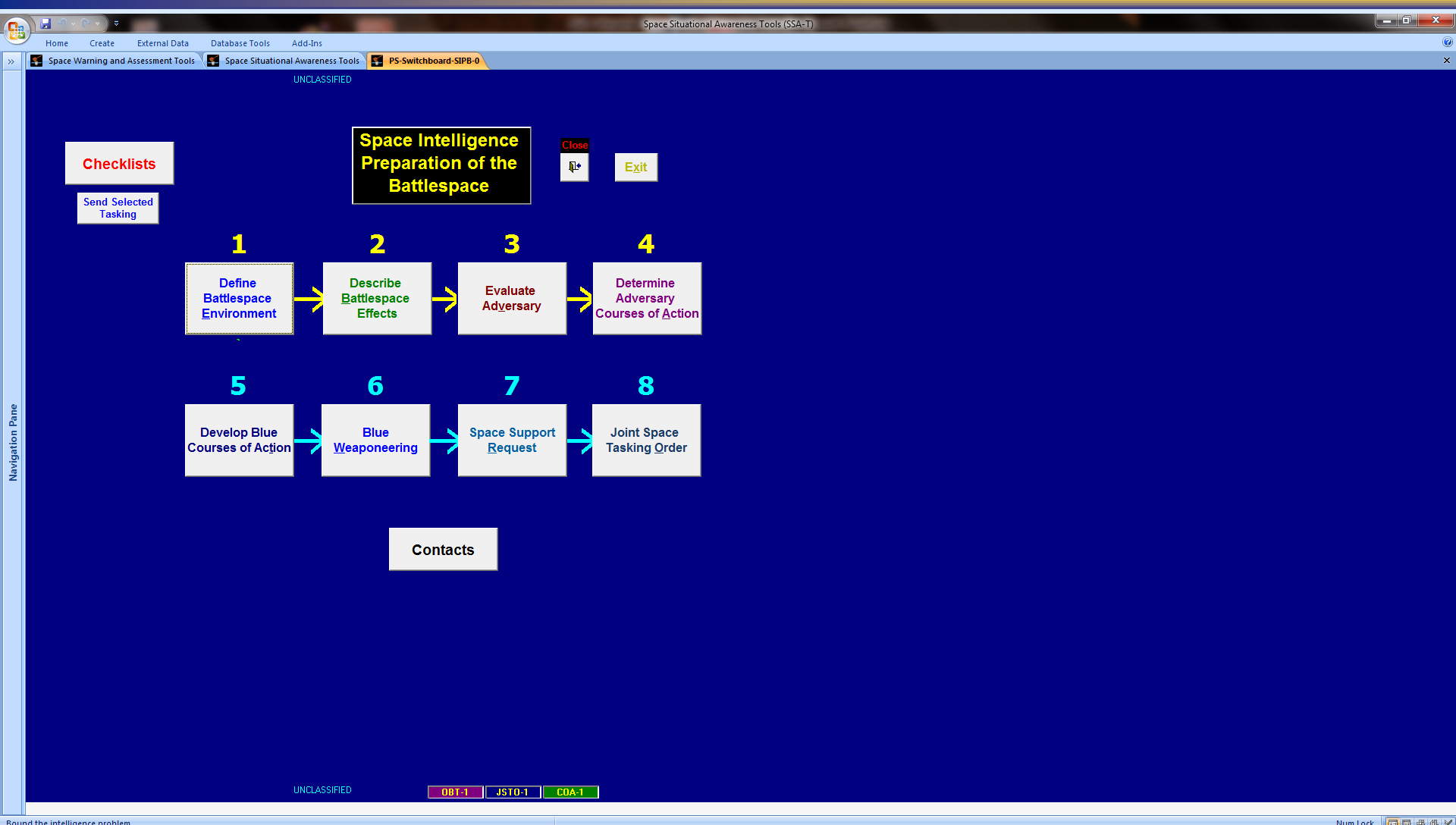
Num Lock

Prime Satellite Faces to Observe for a Particular Resident Space Object (RSO)

Space Intelligence Preparation of the Battlespace (SIPB) Tools

How to Organize Intelligence Collection Against Adversary Systems

SIPB Main Menu Screen



SIPB Top Level Organization

SIPB Options Screen (1)

The screenshot displays a software interface titled "Space Situational Awareness Tools (SSA-T)". The main window shows a workflow diagram on a dark blue background. At the top left, there is a button labeled "Import Correlation Matrix". In the center, a large black box contains the word "Checklists". To the right of this box are "Close" and "Exit" buttons. The workflow consists of five main steps: 1. "Define Battlespace Environment", 2. "Describe Battlespace Effects", 3A. "Evaluate Adversary", 3B. "Characterization Matrix", and 4. "Determine Adversary Courses of Action". Arrows indicate a sequential flow from 1 to 2, 2 to 3A, 3A to 3B, and 3B to 4. Additionally, an arrow points from step 4 back to step 3B. At the bottom of the interface, there are three small colored boxes labeled "OBT-1", "JSTO-1", and "COA-1". The text "UNCLASSIFIED" appears in two locations within the interface.

SIPB Relation to SSA Collection Requirements

SIPB Requirements Screen (1)

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools PS-Switchboard-SIPB-0 PS-Checklist-SIPB-0 1.0 Define Battlespace Environment

UNCLASSIFIED Copy New Delete Find Close

1.0 Define Battlespace Environment

Record Number: 6 Scenario Name: Baseline
Record Sequence: 6 Checklist STO Name: STO-1
Step: 1.3.1.1 Analysis Name: COA-1
Record Date: 12/20/2006 10:59:50 AM Completed Date: Completed

Level 1: Define the Battlespace Environment
Level 2: (3) Identify the limits of the Operational Area (OA).
Level 3: Geosynchronous
Level 4: Active Geosynchronous Fixed
Level 5: Mean Motion ≥ 0.8 (42,646 km) and ≤ 1.2 (31,037 km) and Eccentricity ≤ 0.04 and Inclination ≤ 1.0 Degrees
Level 6:
Level 7:
Level 8:
Level 9:
Level 10:

Desired End Effect:
Broad INTEL Requirement:
Detailed INTEL Requirements:
INTEL Derived From:
INTEL Indicators:
Resolution Requirements:
Space NIIRS:
Detection Means:
Technologies:
Comments:

UNCLASSIFIED OBT-1 JSTO-1 COA-1

Record: 6 of 50 No Filter Search

An auto incrementing unique number

Num Lock

SIPB Step 1

SIPB Requirements Screen (2)

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools PS-Switchboard-SIPB-0 PS-Checklist-SIPB-0 2.0 Describe Battlespace Effects

UNCLASSIFIED Copy New Delete Find Close

2.0 Describe Battlespace Effects

Record Number: Scenario Name:

Record Sequence: **Checklist** STO Name:

Step: Analysis Name:

Record Date: Completed Date: Completed

Level 1: Describe the Battlespace Effects

Level 2: (1) Operationally significant physical characteristics of or locations in the battlespace.

Level 3: Space Characteristics

Level 4: Frequency of good lighting conditions for optical sensors (Solar Phase Angle)

Level 5:

Level 6:

Level 7:

Level 8:

Level 9:

Level 10:

Desired End Effect: Optimize target sensing conditions

Broad INTEL Requirement: Solar Phase Angle statistics for each orbital belt (Space Defense Area)

Detailed INTEL Requirements:

INTEL Derived From: Orbital calculations

INTEL Indicators:

Resolution Requirements:

Space NIIRS:

Detection Means:

Technologies:

Comments:

UNCLASSIFIED OBT-1 JSTO-1 COA-1

Record: 4 of 58 No Filter Search

An auto incrementing unique number

Num Lock

SIPB Step 2

SIPB Requirements Screen (3)

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools PS-Switchboard-SIPB-0 PS-Checklist-SIPB-0 3.0 Evaluate Adversary

UNCLASSIFIED Copy New Delete Find Close Exit

3.0 Evaluate Adversary

Record Number: 113 Scenario Name: Baseline
Record Sequence: 111 **Checklist** STO Name: STO-1
Step: 3.2.1.20-4.5 Analysis Name: COA-1
Record Date: 12/20/2006 11:12:25 AM Completed Date: Completed

Level 1: Evaluate the Adversary
Level 2: (2) Create or update threat and other models
Level 3: Doctrinal Templates
Level 4: Command and control requirements for space weapons
Level 5: Degree of Space Autonomous Operation
Level 6: Space Weapons Free
Level 7:
Level 8:
Level 9:
Level 10:
Desired End Effect:
Broad INTEL Requirement:
Detailed INTEL Requirements:
INTEL Derived From:
INTEL Indicators:
Resolution Requirements:
Space NIIRS:
Detection Means:
Technologies:
Comments: In space defense, a weapon control order imposing a status whereby weapons systems may be fired at any target in or

UNCLASSIFIED OBT-1 JSTO-1 COA-1

Record: 111 of 779 No Filter Search

An auto incrementing unique number

Num Lock

**Close to 800 Different
INTEL Requirements**

SIPB Step 3

SIPB Requirements Screen (4)

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools PS-Switchboard-SIPB-0 PS-Checklist-SIPB-0 0 Determine Adversary COA's

UNCLASSIFIED Copy New Delete Find Close

4.0 Determine Adversary COA's

UNCLASSIFIED

Record Number: 188 Scenario Name: Baseline

Record Sequence: 174 Checklist STO Name: STO-1

Step: 4.6.1.1.2.2.2 Analysis Name: COA-1

Record Date: 12/20/2006 4:26:09 PM Completed Date: Completed

Level 1: Determine Adversary Courses of Action

Level 2: (6) Identify and nominate collection requirements that monitor potential COA and key battlespace characteristics.

Level 3: Satellite Characterization Collection Requirements

Level 4: Ownership

Level 5: Satellite characteristics

Level 6: Materials used

Level 7: Thickness

Level 8:

Level 9:

Level 10:

Desired End Effect: Assure target validation

Broad INTEL Requirement: Determine what country is attacking blue side and which space systems are valid targets

Detailed INTEL Requirements:

INTEL Derived From: Detailed Space Surveillance

INTEL Indicators:

Resolution Requirements:

Space NIIRS:

Detection Means:

Technologies:

Comments:

UNCLASSIFIED

OB1-1 JSTO-1 COA-1

Record: 174 of 371 No Filter Search

An auto incrementing unique number

Num Lock

SIPB Step 4

SIPB Requirements Screen (5)

The screenshot displays a web-based application interface for 'Space Situational Awareness Tools (SSA-T)'. The main window title is '4.0 Determine Adversary COA's'. The interface includes a top navigation bar with 'Home', 'Create', 'External Data', 'Database Tools', and 'Add-Ins'. Below this is a toolbar with 'UNCLASSIFIED', 'Copy', 'New', 'Delete', 'Find', 'Close', and 'Exit' buttons. The main content area is a form with the following fields:

- Record Number: 59
- Record Sequence: 55
- Step: 4.3.1.29
- Record Date: 12/20/2006 4:26:09 PM
- Scenario Name: Baseline
- STO Name: STO-1
- Analysis Name: COA-1
- Completed Date: [Empty] Completed

The checklist consists of ten levels:

- Level 1: Determine Adversary Courses of Action
- Level 2: (3) Develop COA Based on Adversary Perception of Friendly Disposition (Reverse AIPB).
- Level 3: Possible Space Strategies.
- Level 4: Herd Blue space communications paths to those that are more easily monitored by Red SIGINT assets
- Level 5: [Empty]
- Level 6: [Empty]
- Level 7: [Empty]
- Level 8: [Empty]
- Level 9: [Empty]
- Level 10: [Empty]

Below the levels are several requirement categories, each with a text input field:

- Desired End Effect: [Empty]
- Broad INTEL Requirement: [Empty]
- Detailed INTEL Requirements: [Empty]
- INTEL Derived From: [Empty]
- INTEL Indicators: [Empty]
- Resolution Requirements: [Empty]
- Space NIIRS: [Empty]
- Detection Means: [Empty]
- Technologies: [Empty]
- Comments: Denying certain Blue Communications paths forces Blue to use other, more easily exploitable, paths.

At the bottom of the screen, there is a status bar with 'UNCLASSIFIED', 'DBT-1', 'JSTO-1', and 'COA-1' buttons. The footer shows 'Record: 1 of 55 of 371' and 'An auto incrementing unique number'.

SIPB Step 4 Additional Example

SIPB Options Screen (2)

The screenshot displays the '1.0 Define Battlespace Environment' screen within the 'Space Situational Awareness Tools (SSA-T)' application. The interface features a dark blue background with a workflow diagram consisting of six numbered steps:

- 1.0 Define Battlespace Environment** (highlighted in yellow)
- 1.1 Analyze Commander's Mission in Relation to Space**
- 1.2 Identify Detail Required and Feasible Within Time Available**
- 1.3 Identify Limits of AO, AOI, and Battlespace**
- 1.4 Determine Significant Characteristics of AO Environment**
- 1.5 Evaluate Existing Databases and Identify Gaps**
- 1.6 Collect INTEL to Support Further Space IPB Analysis**

Navigation elements include a 'Checklist' button, a 'Send Selected Tasking' button, and 'Close' and 'Exit' buttons. A 'Navigation Pane' is visible on the left side. The bottom of the screen shows 'UNCLASSIFIED' and three colored buttons: 'OBT-1' (orange), 'JSTO-1' (green), and 'COA-1' (green). A status bar at the very bottom contains the text 'Review key points that should be considered, some of which may need to be addressed in more detail' and 'Num Lock'.

SIPB Step 1 Sub-Categories (1)

SIPB Options Screen (3)

The screenshot displays a software interface for 'Space Situational Awareness Tools (SSA-T)'. The main content area has a dark blue background and contains a workflow diagram. At the top, there is a 'Checklist' button and a large yellow box labeled '1.5 Evaluate Existing Databases and ID Gaps'. To the right of this box are 'Close' and 'Exit' buttons. Below, the workflow consists of three main steps: '1.5.1 Space IPB Data, Sources, & Links Assessment', '1.5.2 Space IPB Information Source Evaluation', and '1.5.3 Space IPB POCs'. Step 1.5.1 includes sub-sections for 'Real', 'Exercise', and 'Links'. Arrows indicate a sequential flow from 1.5.1 to 1.5.2, and then to 1.5.3. The interface also shows a 'Navigation Pane' on the left and a status bar at the bottom with 'UNCLASSIFIED' and 'OBT-1 JSTO-1 COA-1' indicators.

SIPB Step 1 Sub-Categories (2)

SIPB Options Screen (4)



SIPB Step 1 Sub-Categories (3)

SIPB Intelligence Collection Requirements (1)

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools PS-Switchboard-SIPB-0 1.0 Define Database Space Environment 1.6 Collect INTEL 1.6.1 Recommended PIR's, EEI's and RFI's

UNCLASSIFIED

Messages GBOSS Report

Copy New Delete Find Close

Exit

1.6.1 Recommended PIR's / EEI's / RFI's

PIR Requirements | PIR Coverage Zones | PIR Data Formats | PIR Requesting Organization | PIR Supporting Organization | PIR Info Organization

Exercise or Operational?: EXER RII :Message Type

Record Number: 96 Side: Red Scenario Name: Operation Blue Thunder

PIR Number: 3.1.2.10 STO Name: STO-1

Record Date: 1/8/2007 3:28:53 PM Analysis Name: COA-1

Data Source: ACE 10 Exercise Completed Date: 1/20/2010 2:25:48 PM Send Sent

PIR Category: Space Target-Type: Satellite-Unmanned

PIR Type: Tactical PIR Target-Name: IIMARSAT 3-F4

PIR Name: Status - Manash Space-Based Nano GEO M SATCAT Number: 24819

Supported Objective: Maintain Space Superiority to Control Advl BE # / EXER Name: OR90F09012 OR Nano GEO Mine-Jammer

PIR Priority: Low Country: IMSO

Priority Reason: General situational awareness Mission: COMM-CIVIL - GEO - Active

INTEL Collection Type 1: IMINT - Visible Collection Start Time: 5/11/2010 8:00:00 AM

INTEL Collection Type 2: IMINT - IR Collection End Time: 5/11/2010 11:00:00 PM

INTEL Collection Type 3: IMINT - MSI Collection Duration: 13:52

INTEL Collection Type 4: SIGINT - ELINT - TELINT Collection LTIOV: 5/12/2010 8:00:00 AM

INTEL Collection Type 5: MASINT - LASINT Desired Collection Time: 5/11/2010 12:00:00 PM

Other Phase: (Fill In Below)

Readiness Phase Crisis / Deployment Phase Combat Phase Post-Conflict Phase

Collection Frequency: Monthly Every Monday Hourly Monthly

General Comments: Conduct full RPO of OR Manash Space-Based Nano GEO Mine-Jammer (BE OR90F09012) to determine probable military mission capabilities

UNCLASSIFIED

0BT-1 JST0-1 COA-1

Record: 1 of 22 No Filter Search

An auto incrementing unique number

Num Lock

Priority Intelligence Requirements (PIR) Tasking Form

SIPB Intelligence Collection Requirements (2)

The screenshot displays the '1.6.1 Recommended PIR's / EEI's / RFI's' configuration window within the Space Situational Awareness Tools (SSA-T) application. The window is titled 'UNCLASSIFIED' and features a navigation pane on the left with options like 'PIR Requirements', 'PIR Coverage Zones', and 'PIR Data Formats'. The main configuration area is divided into two sections: 'Select Orbital Range for PIR' and 'Select Ground Range for PIR'.

Select Orbital Range for PIR:

Min		Max	
Inclination	000.1427	Inclination	000.1427
RAN	054.6122	RAN	054.6122
Eccentricity	0000000	Eccentricity	0000000
Arg Perigee	223.0000	Arg Perigee	223.0000
Mean Anomaly	235.5533	Mean Anomaly	235.5533
Mean Motion	01.00271151	Mean Motion	01.00271151
Altitude	35,795 Km	Altitude	35,795 Km
Longitude	218 Deg	Longitude	218 Deg

Buttons on the right side of the orbital range section include: **Reset All**, **LEO**, **MEO**, **GEO**, **MOLY**, and **Sun-Sync**.

Select Ground Range for PIR:

Min		Max	
Latitude:	<input type="text"/>	<input type="text"/>	
Longitude:	<input type="text"/>	<input type="text"/>	

The status bar at the bottom of the window shows 'UNCLASSIFIED' and three active filters: **0BT-1**, **JST0-1**, and **COA-1**. The bottom-most status bar indicates 'Region of the Earth defined by Latitude (minimum value) that requires INTEL monitoring' and 'Num Lock'.

Required PIR Orbital (or Geographic) Coverage Zones

SIPB Intelligence Collection Requirements (3)

Space Situational Awareness Tools (SSA-T)

UNCLASSIFIED

1.6.1 Recommended PIR's / EEI's / RFI's

Messages | GBOSS | Report

Copy | New | Delete | Find | Close

Exit

PIR Requirements | PIR Coverage Zones | PIR Data Formats | PIR Requesting Organization | PIR Supporting Organization | PIR Info Organization

Imagery Type: Any | Max Classification: Collateral Secret

Imagery Orientation: All Faces | Satellite Coordinates

Imagery Resolution: 9

Overall Format: Any | Sofcopy Format Type: Any

Hardcopy Format: Any | Sofcopy Database: Local MIDB

Hardcopy Print Size: Any | Sofcopy Operating System: Windows

Sofcopy Media Format: CD

Sofcopy Host System: Any

Data Network: Any

GBOSS Setup

Record Date: 5/13/2010 8:00:00 AM | Now

Event Type: 0

Category: 0

Aspect: Whole

Location Mode: ByName

State Vector

U: 0

V: 0

W: 0

Tasking Description: Conduct full RPO of OR Manash Space-Based Nano GEO Mine-Jammer (OE OR90F09012) to determine probable military mission capabilities

UNCLASSIFIED

0BT-1 | JST0-1 | COA-1

Record: 1 of 22 | No Filter | Search

Form View | Num Lock

Required PIR Data Formats

Terrestrial Forces Categories

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools PS-Switchboard-SIPB-0 1.0 Define Battlespace Environment 1.6 Collect INTEL Forces-Defaults Unit Data

UNCLASSIFIED

Equip Copy New Find Delete Close
Person
Aircraft

Unit Data

Review Defaults

Include Unit ID: US6WWWCAXX

Operational Control: US6WWWXXX

Present Location Name: _____

Present Latitude: _____

Present Longitude: _____

Home Location Name: _____

Home Latitude: _____

Home Longitude: _____

Ship Category: _____

Ship Category Name: _____

Unit Name: CMD OP CO, CORPS SIG BN

Type: Forces

Category: Engineer

Unit Type Code: 6WWWCA

Unit Level Code: CO

Unit Type Code: AAS

Authorized Personnel: 101

Assigned Personnel: 95

Country Code: US

Data Source: GENERIC

Ship Hull Number: _____

Ship Class: _____

UNCLASSIFIED

OBT-1 JSTO-1 COA-1

Record: 1 of 247 No Filter Search

Form View Num Lock

Terrestrial Forces Unit Data Definitions

Terrestrial Forces Equipment Categories

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools PS-Switchboard-SIPB-0 1.0 Define Battlespace Environment 1.6 Collect INTEL **Equipment Data**

UNCLASSIFIED

Equipment Data

Review Defaults Append Data

Equip Copy New Find Delete Close

Person Aircraft

Quantity Required: 0

Quantity Authorized: 0

Quantity On Hand: 2

Data Source: GENERIC

Unit ID: US6WWCAXX

Equipment Code: R38403

Description: AC SATCOM RADIO SET: A

Type: COMM

Category: Radio Relay-Analog

UNCLASSIFIED

OBT-1 JSTO-1 COA-1

Record: 1 of 7378 No Filter Search

Form View Num Lock

Terrestrial Forces Equipment Data Definitions

SIPB Options Screen (5)

UNCLASSIFIED

2.0 Describe Battlespace Effects

Close Exit

2.1 Operationally Significant Characteristics of Battlespace

2.2 Weather Effects on Friendly and Adversary Operations

2.3 Human Factors Impacting Friendly and Adversary Ops

2.4 Battlespace Effects on Broad COA at Strategic/Operational Level

2.5 Battlespace Impact on Systems at Tactical Level

UNCLASSIFIED

OB1-1 JST0-1 COA-1

Navigation Pane

Provide the commander and planning staff an understanding of battlespace aspects that provide operational benefits that can be ex...

Num Lock

SIPB Step 2 Sub-Categories

SIPB Options Screen (6)



SIPB Step 3 Sub-Categories

SIPB Options Screen (7)

The screenshot displays a software interface for 'Space Situational Awareness Tools (SSA-T)'. The main window is titled '4.0 Determine Adversary Courses of Action' and contains a flowchart with the following steps:

- 4.0 Determine Adversary Courses of Action** (Main Title)
- 4.1 Explicitly Identify Assumptions**
- 4.2 ID Adversary's Likely Objectives & Desired End State** (Sub-categories: Strat, Prin War, COG)
- 4.3 Develop COA Based on Red Perception of Blue Capabilities** (Sub-categories: Strategic COA's, Tactical COA's)
- 4.4 ID Full Set of Potential COA Available to Adversary**
- 4.5 ID Targets Adversary Uses In Executing Probable COA**
- 4.6 ID Collection Requirements That Monitor Potential COA**
- 4.7 Attack Detection and Verification Analyses**
- 4.8 Adversary Current Situation**

Navigation buttons include 'Checklist', 'Close', and 'Exit'. A 'Navigation Pane' is visible on the left. At the bottom, there are status indicators for 'UNCLASSIFIED', 'OBT-1', 'JSTO-1', and 'COA-1'. A footer note states: 'It may be necessary to develop assumptions to fill the gap(s) between what is known and unknown.'

SIPB Step 4 Sub-Categories (1)

Space Support Request Worksheet

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools PS-Switchboard-SIPB-0 5.7 Blue Space Support Request

UNCLASSIFIED

5.7 Blue Space Support Request

Messages COA Situation Copy New Delete Find Close Exit

Effects Effects Coverage Zones ROE Effects Requesting Organization Effects Supporting Organization Effects Info Organization

Record Number: 1 Side: Red Scenario Name: [Dropdown]

Effect Number: E-1 STO Name: #Name?

Record Date: 5/4/2010 9:25:55 AM Analysis Name: #Name?

Data Source: ACE 10 Exercise Completion Date: #Name? Completed

Effect Category: Diplomatic Target-Type: Space-Related Ground Facility

Effect Type: Diplomatic Pressure Target-Name: Drari Salem Space Manufacturing Facility-South

Effect Name: Pressure Orgonia to cease space weapons SATCAT Number: [Dropdown]

Effect Priority: 5.00 Update BE Number: OR90F36008

Effect Priority Reason: Critical to prevent escalation to war Country: Orgonia

Effect Success Indicator: Reduced industrial production of space we Mission: Facility - Manufacturing

Effect Description: Try convincing Orgonia to stop or reduce space weapons increased production rates to prevent arms buildup in region

Supported COA: Hidden Disrupt COA Number: 4.4.15.10

COA Category: Pre-Conflict COA Priority: Very High

COA Type: OCS-Deceive COA Priority Reason: Critical to preventing strategic surprise

COA Likelihood: Medium Probability COA Purpose: Red side loses confidence in his space systems

Effect Method	Category	Effect Start Time	Effect End Time
Diplomatic Request 1	Diplomatic	5/4/2010 9:25:55 AM	5/7/2010 11:59:59 PM
Economic Pressure 1	Economic	5/8/2010	5/14/2010 11:59:59 PM
Cyber Attack 1	Covert	5/15/2010	5/18/2010 11:59:59 PM
B-2 Search & Destroy Sortie 1	Destroy-Con	5/19/2010	5/20/2010 11:59:59 PM
GBU-24/B Flight 1	Destroy-Con	5/19/2010	5/20/2010 11:59:59 PM

Readiness Phase Crisis / Deployment Phase Combat Phase Post-Conflict

Effect Frequency: Continuous Continuous Daily Monthly

Effect Category: Diplomatic Economic Destroy-Conventional Covert

General Comments: Deny Orgonia the ability to ramp up space weapons production; destroy their ability to produce new weapons during the con

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0BT-1 JSTO-1 COA-1

Record: 1 of 1 No Filter Search

An auto incrementing unique number

Num Lock

**Automatically Ranked
According to SSA Priorities**

Blue-Side External Information or Support Request Form

Additional Space Warfare Support Tools

Other Space Warfighting Tools

Space Acronym Definitions

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools **Space Acronyms** Sheet Form

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Space Acronyms

View Sources View Duplicates Delete Duplicates Copy New Find Delete Close Exit

Use	Date	Term	Definition	Source / Comments
<input type="checkbox"/>		(D)PR	Dual Precipitation Radar	Earth Observing System Data and Information System Acronym and Abbreviation List, downloaded 8-14-08; http://www-v0ims.gsfc.nasa.gov/v0ims/acronyms
<input type="checkbox"/>		(H)	Hazardous (Task Classification)	From: NASA/KSC Acronym List, downloaded 10-10-08; http://www.ksc.nasa.gov/inforcenter/acronym.htm
<input type="checkbox"/>		(S)	Safe (Task Classification)	From: NASA/KSC Acronym List, downloaded 10-10-08; http://www.ksc.nasa.gov/inforcenter/acronym.htm
<input type="checkbox"/>		1 CACS	1st Command and Control Squadron (73 SGP), Cheyenne Mountain AS CO 80914-5000	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1 LT	First Lieutenant	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1 SCS	1st Satellite Control Squadron...obsolete, now 1 SOPS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1 SLS	1st Space Launch Squadron (45 SW), Patrick AFB FL 32925	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1 SOPS	1st Space Operations Squadron (50 SW), 400 O'Malley Ave, Suite 35, Falcon AFB CO 80912-4035	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1 SPSS	1st Space Surveillance Squadron (73 SGP), Griffiss AFB (Verona Annex) NY 13441-5000	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1 SWG	1st Space Wing...obsolete, now 21 SW	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		10 MWS	10th Missile Warning Squadron...obsolete, now 10 SWS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		10 SWS	10th Space Warning Squadron (21 SW), Cavalier AS ND 58220-5001...formerly 10 MWS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1000 SOG	1000th Satellite Operations Group...obsolete, now 6 SOPS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1001 SYSS	1001st Space Systems Squadron...obsolete, now 21 SSYS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1002 CES	1002d Civil Engineering Squadron...obsolete, now 50 CES	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1002 SPS	1002d Security Police Squadron...obsolete, now 50 SPS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1002 SSG	1002d Space Support Group...obsolete, now 50 SPTG	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1002 SSYS	1002d Space Systems Squadron...obsolete, now 50 SSYS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1003 MCCS	1003d Mobile Command and Control Squadron...obsolete, now 721 MCCS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1004 SPSSQ	1004th Space Support Squadron...obsolete, now 750 SPTS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1012 ABS	1012th Air Base Squadron...obsolete, now part of 12 SWS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1013 CCTS	1013th Combat Crew Training Squadron...obsolete, now 21 CTS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1015 ABS	1015th Air Base Squadron...obsolete, now Det 1, 12 SWS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1017 TES	1017th Test and Evaluation Squadron...inactivated Oct 92	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1022 CCTS	1022d Combat Crew Training Squadron...obsolete, now 50 CTS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		12 MWG	12th Missile Warning Group...obsolete, now 12 SWS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		12 SWS	12th Space Warning Squadron (21 SW), Thule AB GL, APO NY 09023-5000...formerly 12MWG; abs	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		1-2E	First-Second Echelon	From: Dunn Idle, Comprehensive Acronym List, Schafer Corporation, July 1 2009
<input type="checkbox"/>		13 MWS	13th Missile Warning Squadron...obsolete, now 13 SWS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		13 SWS	13th Space Warning Squadron (21 SW), Clear AS AK 99704-5001...formerly 13 MWS	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>	08-Feb-11	14 AF	14th Air Force	From: Joint Space Operations Center (JSpOC) Mission System (JMS) Integration and Sustainment Statement of Work (SOW); Version 6.0; 1 February 2011
<input type="checkbox"/>		14 AF	14th Air Force, Vandenberg AFB CA	From: USSPACECOM/JEC, UPAM13-1, 30 Jun 1994, "Space Lexicon" - http://www.fas.org/spp/military/docops/usspac/pam13:1.htm
<input type="checkbox"/>		14th	Fourteenth Air Force	

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Record: 1 of 35691 Unfiltered Search

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Important to Get Future Space Warfare Definitions Correct

Space Acronym Data Sources

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools Space Acronyms M-Dictionary Sheet Form

Comments

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From: AFRL Wargames Course, Glossary of Terms, Acronyms & Jargon, 21 April 2008

From: AFRL/RIEA Memo; 19 June, 2008

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From: Joint Publication 3-60; Joint Targeting; 13 April 2007

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Record: 1 of 47 No Filter Search

Datasheet View Num Lock

Future Space Warfare Data Sources

Future Space Warfare Doctrine Definitions

Space Situational Awareness Tools (SSA-T)

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Space Warning and Assessment Tools Space Situational Awareness Tools **Space Glossary**

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Copy New Find Delete Close

Exit

Use	Date	Term	Definition	Source	Comments
<input type="checkbox"/>		Active Space Defense	Direct defensive action taken to destroy, nullify, or reduce the effectiveness of hostile space actions. It includes the use of anti-satellite weapon systems, defensive counter space weapons, electronic warfare, and other available weapons not primarily used in a space defense role. See also Space Defense.	Modified from Joint Pub 3-01.1	
<input checked="" type="checkbox"/>		Broadcast-Controlled Space Interception	An interception in which the interceptor is given a continuous broadcast of information concerning the space defense situation and effects interception without further control.	Modified from Joint Pub 3-01.1	
<input checked="" type="checkbox"/>		Close-Controlled Space Interception	An interception in which the interceptor is continuously controlled to a position from which the target is within local sensor range.	Modified from Joint Pub 3-01.1	
<input checked="" type="checkbox"/>		Counterspace	Those operations conducted with the objective of gaining and maintaining control of activities conducted in or through the space environment.	AFPAM 14-118 5 JUNE 2001	
<input checked="" type="checkbox"/>		Counterspace	Those offensive and defensive operations conducted by air, land, sea, space, special operations, and information forces with the objective of gaining and maintaining control of activities conducted in or through the space environment. (AFDD 2-2)	AFDD 2-2.1 2, August 2004	
<input checked="" type="checkbox"/>		Defensive Counterspace	Operations to preserve US/friendly ability to exploit space to its advantage via active and passive actions to protect friendly space-related capabilities from adversary attack or interference. Also called DCS.	AFDD 2-2.1 2, August 2004	
<input checked="" type="checkbox"/>		Military Space Forces	Those national, civil, and commercial space systems and associated infrastructure that establish space power and are employed by the military to achieve national security objectives. Space forces include space-based systems, ground-based systems for tracking and controlling objects in space and transiting through space, launch systems that deliver space elements, and people who operate, maintain, or support those systems. Terrestrial-based forces operate below	AFPAM 14-118 5 JUNE 2001	
<input checked="" type="checkbox"/>		Offensive Counterspace	Operations to preclude an adversary from exploiting space to their advantage. Also called OCS. (AFDD 2-2.1)	AFDD 2-2.1 2, August 2004	
<input checked="" type="checkbox"/>		Passive Space Defense	All measures, other than Active Space Defense, taken to reduce the probability of and to minimize the effects of damage to space systems caused by hostile action without the intention of taking the initiative. These measures include camouflage, deception, dispersion, and the use of protective construction and design. See also Space Defense.	Modified from Joint Pub 3-01.1	
<input checked="" type="checkbox"/>		Space	A medium like the land, sea, and air within which military activities shall be conducted to achieve US national security objectives. (JP 1-02)	AFDD 2-2.1 2, August 2004	
<input checked="" type="checkbox"/>		Space Autonomous Operation	In space defense, the mode of operation assumed by a space system after it has lost all communications with human controllers. The space system assumes full responsibility for control of weapons and engagement of hostile targets, based in accordance with on-board surveillance and weapon system control logic. This automatic state may occur on a regular basis due to orbital movements outside regions of ground coverage and control.	Modified from Joint Pub 3-01.1	
		Space Capability	1. The ability of a space asset to accomplish a mission. 2. The ability of a terrestrial-based asset to accomplish a mission	AFDD 2-2.1 2, August	

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Record: 1 of 61 Filtered Search

Checkmark this box to filter on interesting definitions

Num Lock Filtered

Important to Get Future Space Warfare Concepts Defined

Satellite Failures and Potential Fixes Database

**Enables Warfighters to Better Understand Whether Satellite
Failures are Natural, Intentional or Accidental**

Satellite Failures Database

Space Situational Awareness Tools (SSA-T)

Home Create External Data Database Tools Add-Ins

Space Warning and Assessment Tools Space Situational Awareness Tools **Satellite Failures** Sheet Form

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Satellite Failures

Summary Graph Type Graph Detect Graph Solutions Graph Copy New Delete Find Close Exit

Satellite Description

Record #: 5
 Failure Date: 1/25/2005
 Object Name: AO-40
 Event: Catastrophic failure of main battery pack

Failure Category

External Effect Internal Effect IOT Solar Flares

Altitude Control and Stabilization Telemetry and Data Handling
 Power Thermal
 Propulsion Command, Control and Timing
 Structure Payload Other

Items to Detect: Battery Status

Solutions: Attach New Power Source; Replace Batteries; Change Attitude

Comments:

Full Event Description

AO-40 (Phase 3D)
 Operator: AMSAT North America
 Launched: 16 November 2000
 Orbit: 1,021 km x 58,795 km x 8.6 degrees [highly stable elliptical orbit with low inclination (see below)]

The amateur radio satellite was to be placed in a highly elliptical "Molniya" orbit. The following events, which are usually referred to as "the December incident", did not only make this impossible but also damaged parts of the satellite's communications payload.

"Shortly after launch, AO-40 was oriented for its first burn of the 400 N motor to primarily raise the apogee and also slightly raise perigee. The pressurization valve to the fuel tanks was successfully opened although gas flow through the valve was not as high as it should have been. The first burn occurred on the following orbit and lasted slightly longer than expected. A few minutes following this burn, the closed burn valves were noted to 'pop' open in the telemetry. The pressurization valve was closed at this time and the tanks were not pressurized. The burn valves were cycled shut without incident. After considerable discussion the following day, it was decided to cycle the pressurization valve to see if it would function nominally after multiple cycles. Proper functioning of this valve was critical for subsequent burns. During this cycling (which should have been safe since the burn valves were indicated in the telemetry as closed) the spacecraft suddenly went silent.

"It was subsequently determined that a plugged valve vent on the 400 N motor had prevented proper functioning of the burn valves and had probably allowed build-up of fuel pressure in the cooling coils around the motor bell housing. These coils apparently ruptured and in the process damaged one or (less likely) both of the burn valves. During cycling of the pressurization valve the following day, one component of the fuel apparently escaped from the damaged burn valve at the motor housing and mixed with residual second fuel component in the motor, creating a localised explosion. This pressure wave seems to have vented primarily through the centre section of the spacecraft, damaging the omni antennas on the opposite end and perhaps removing part of the covering from the omni end of the spacecraft. When the spacecraft was recovered several weeks later, its increase in spin rate indicated that a considerable amount of fuel had been lost from the spacecraft. It seems likely that only one component of the fuel escaped and after it had explosively mixed with residual second component in the motor area, the remainder of this fuel component escaped without incident through the motor region."

After the December 2000 incident, the remaining fuel for the arcjet motor (ATOS) was used to insert AO-40 in a highly stable elliptical orbit with low inclination. This means that it has very long periods of visibility, at substantial ranges (up to 60,000 km), and short periods at only a few thousand kilometres.

In January 2005, the satellite's primary battery failed and the secondary battery was not sufficiently charged to take over at this. As a result, the satellite's transmissions ceased. Operators were still optimistic as as AO-40 in spring 2005 was entering into a sun angle increasingly favourable for recharging the batteries.

(Sources: AO-40 FAQ, AMSAT News Service Bulletin)

Last updated: 21 February 2005

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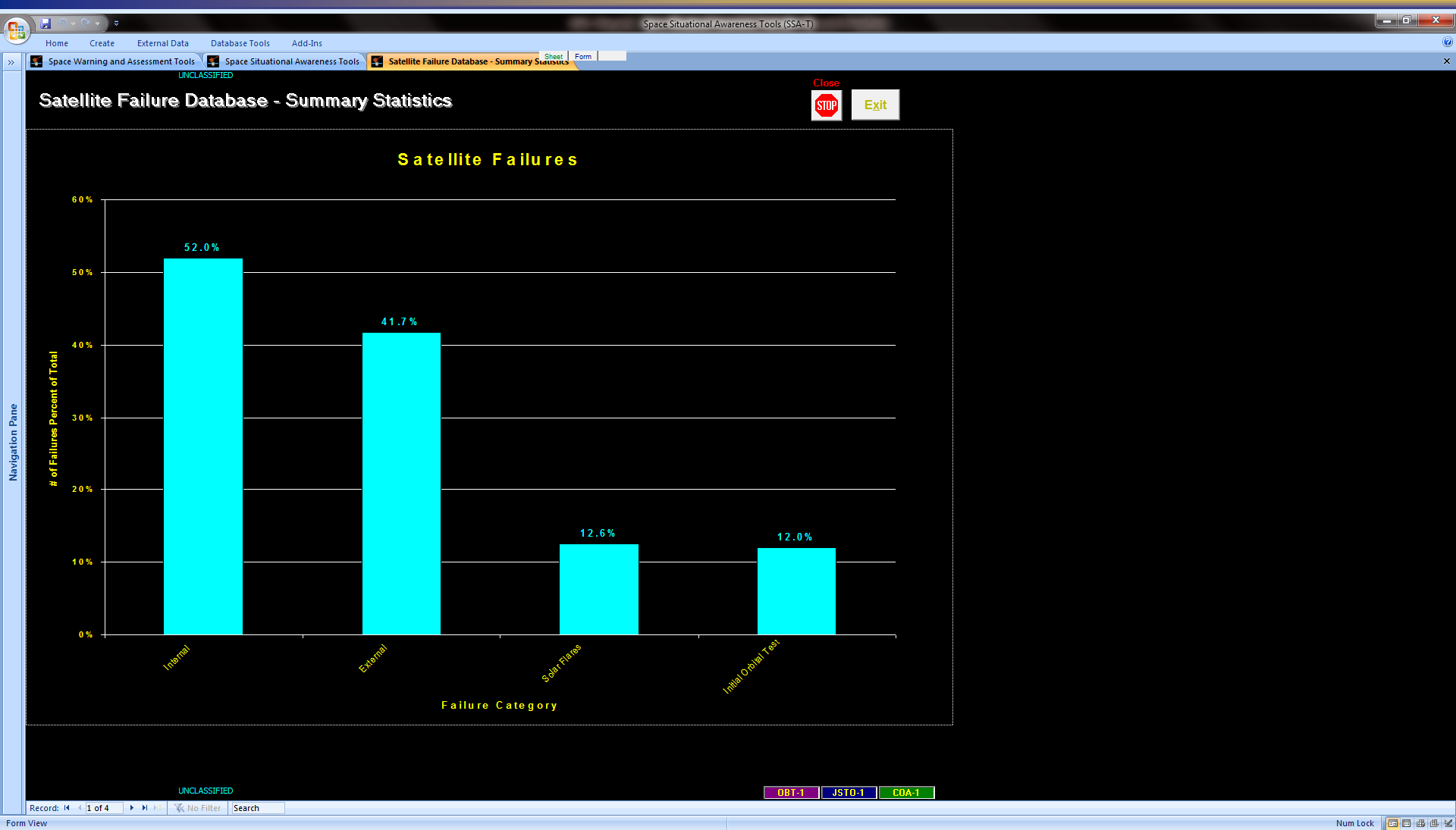
Record: 4 of 175 Unfiltered Search

This is the number of the failure database record, and is not changeable by the user

Num Lock

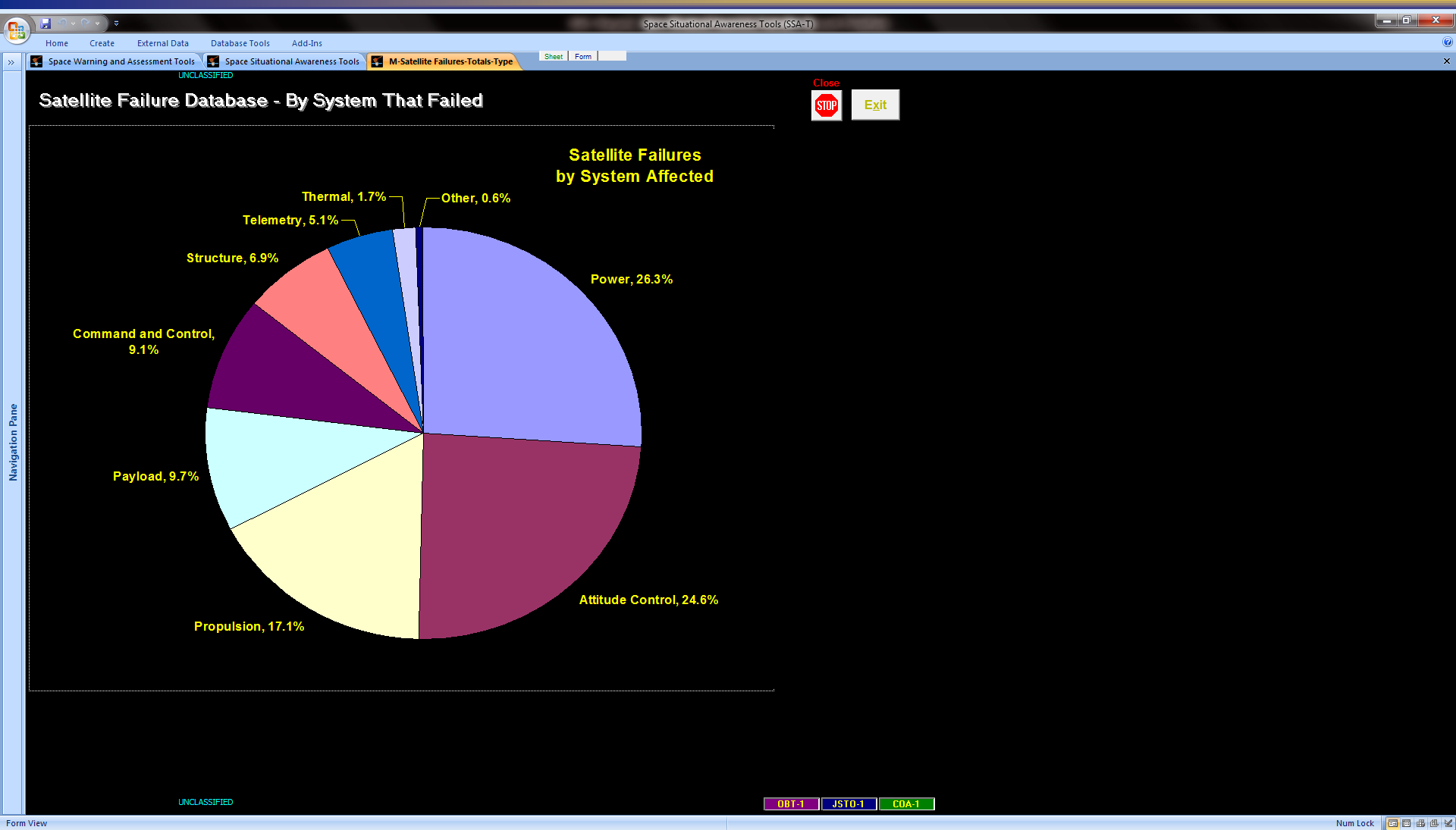
Detailed List of Commercial Satellite Failures

Satellite Failures Database Statistics (1)



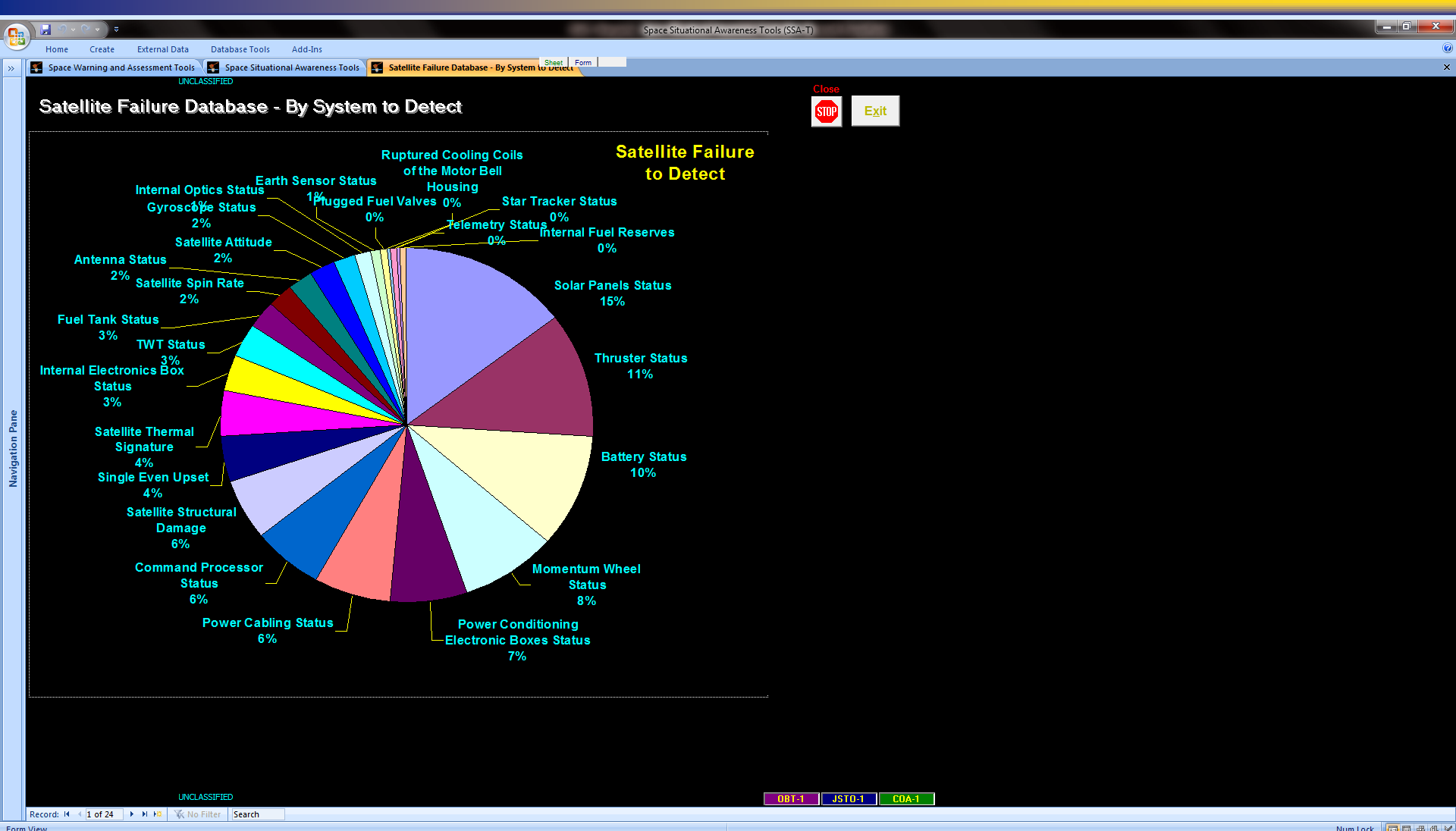
Commercial Satellite Failure Statistics by Category

Satellite Failures Database Statistics (2)



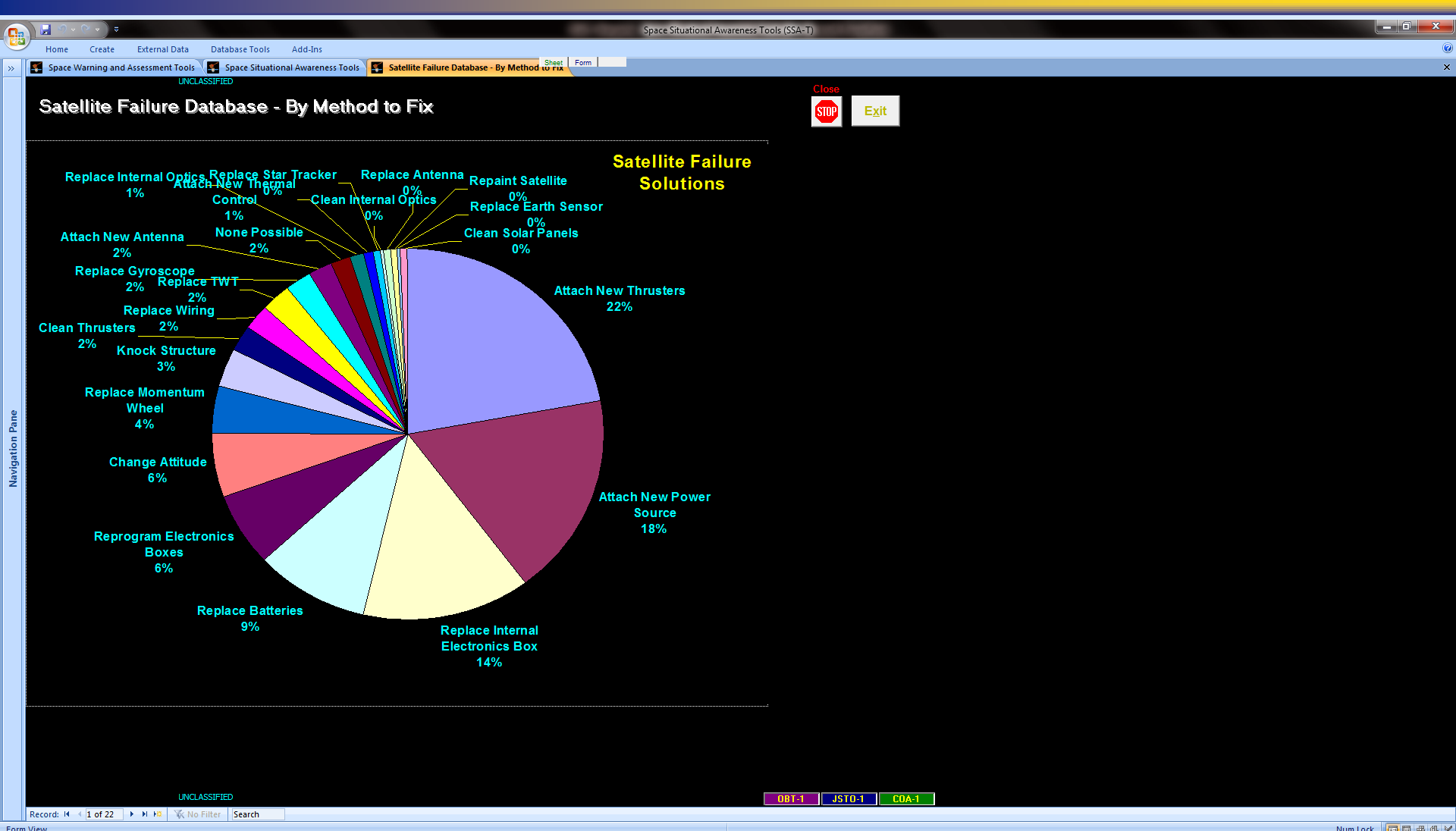
Commercial Satellite Failure Statistics by System

Satellite Failures Database Statistics (3)



Commercial Satellite Failure Statistics by System – How to Detect

Satellite Failures Database Statistics (4)



Commercial Satellite Failure Statistics by System – How to Fix

Statistics of Natural Close Approaches Between Space Objects

**Statistics on How Often do Space Objects Naturally
Approach Each Other Without Willful Intent**

Typical Satellite Encounters

Space Situational Awareness Tools (SSA-T)

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Range Altitude Copy New Find Delete Close Exit

Satellite Orbital Encounters

Record	Target	Threat	Encounter Time	Range (km)	Target Epoch	Threat Epoch	Target X	Target Y	Target Z	Threat X	Threat Y	Threat Z	Target VX	Target VY	Target VZ	Threat
1	R-Live-27422-IDEFIX	R-Live-25982-ORBCOMM FM-32	2006/02/19 18:39:30.993 UTC	0.0705	2/14/2006 4:47:34 AM	2/14/2006 1:13:54 PM	3190.8199	-4125.0007	-4929.3996	3190.8128	-4124.9347	-4929.4234	-4.27452287	3.01755849	-5.3051431	5.0080
2	U-Live-25875-GLOBALSTAR-M028	U-Dead-23001-COSMOS 2270	2006/02/27 09:36:50.310 UTC	0.1108	2/13/2006 11:24:54 PM	2/13/2006 10:24:23 PM	7498.3336	1468.059	-1535.0276	7498.4191	1468.1295	-1535.0314	-1.93370279	4.19698339	-5.46026899	1.1777
3	U-Live-25119-FM-07	U-Dead-16011-COSMOS 1680	2006/03/17 11:24:56.198 UTC	0.1273	2/14/2006 3:15:55 AM	2/14/2006 9:44:35 AM	-3352.2105	4135.1836	-4786.7502	-3352.1449	4135.2314	-4786.8482	-6.48276207	-3.26662137	1.71764199	-5.0578
4	U-Live-25396-TMSAT	U-Dead-733-Rocket Body	2006/03/04 19:38:20.268 UTC	0.131	2/14/2006 4:10:34 AM	2/13/2006 8:32:59 PM	1832.6704	-677.9304	6911.449	1832.6196	-677.9834	6911.3405	4.2399069	-5.88367245	-1.69868708	-6.9688
5	U-Live-23545-FM-01	U-Dead-26123-Debris	2006/02/25 22:33:02.529 UTC	0.1385	2/14/2006 12:41:20 PM	2/13/2006 5:26:34 PM	5326.6742	-2819.5389	-3692.7021	5326.7498	-2819.5983	-3692.6024	-1.76057595	4.34419374	-5.86910387	-4.0259
6	U-Live-25991-DMSP 5D-3-F15	U-Dead-28324-Deb-USA 073	2006/03/02 15:42:26.207 UTC	0.1544	9/28/2003 8:18:02 PM	7/18/2016 11:51:07 AM	-2809.0025	4196.4538	-5153.9555	-2809.0271	4196.3316	-5153.8644	-1.54320487	5.19981631	5.07998289	4.2104
7	U-Live-25872-GLOBALSTAR-M048	U-Dead-1549-Debris	2006/02/21 08:00:58.350 UTC	0.1644	2/13/2006 10:39:38 PM	7/19/2016 8:56:18 AM	4734.5276	-2813.9853	5501.4152	4734.586	-2814.0897	5501.5281	5.32666894	4.08059789	-2.49153344	-0.1867
8	U-Live-25770-GLOBALSTAR-M025	U-Dead-21784-COSMOS 2170	2006/02/20 11:55:48.324 UTC	0.1703	2/13/2006 6:17:07 PM	2/13/2006 7:17:27 PM	4307.8775	2106.0985	-4307.9475	6140.4678	2106.0252	-4307.9475	-3.85057014	5.29485616	-1.8879	-6.9688
9	U-Live-25528-IRIDIUM-086	U-Dead-13992-Rocket Body	2006/03/16 18:59:32.255 UTC	0.1745	2/14/2006 5:05:30 AM	2/13/2006 11:03:52 PM	503.8487	1913.9437	6869.6571	503.9422	1913.7964	6869.6581	0.13652421	7.18856182	-2.0072716	-6.9955
10	U-Live-27818-COSMOS 2398	U-Dead-13301-COSMOS 1383	2006/02/27 19:24:14.304 UTC	0.1826	2/13/2006 11:21:55 PM	2/14/2006 1:50:31 AM	2078.1229	1505.7358	-6933.9398	2078.009	1505.8762	-6933.9141	-6.73028549	-1.67362362	-2.36130303	3.6838
11	U-Live-25986-ORBCOMM FM-34	U-Dead-17117-Debris	2006/03/04 10:27:55.581 UTC	0.1845	2/14/2006 2:18:28 AM	2/14/2006 12:22:03 AM	2647.5988	4711.7214	-4711.9094	2647.7295	4711.7707	-4711.7889	-6.92996246	1.94186814	1.95564591	-1.0742
12	U-Live-25272-IRIDIUM-055	U-Dead-23286-Debris	2006/03/05 10:43:22.538 UTC	0.1866	2/14/2006 3:33:27 AM	2/14/2006 1:26:29 AM	4677.4179	2979.1643	-4553.1305	4677.495	2979.2312	-4535.2443	-4.29097103	-2.01490179	-5.75288256	3.3412
13	U-Live-25169-IRIDIUM-052	U-Dead-27677-Debris	2006/03/10 23:18:12.079 UTC	0.2097	2/14/2006 3:52:27 AM	7/18/2016 11:50:19 PM	-310.0949	5852.1051	-4119.6379	-309.9061	5852.1678	-4119.7042	-0.34634206	-4.29740063	-6.08253504	1.0483
14	U-Live-23455-NQAA 14	U-Dead-6659-METEOR 1-15	2006/03/04 10:00:11.578 UTC	0.2203	2/14/2006 11:59:01 AM	2/14/2006 6:56:03 AM	-1417.4675	4196.0915	5698.0611	-1417.6319	4196.1026	5698.2074	3.62240835	-4.76433187	4.4081944	-3.5840
15	U-Live-24872-IRIDIUM-018	G-Dead-9293-Debris	2006/03/03 09:44:11.748 UTC	0.2225	2/14/2006 7:00:02 AM	7/18/2016 5:20:07 PM	-845.4734	1937.5379	6828.5954	-845.6116	1937.3763	6828.5298	-4.2423095	5.75398943	-2.15194393	5.6919
16	U-Live-28737-SHI JIAN-7	U-Dead-12987-COSMOS 1328	2006/03/13 15:44:41.439 UTC	0.2255	2/14/2006 7:43:20 PM	2/14/2006 1:49:26 PM	3194.3122	6048.1942	1198.8998	3194.2778	6047.9762	1198.8534	0.28895491	-1.62563485	7.29470742	-0.2750
17	G-Live-26094-LOUISE	U-Dead-4048-Rocket Body	2006/03/04 18:31:23.283 UTC	0.2301	2/14/2006 5:03:53 PM	2/14/2006 11:00:02 AM	2180.6975	651.5398	-6775.2475	2180.7827	651.3661	-6775.372	6.81013579	-2.29013925	2.00037666	-5.0217
18	U-Live-28413-SHI JIAN-6A	U-Dead-13403-Rocket Body	2006/03/16 17:30:49.797 UTC	0.2395	2/14/2006 7:14:15 PM	2/13/2006 6:24:39 PM	-812.2756	1316.3224	-6803.1289	-812.3561	1316.3741	-6803.3485	0.82558497	7.38513183	1.34110755	-1.6551
19	U-Live-25489-ATEX	U-Dead-8682-Debris	2006/03/11 02:15:02.230 UTC	0.2402	7/8/2004 2:24:06 AM	2/14/2006 8:56:25 PM	138.7036	-959.2374	-7054.4919	138.5635	-959.0477	-7054.5372	3.94131857	6.29972045	-0.78728964	-7.3184
20	U-Live-24840-IRIDIUM-013	U-Dead-11587-Debris	2006/03/07 22:44:20.842 UTC	0.2474	2/14/2006 4:47:14 AM	2/14/2006 8:53:10 AM	-485.5309	1492.3771	-6989.7899	-485.7352	1492.2553	-6989.7218	0.11771516	-7.28263311	-1.56181637	-5.8479
21	U-Live-25286-IRIDIUM-063	U-Dead-9023-Rocket Body	2006/03/08 17:23:35.674 UTC	0.2491	2/14/2006 7:39:20 AM	2/14/2006 7:21:17 PM	-3859.9488	2252.7802	5580.8983	-3860.0678	2252.9293	5580.7382	4.63412126	-3.57294477	4.63845364	2.8685
22	R-Live-27421-SPOT 5	U-Dead-27840-MONITOR-E & R/B	2006/03/05 00:38:39.628 UTC	0.2576	2/14/2006 6:13:04 PM	2/14/2006 10:28:34 AM	998.0975	582.4918	7102.495	998.1141	582.387	7102.2603	5.59471563	-4.88999736	-0.38378566	1.3065
23	U-Live-20436-SPOT 2	U-Dead-28288-Debris	2006/02/22 04:49:33.643 UTC	0.2586	2/14/2006 7:53:25 PM	2/13/2006 2:55:37 AM	-4252.5266	5551.8565	1730.4788	-4252.7243	5552.205	1730.5545	2.00296159	-0.70150608	7.13138956	-2.5951
24	U-Live-25615-USA 141	U-Dead-6061-Rocket Body	2006/03/05 17:21:56.00.722 UTC	0.2643	10/4/2003 2:05:17 AM	2/13/2006 6:11:54 PM	2138.9768	2790.1303	-6225.0273	2139.1671	2790.0187	-6225.173	5.88095388	3.58560951	-6.6315	-6.9688
25	U-Live-26958-PROBA-1	U-Dead-18152-COSMOS 1862	2006/02/24 07:49:11.431 UTC	0.2668	2/14/2006 9:34:21 PM	2/14/2006 3:33:35 AM	2362.7895	-1146.355	6427.2935	2362.8146	-1146.4549	6427.5397	4.74226038	-5.31362333	-2.62579198	-4.7871
26	U-Live-25482-FM-28	U-Dead-28071-Debris	2006/03/15 21:51:23.622 UTC	0.2703	2/14/2006 5:00:26 PM	7/18/2016 4:35:01 AM	-654.0122	6288.303	-3389.668	-654.1209	6288.3743	-3389.431	-6.16485104	1.47418505	3.32208021	0.8414
27	U-Live-28254-ROCSAT 2	U-Dead-13783-Debris	2006/03/02 19:34:07.804 UTC	0.2735	2/14/2006 9:46:56 PM	2/13/2006 5:02:45 PM	394.0228	-2298.5367	-6894.0162	394.1135	-2298.4395	-6893.7772	-4.61202521	5.39489806	-2.06220218	-2.5343
28	U-Live-25736-MUBLCOM	U-Dead-10123-Debris	2006/03/08 12:47:27.008 UTC	0.2797	2/15/2006 12:03:17 AM	2/13/2006 5:26:34 PM	-891.1162	-875.8455	-7022.6466	-891.1996	-875.6316	-7022.4285	-0.6146033	7.3904069	-0.84690418	-7.2439
29	U-Live-26064-FALCONSAT 4	U-Dead-19769-COSMOS 1992	2006/02/27 12:14:29.377 UTC	0.2837	2/14/2006 8:48:49 PM	2/14/2006 7:34:47 AM	-4556.5695	1672.3518	5235.6802	-4556.5886	1672.1299	5235.5045	-4.3221302	3.65915136	-4.88168621	3.6660
30	U-Live-27940-RUBIN-4-DSI	U-Dead-18764-Debris	2006/03/15 06:47:22.886 UTC	0.2884	2/14/2006 1:27:19 PM	2/14/2006 9:19:37 PM	4456.8379	-2249.0965	-4989.9577	4456.9518	-2249.5458	-4990.1765	3.97403828	-3.68280263	5.20803857	-2.0399
31	U-Live-23710-RADARSAT 4	U-Dead-7412-Rocket Body	2006/02/17 16:11:36.579 UTC	0.2888	2/14/2006 7:22:06 PM	2/14/2006 1:01:00 PM	3788.3883	6043.5132	-763.2011	3788.5947	6043.7129	-763.2314	1.35935462	0.06447718	7.33026214	0.5237
32	R-Live-25981-ORBCOMM FM-31	U-Dead-9415-OPS 5721	2006/02/16 15:06:06.483 UTC	0.291	2/14/2006 3:26:43 AM	3/21/2004 6:51:35 PM	-1216.3933	-6992.5	-1059.7489	-1216.3397	-6992.7858	-1059.7361	5.37956362	-0.15405109	-5.15969233	-1.3470
33	R-Live-25981-ORBCOMM FM-31	U-Dead-9415-DMSP 5D-1-F01	2006/02/16 15:06:06.483 UTC	0.291	2/14/2006 3:26:43 AM	3/21/2004 6:51:35 PM	-1216.3933	-6992.5	-1059.7489	-1216.3397	-6992.7858	-1059.7361	5.37956362	-0.15405109	-5.15969233	-1.3470
34	R-Live-25981-ORBCOMM FM-31	U-Dead-9415-AMS 1	2006/02/16 15:06:06.483 UTC	0.291	2/14/2006 3:26:43 AM	3/21/2004 6:51:35 PM	-1216.3933	-6992.5	-1059.7489	-1216.3397	-6992.7858	-1059.7361	5.37956362	-0.15405109	-5.15969233	-1.3470

UNCLASSIFIED

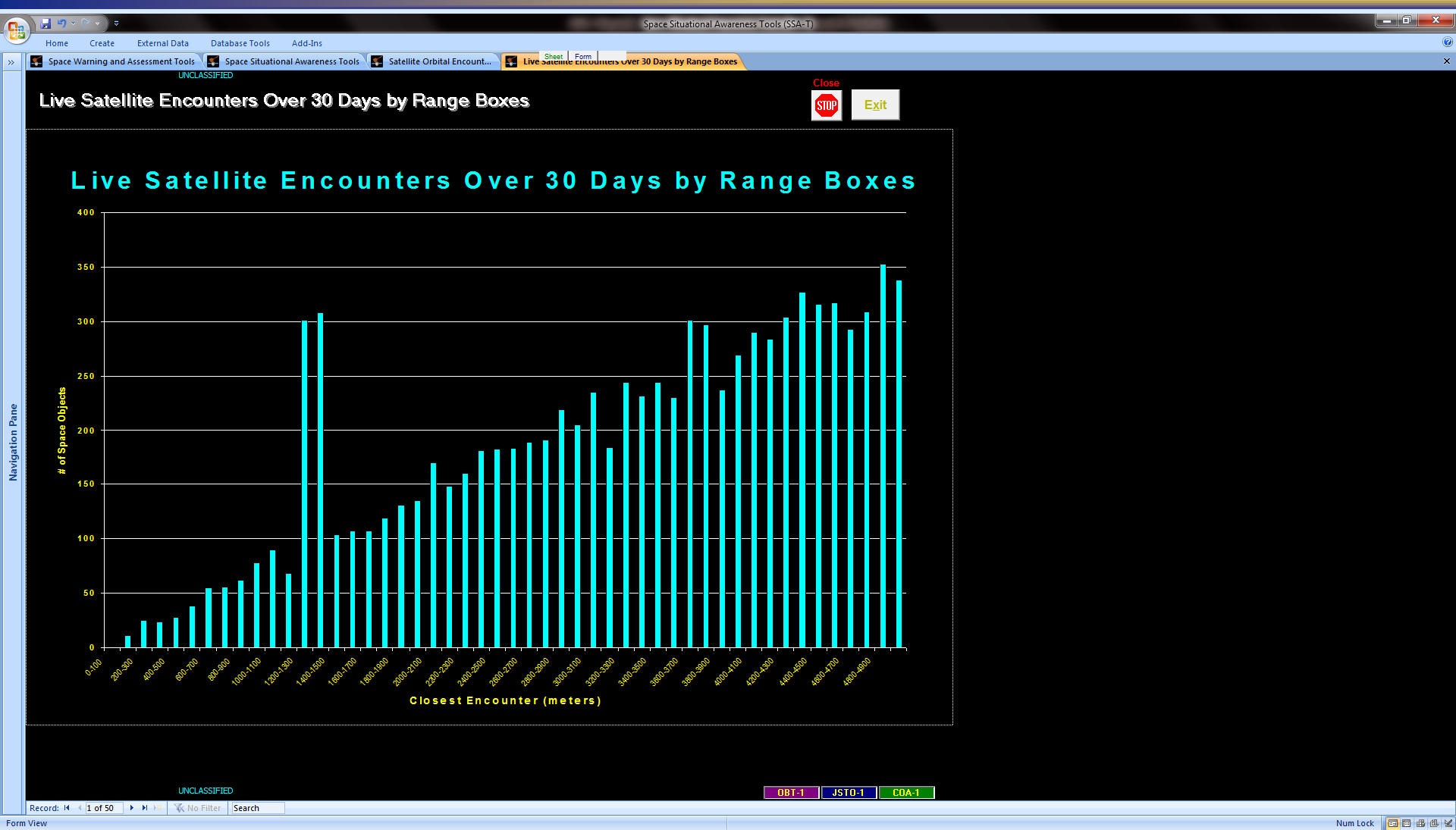
Record: 1 of 34405 | Unfiltered | Search

Graph encounter range boxes

Num Lock

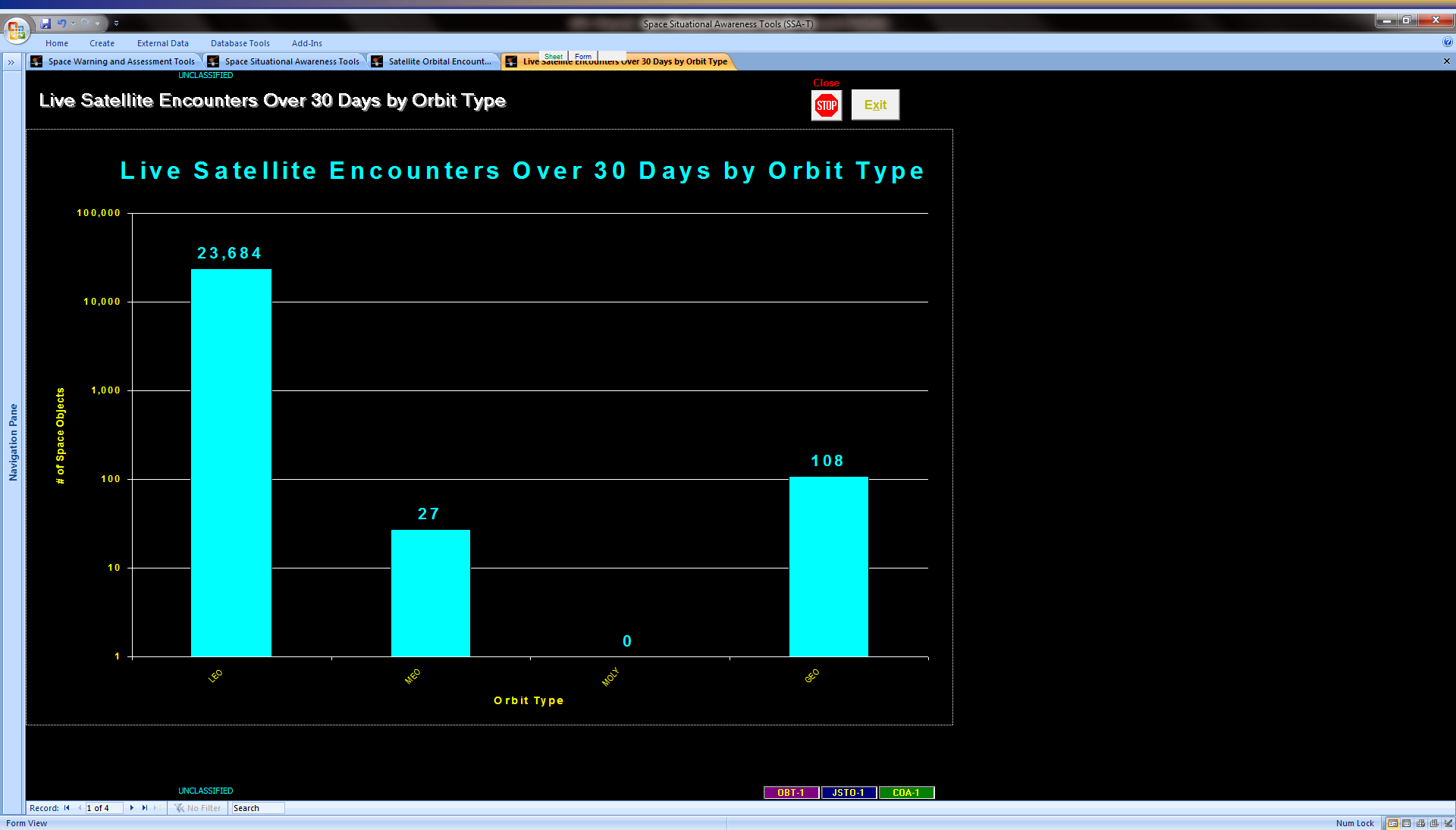
Historical Space Object Close Approach Examples

Typical Satellite Encounters Statistics (1)



Historical Space Object Close Approach Statistics by Closest Range

Typical Satellite Encounters Statistics (2)



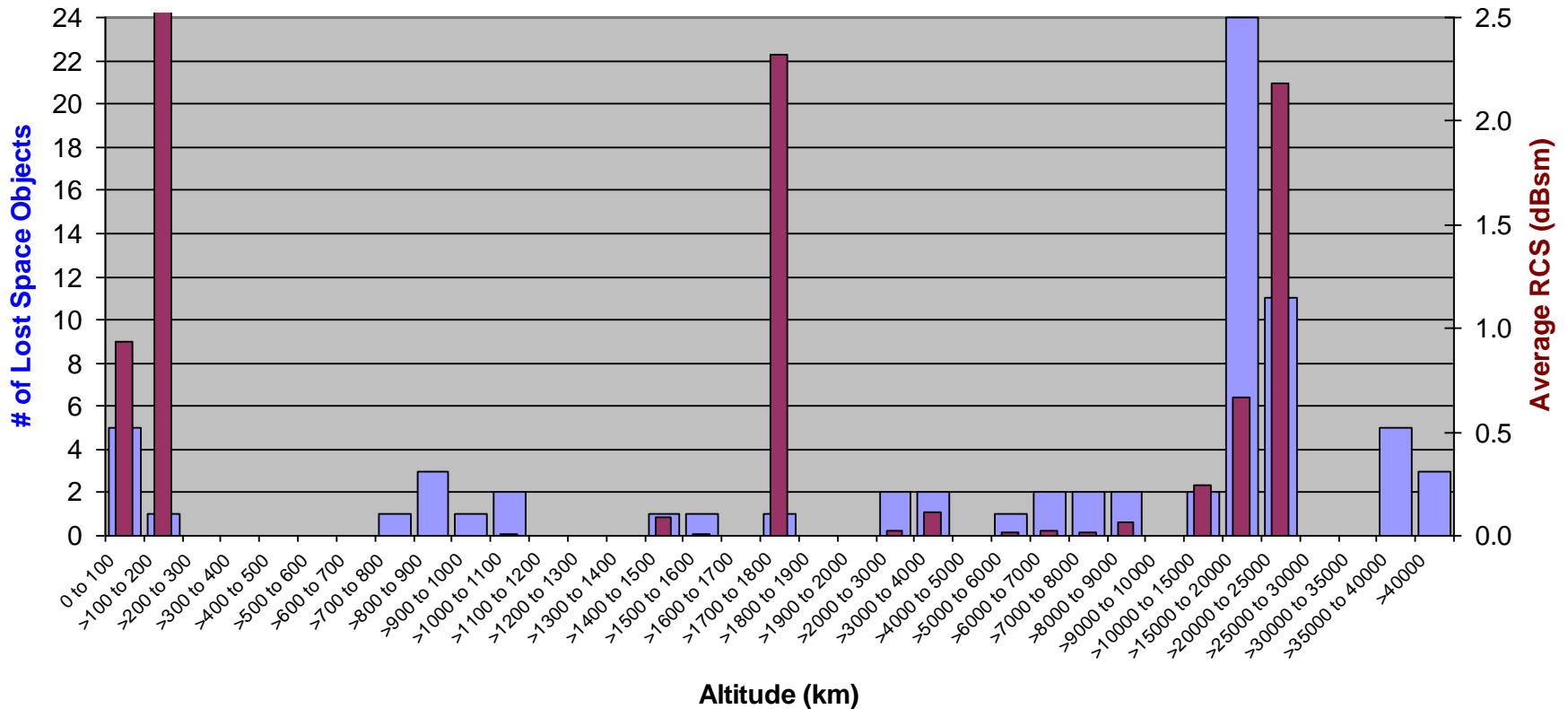
Historical Space Object Close Approach Statistics by Orbital Region

Statistics of Lost Space Objects

How Often does the JSpOC Lose Track of Space Objects

JSpOC Catalog Missing Space Objects

Number of Lost Satellites By Altitude and RCS

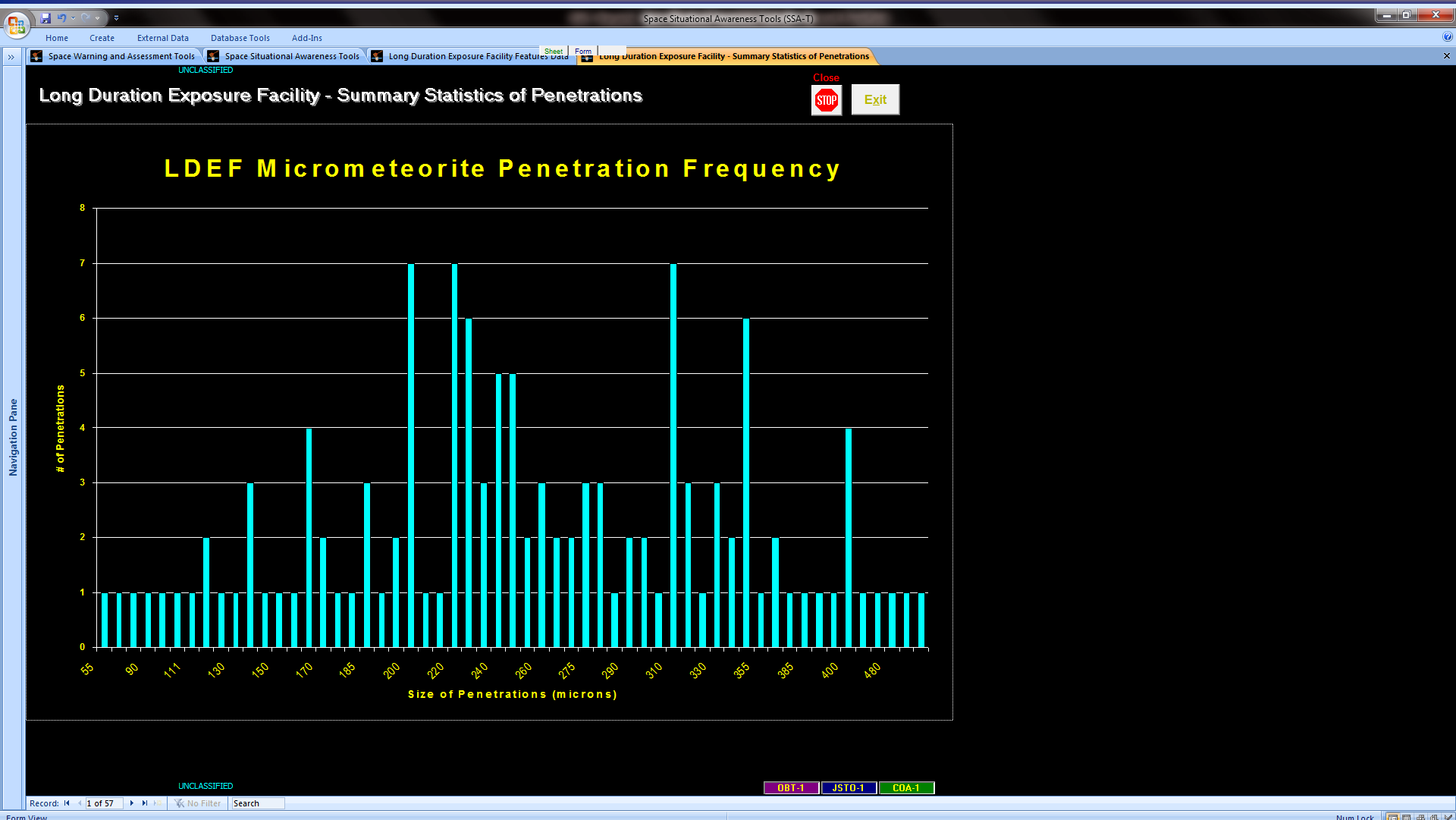


Space Object Tracks are Frequently & Easily Lost

Statistics of Natural Kinetic Penetrations on Typical Satellite Materials

Statistics on How Often Space Objects are Naturally Penetrated by Micrometeorites

LDEF Penetration Size & Frequency



Compares to Kinetic Kill Weapon Attacks

Space Object State Change Algorithms

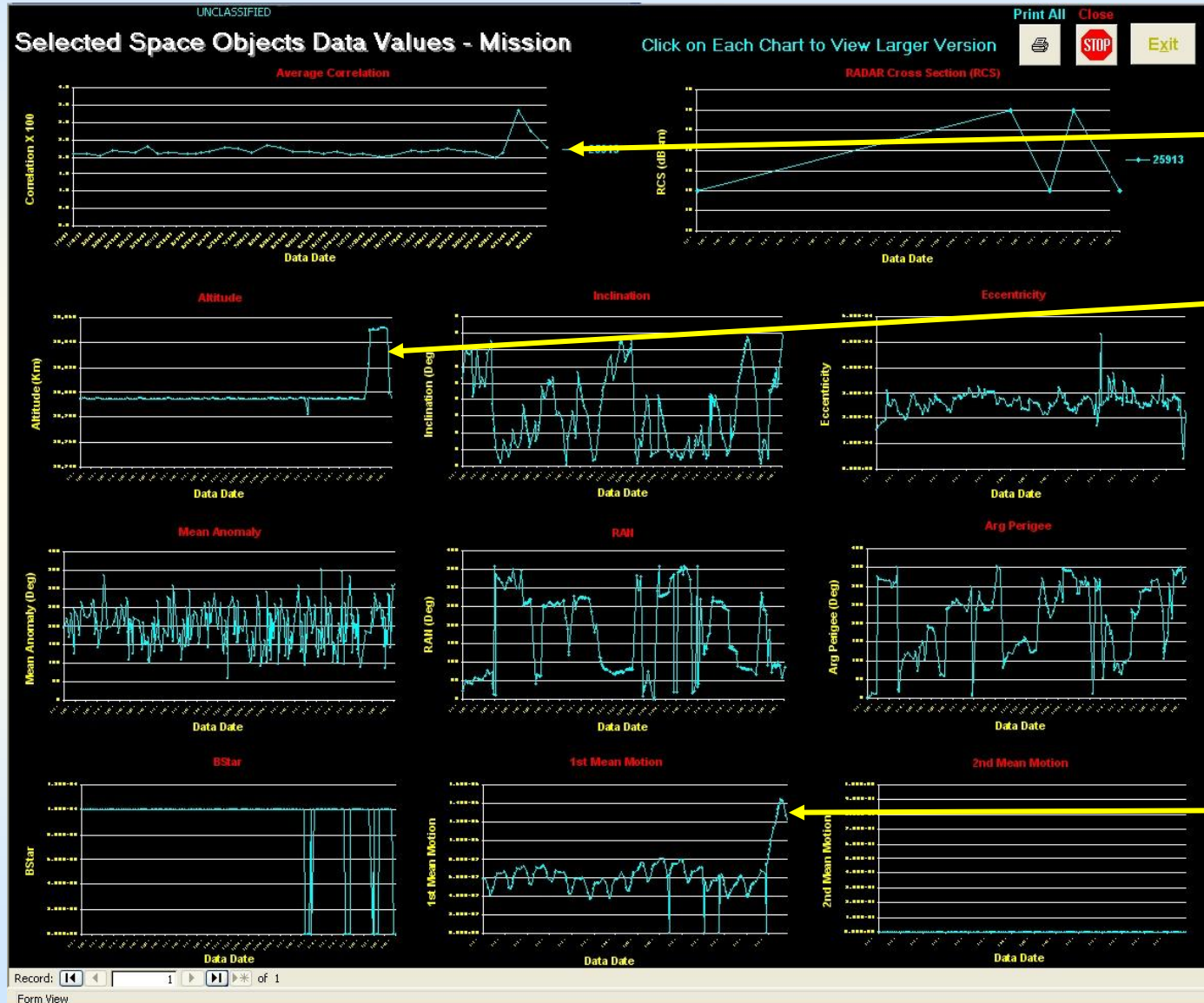
SSA-T Databases

- **Space Objects: 37,932 Records**
 - Also Includes Decayed Objects
- **Orbital Elements: 5.3 Million Records**
 - 15 Months of Data Internal to SSA-T
 - All Orbital Data Since 1957 In External Archives
- **RADAR Cross Sections: 1.5 Million Records**
 - All RCS's for All Space Objects Since 1957
- **Satellite Characteristics History: 7.5 Million Records**
 - Almost 3 Years History for All Space Objects (Live & Dead)
- **Optical Visual Magnitude & Flash Rate: 73 Thousand**
- **Space Acronyms: 35,542 Records**

Example State Changes

- **GPS (Verbal Discussion)**
- **ECHOSTAR 5**
- **MOLNIYA**
- **Beidou GEO**

ECHOSTAR 5 Maneuver

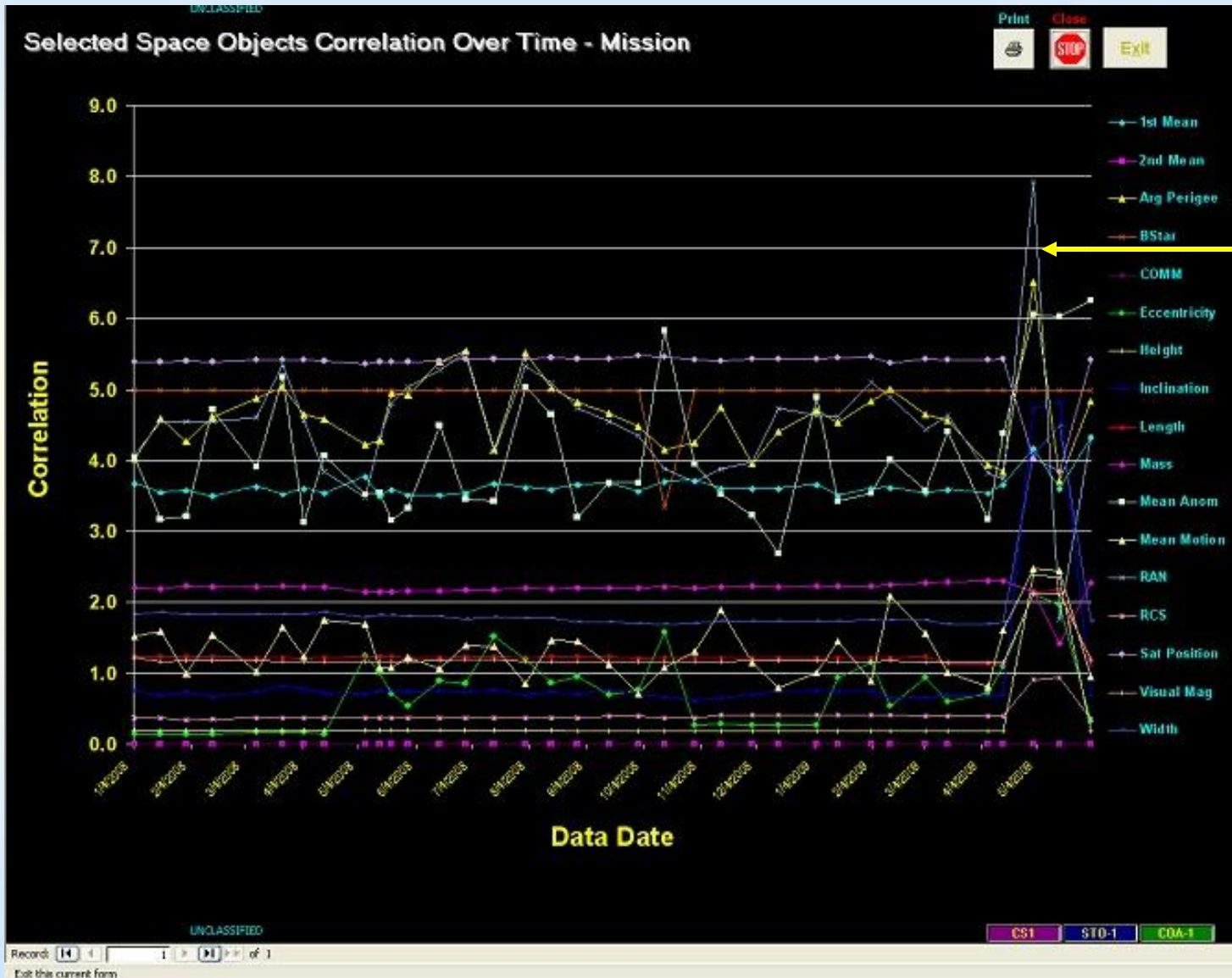


**Orbital
Maneuver
Detected In
State Change
Algorithms**

**Orbital
Maneuver
(57 km)**

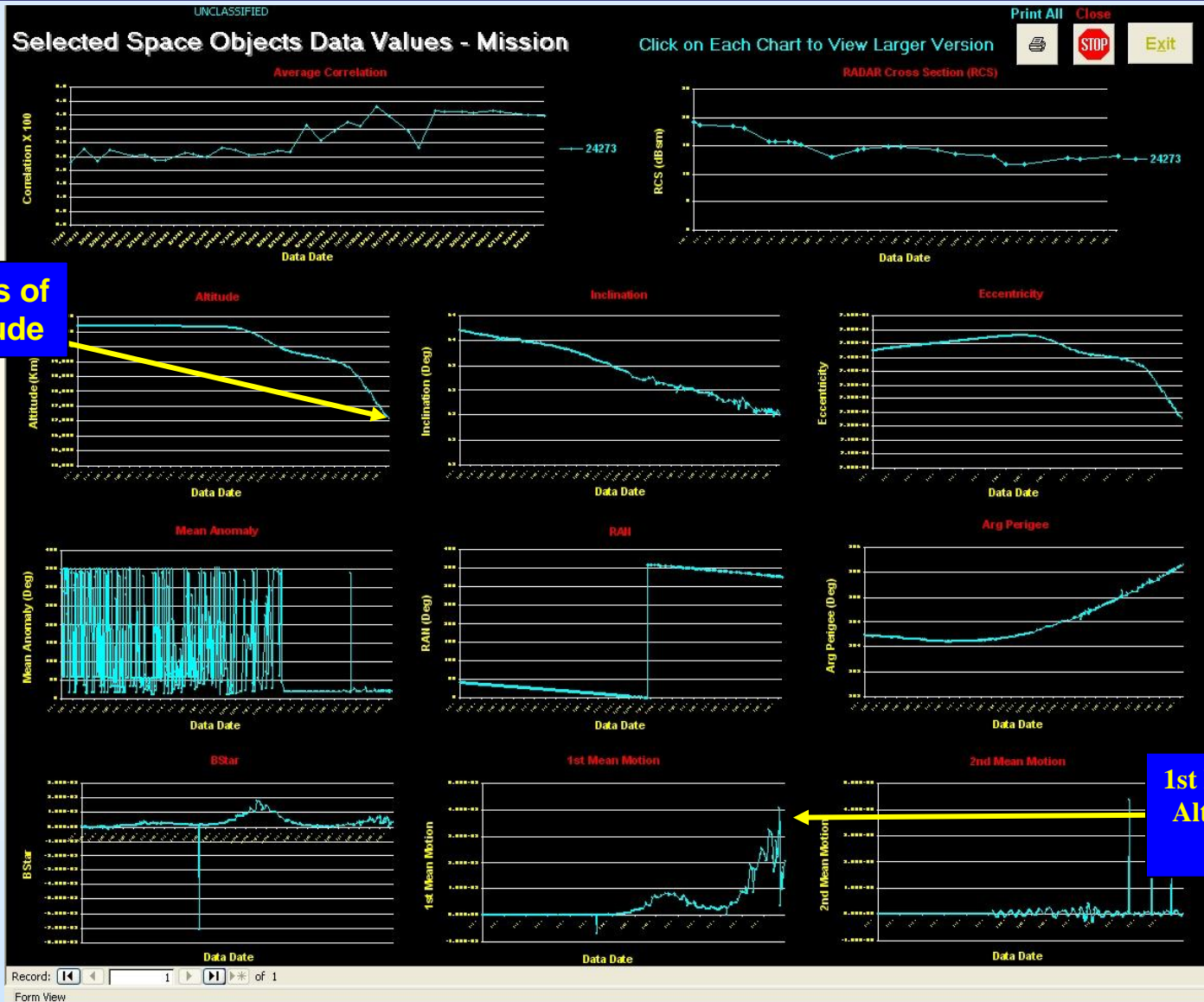
**1st Derivative
of Altitude
Rapid Change**

ECHOSTAR 5 Correlations



Orbital Maneuver Affected RAN, Arg Perigee, Mean Anomaly, Sat Position, Inclination, Eccentricity, Mean Motion, RCS, and Visual Mag Correlations Against Other GEO Satellites.

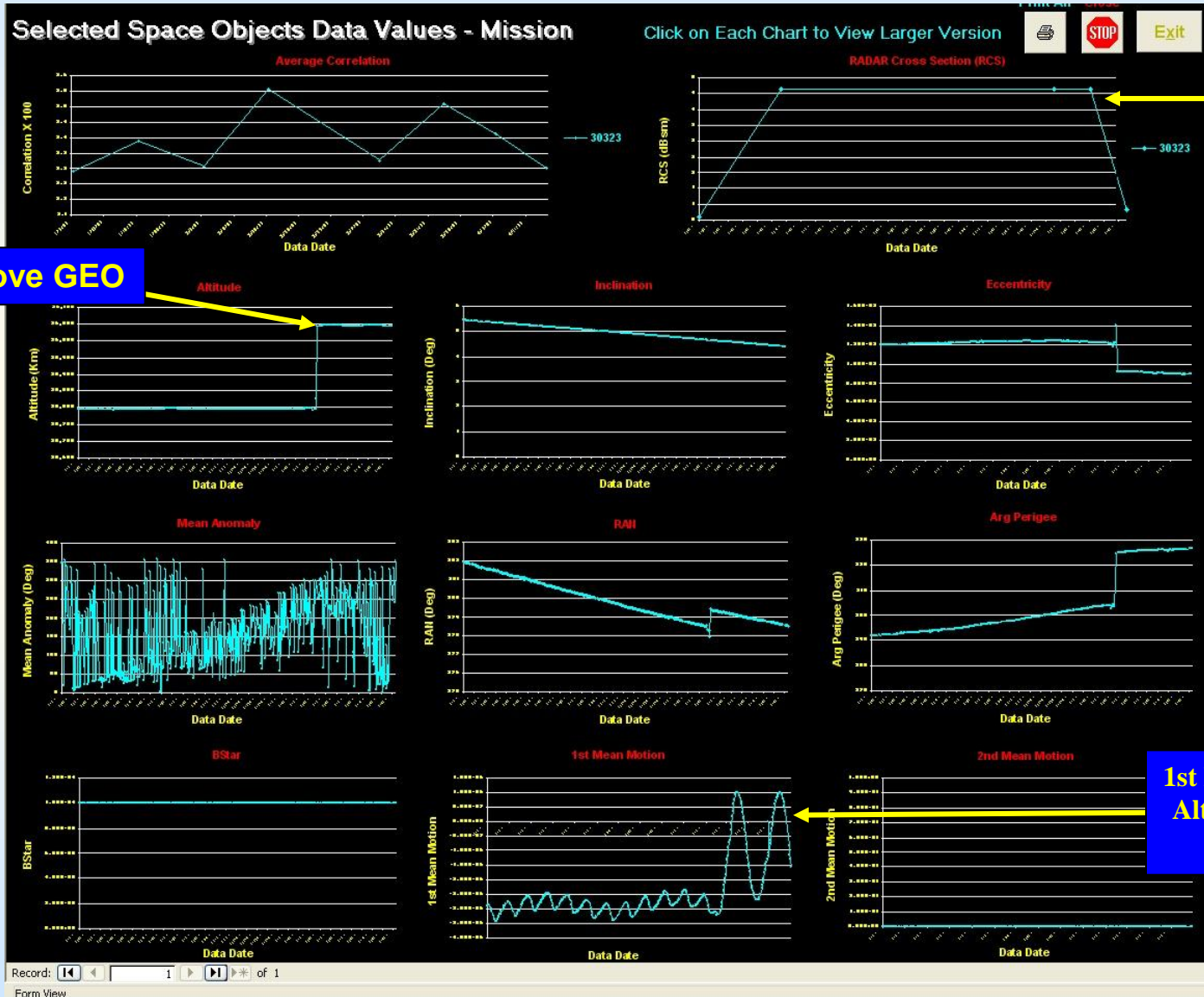
MOLNIYA Decay



3,097 Km Loss of Average Altitude

1st Derivative of Altitude Rapid Changes

Beidou - GEO Maneuver



251 Km Above GEO

RCS Changes

1st Derivative of Altitude Rapid Changes

SSA-T State Change Benefits

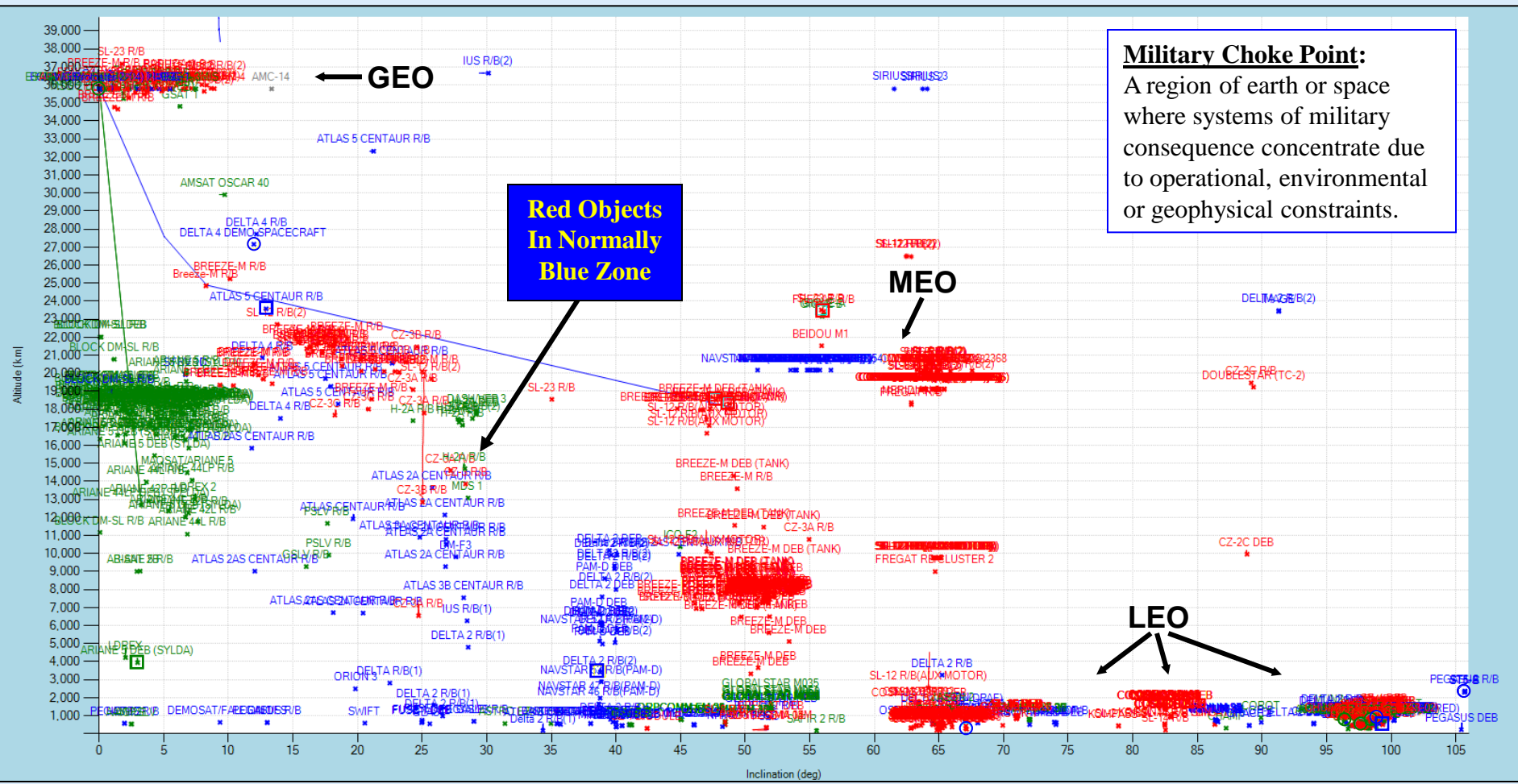
- Filters 11,496 Space Objects Down to Top 10-20 With Most Activity for More Detailed Assessment by Other Space INTEL Assets
- Possible Discovery of Hidden Adversary Intent
- May Indicate Dying or Dead Satellites Before JSpOC Assessment
- Helps Evaluate Friendly Satellite Cover Stories
- **Success** – Working Now & Ready for Operational Evaluation

SSA-T Determines If Space Systems Have Changed State – Could Signal an ASAT Attack



Satellite Attack Warning (SAW) – All Altitudes

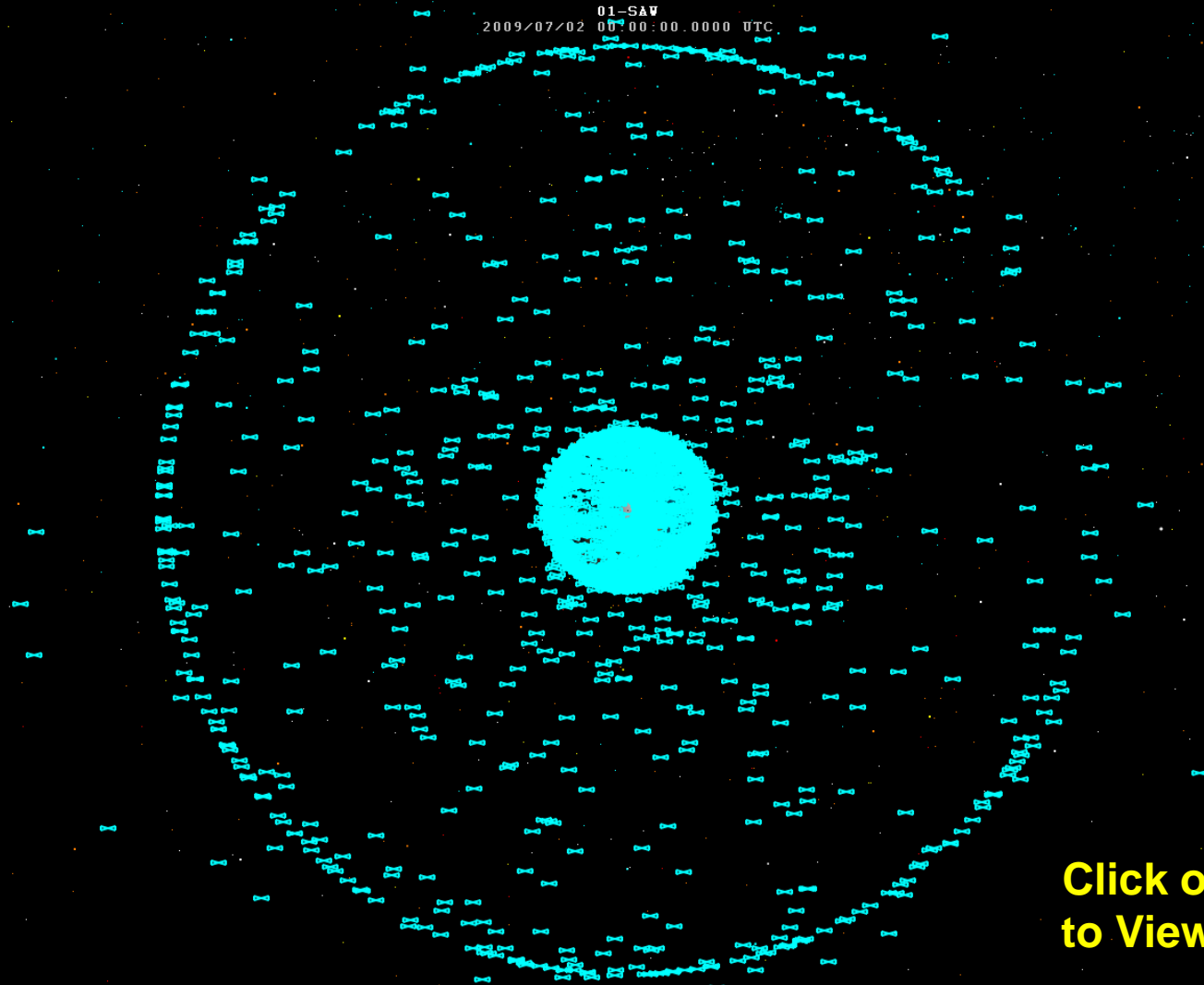
Military Choke Point:
A region of earth or space where systems of military consequence concentrate due to operational, environmental or geophysical constraints.



Space Has Choke Points As In Terrestrial Systems – They’re Just Not Stationary

Traditional Orbital View

01-5A
2009/07/02 00:00:00.0000 UTC




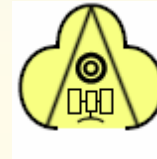

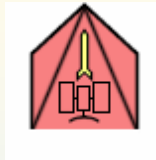








**Click on Satellites
to View Animation**

>12,000 Space Objects Confuses Users as to Possible Attack Patterns Developing

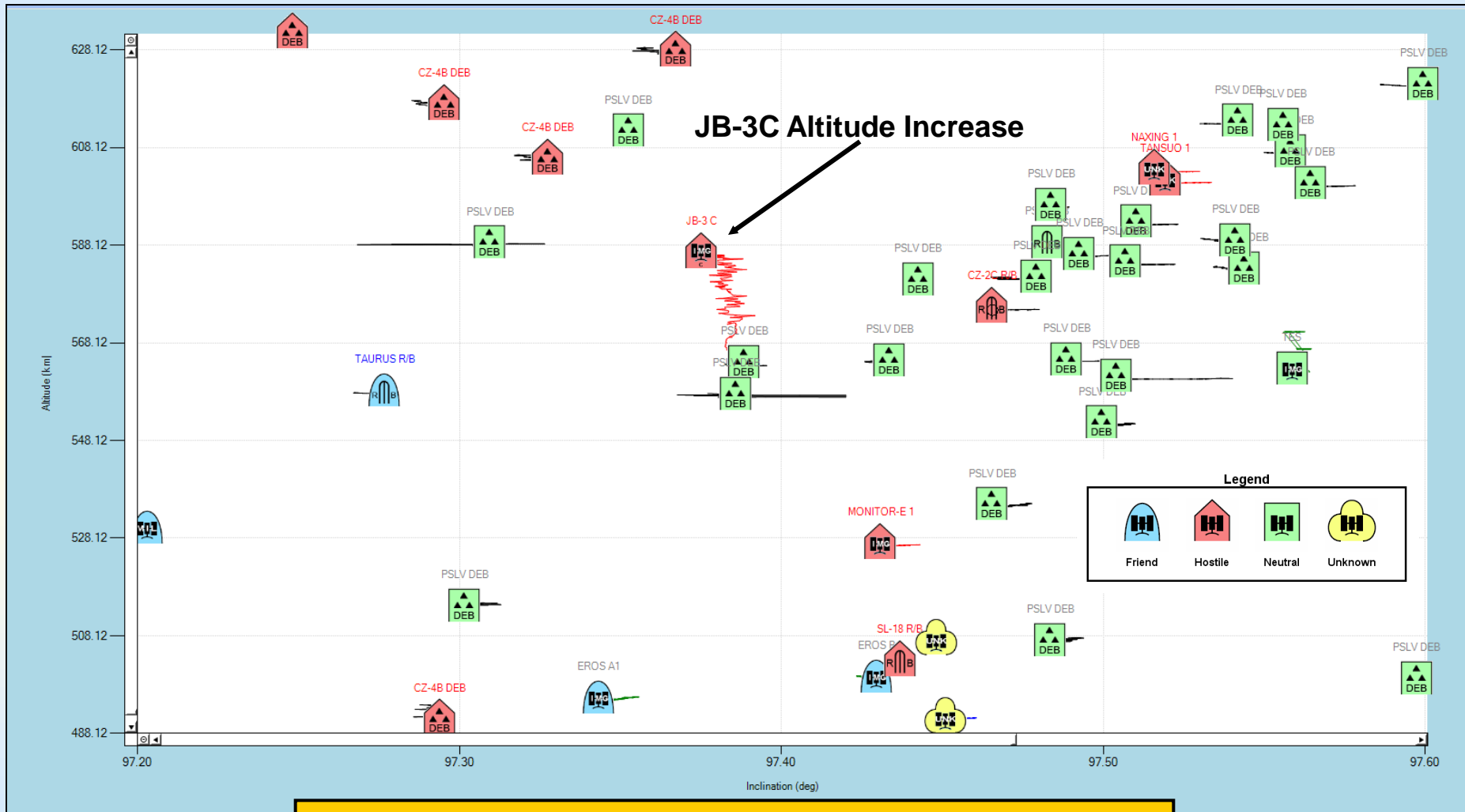
SAW – Icons

- Based on Mil-Std-2525B
- 220 New Space Icons

Friend	Adversary	Neutral	Unknown
			
			
			

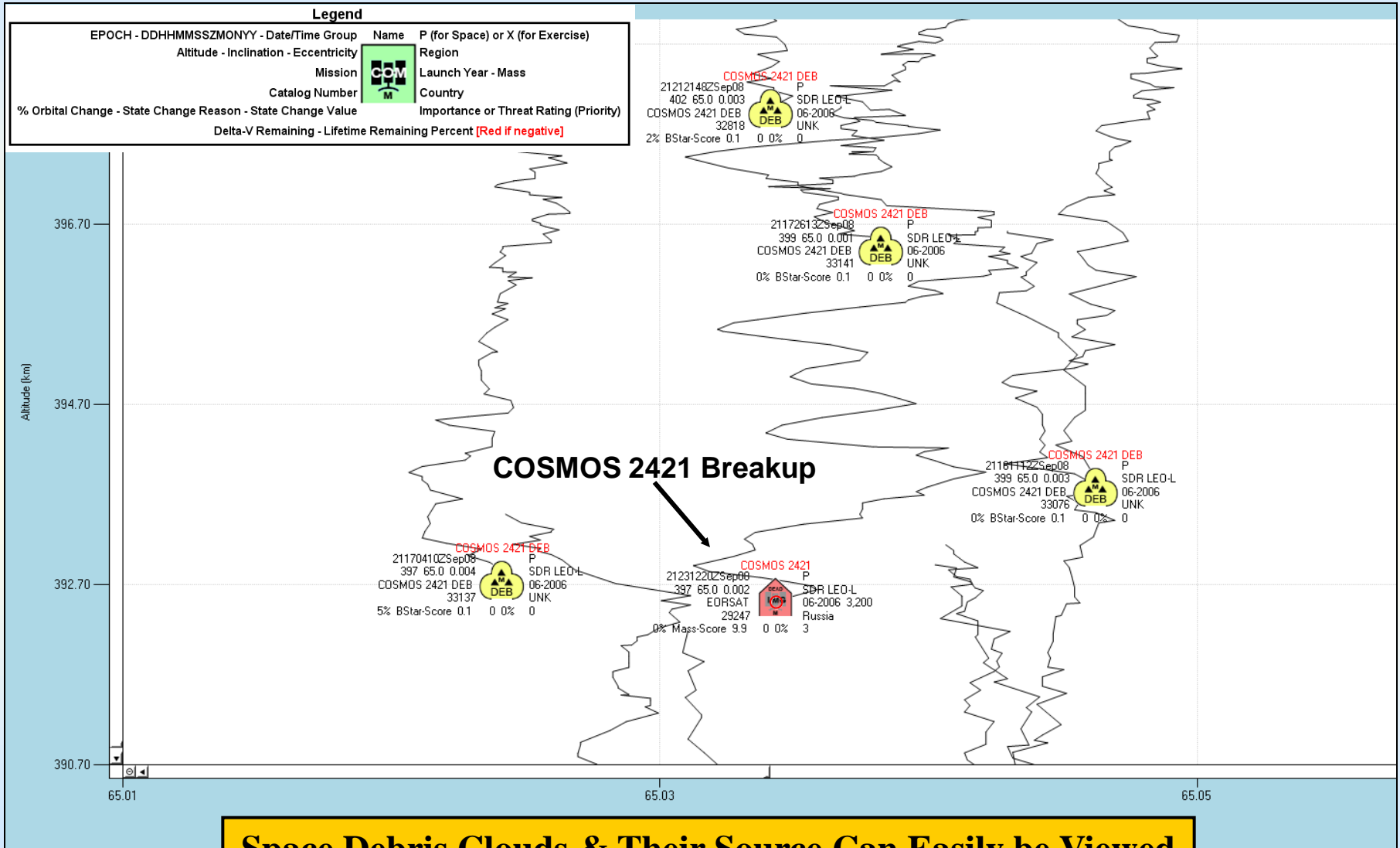
Make SAW Maps Similar to Terrestrial Situation Maps

SAW – View 1



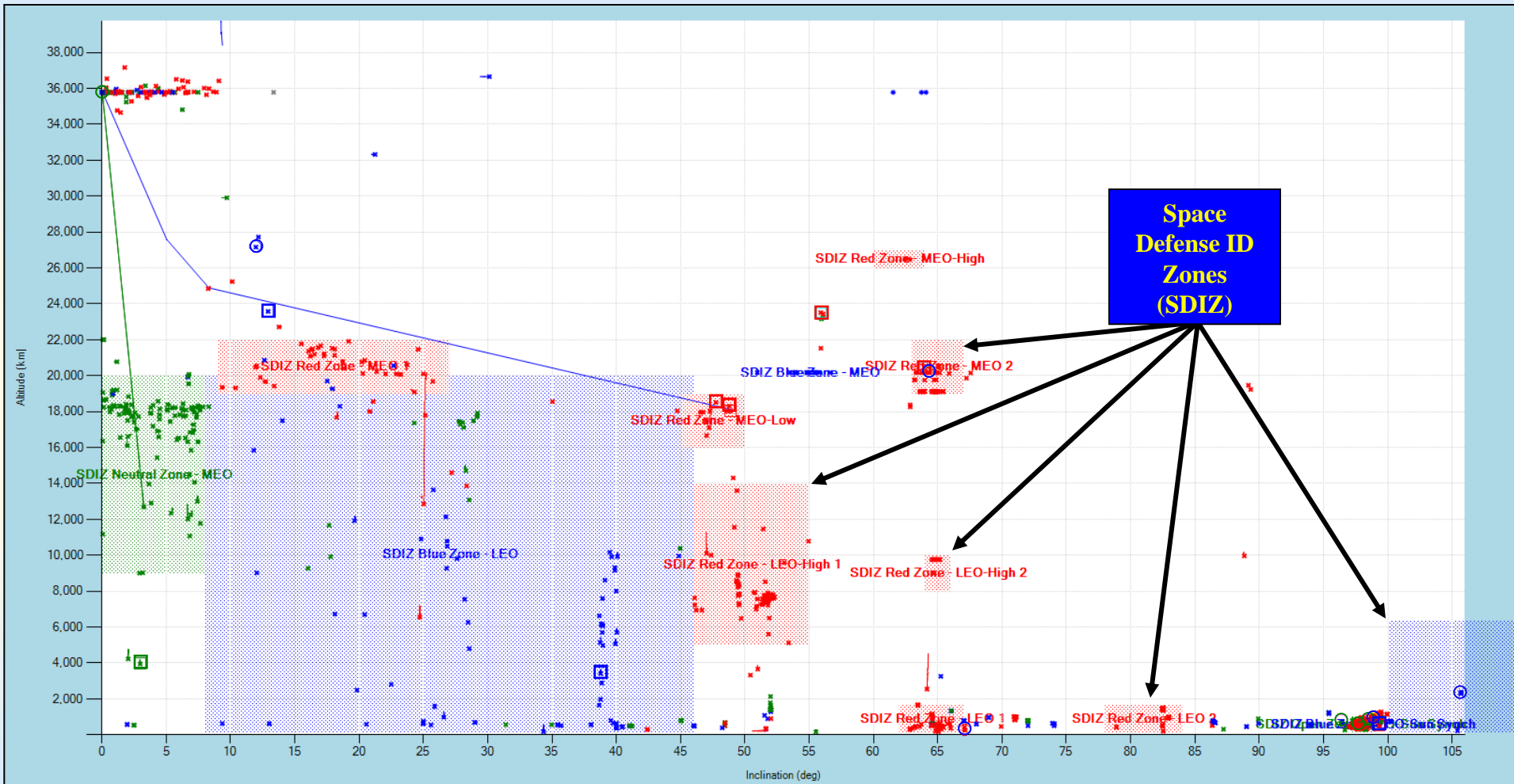
Space Objects Orbital Changes Are Easy to Identify

SAW – View 2



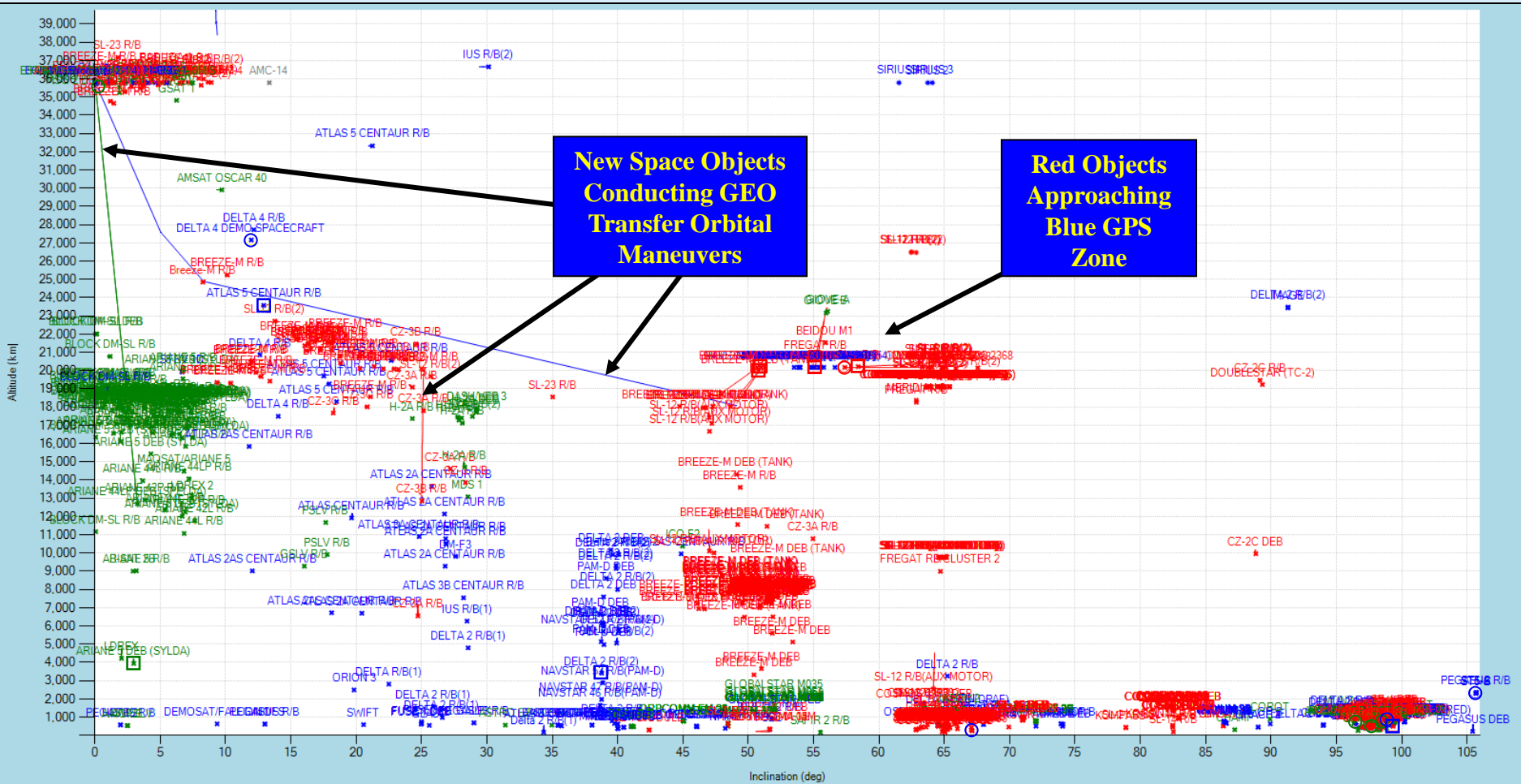
Space Debris Clouds & Their Source Can Easily be Viewed

SAW – SDIZ



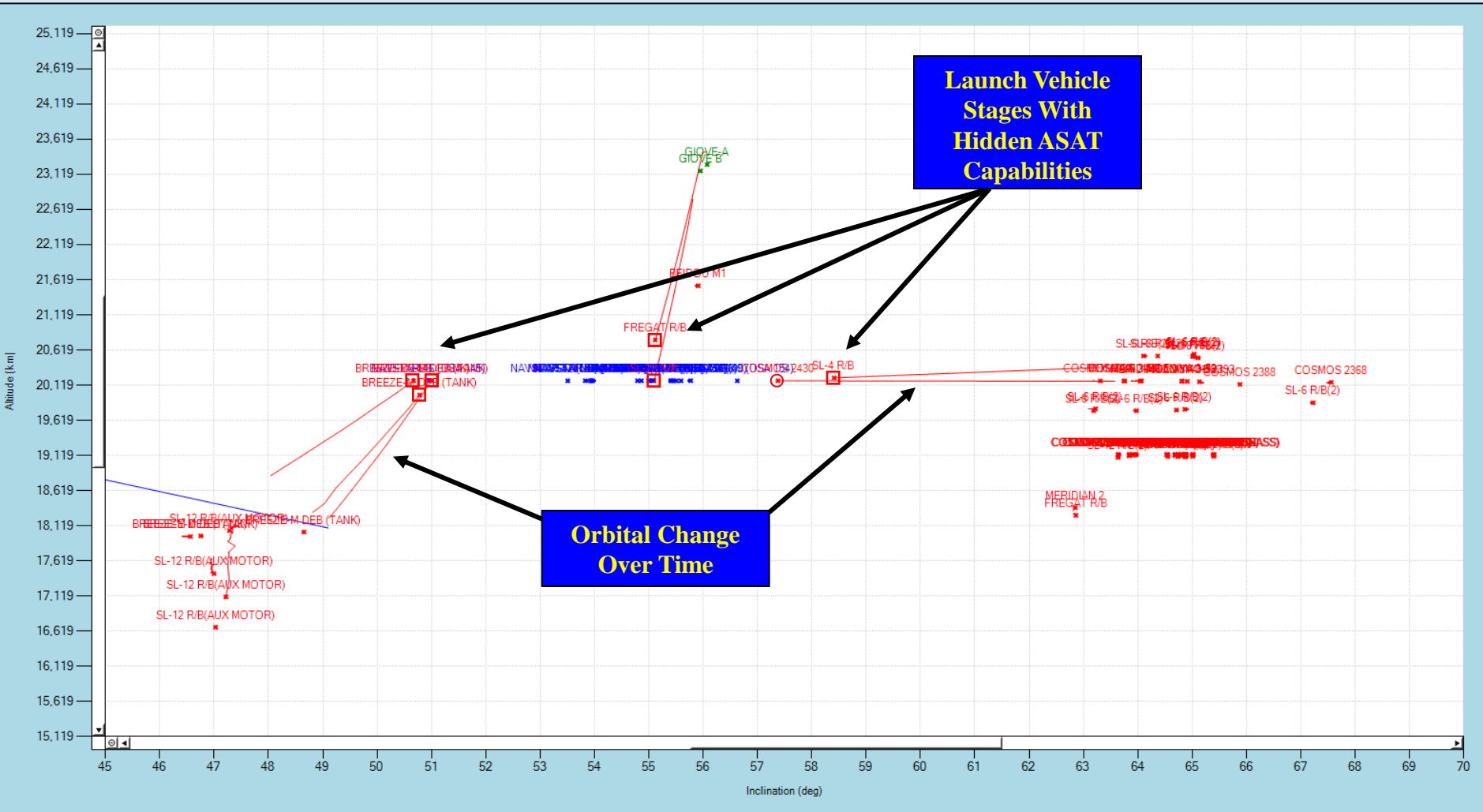
SSA Detection Zones Help Partial Out Operational Responsibility

SAW – Simulated Attack Against GPS



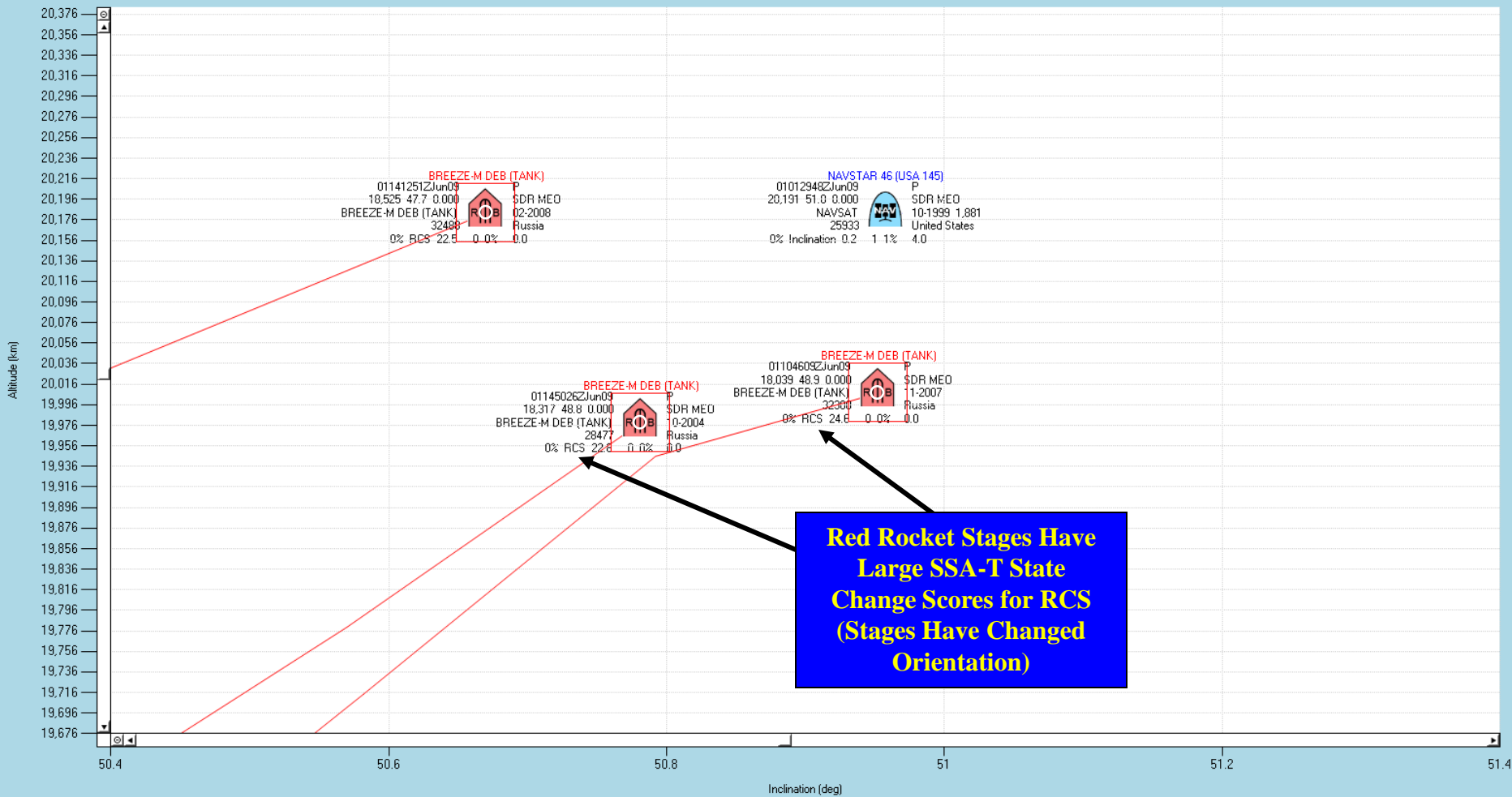
Major Maneuvers of Space Objects are Easily Visualized

SAW – “Dead” Stages as ASATS



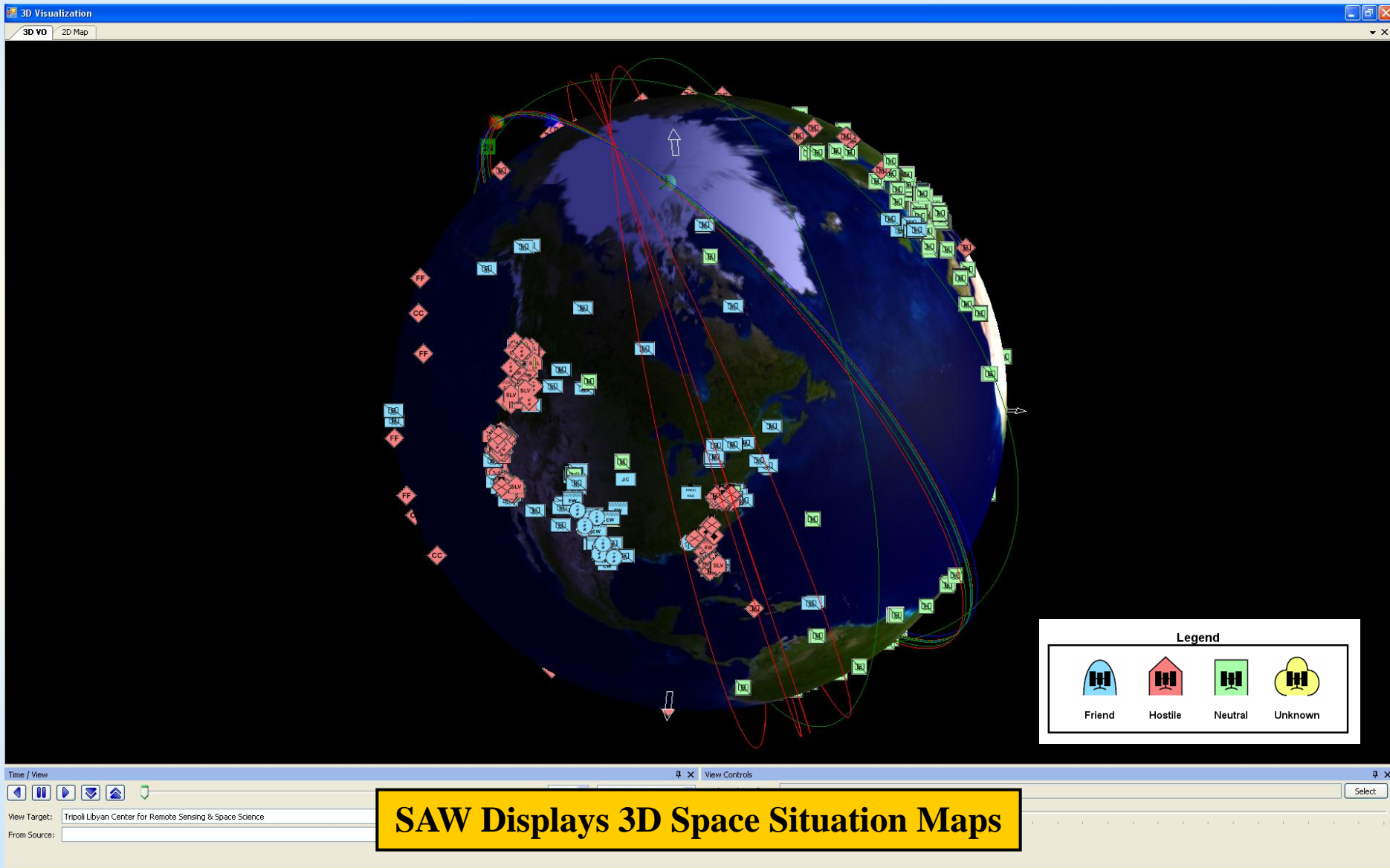
Simultaneous Attack Maneuvers Can Easily be Detected

SAW – Multiple Attacks Against One GPS

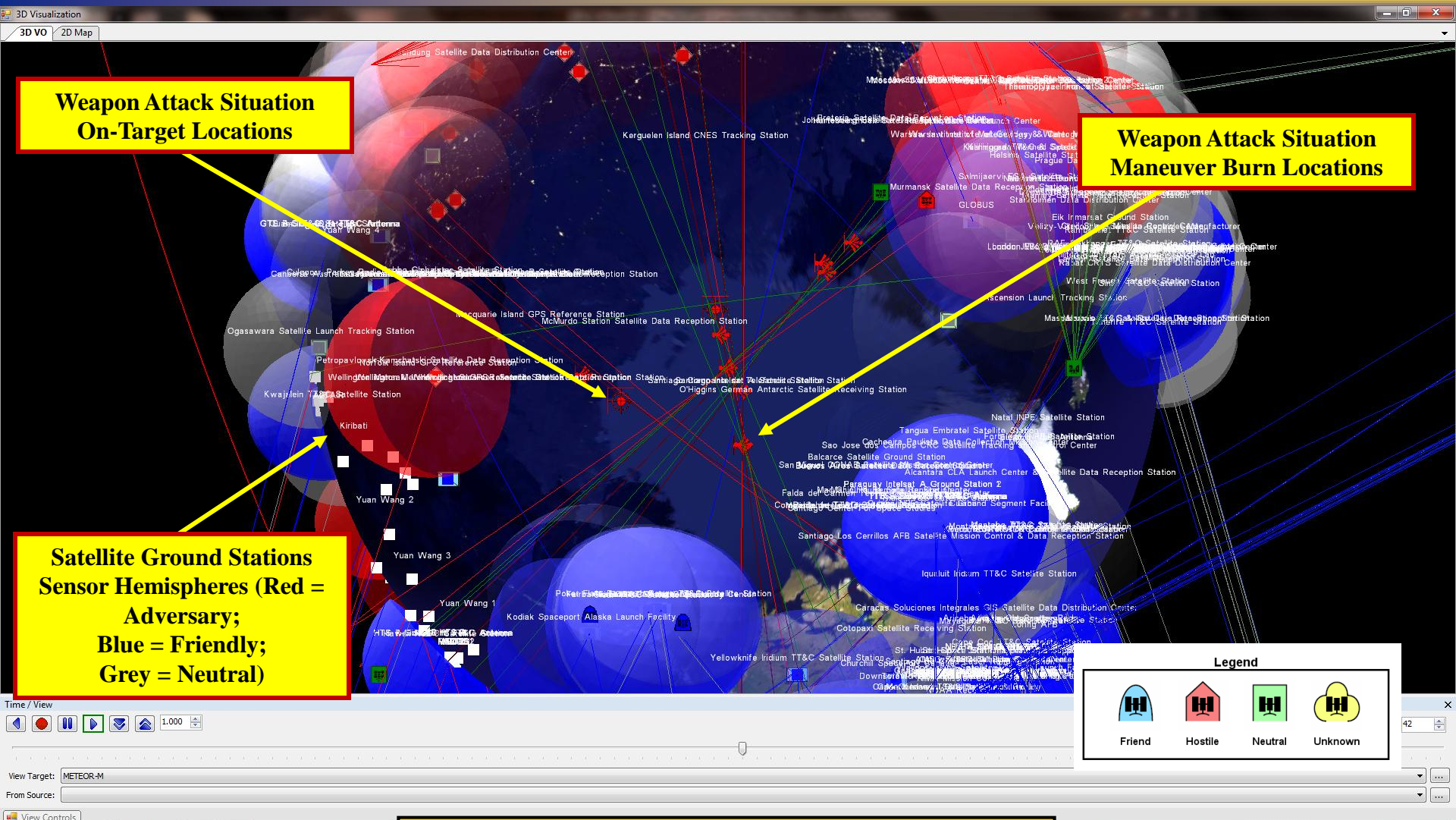


Space Objects Playing Dead Can be Detected With Unusual Movements

SAW – 3D View (1)



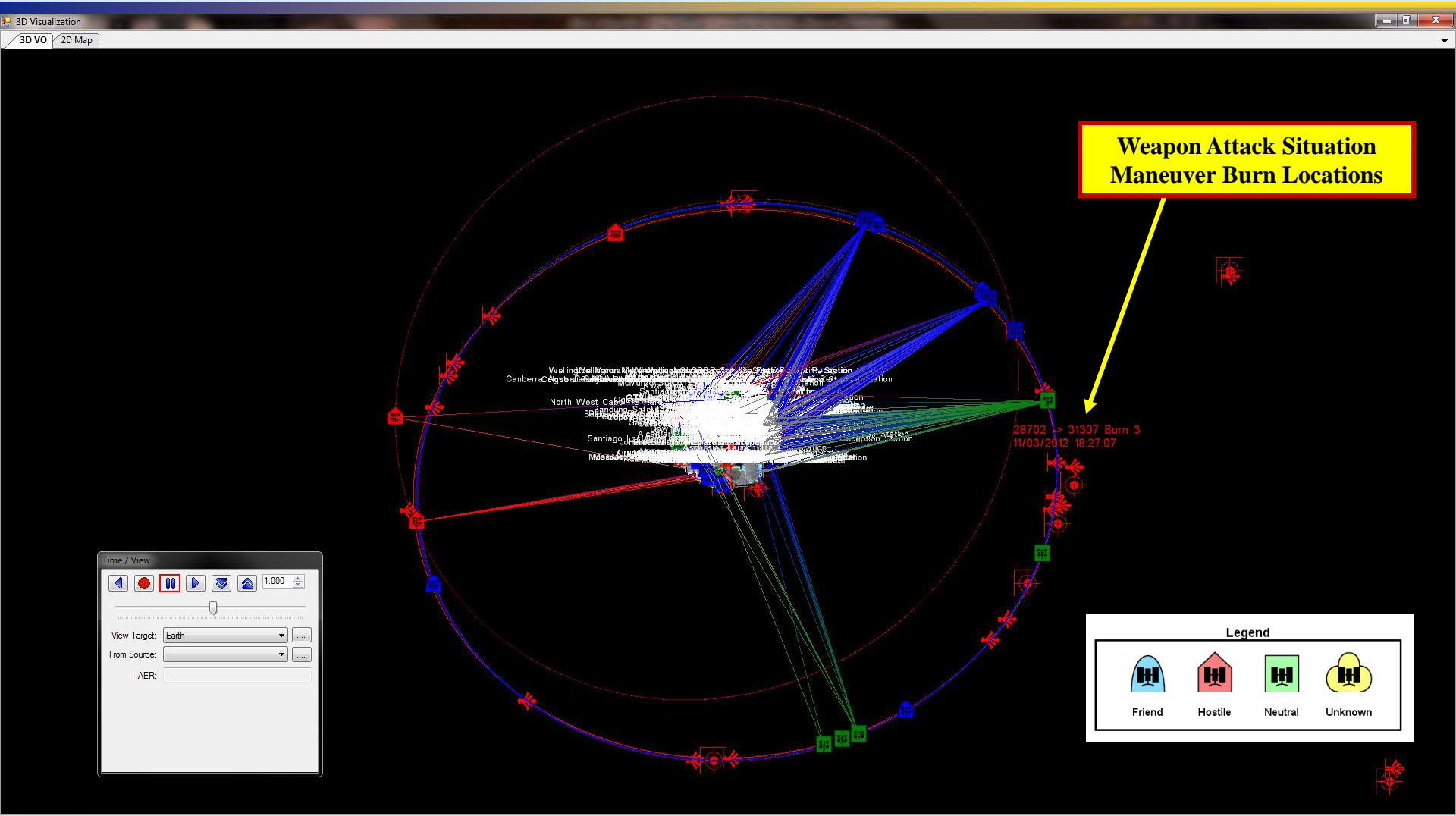
SAW – 3D View (2)



SAW Displays 3D Space Situation Maps



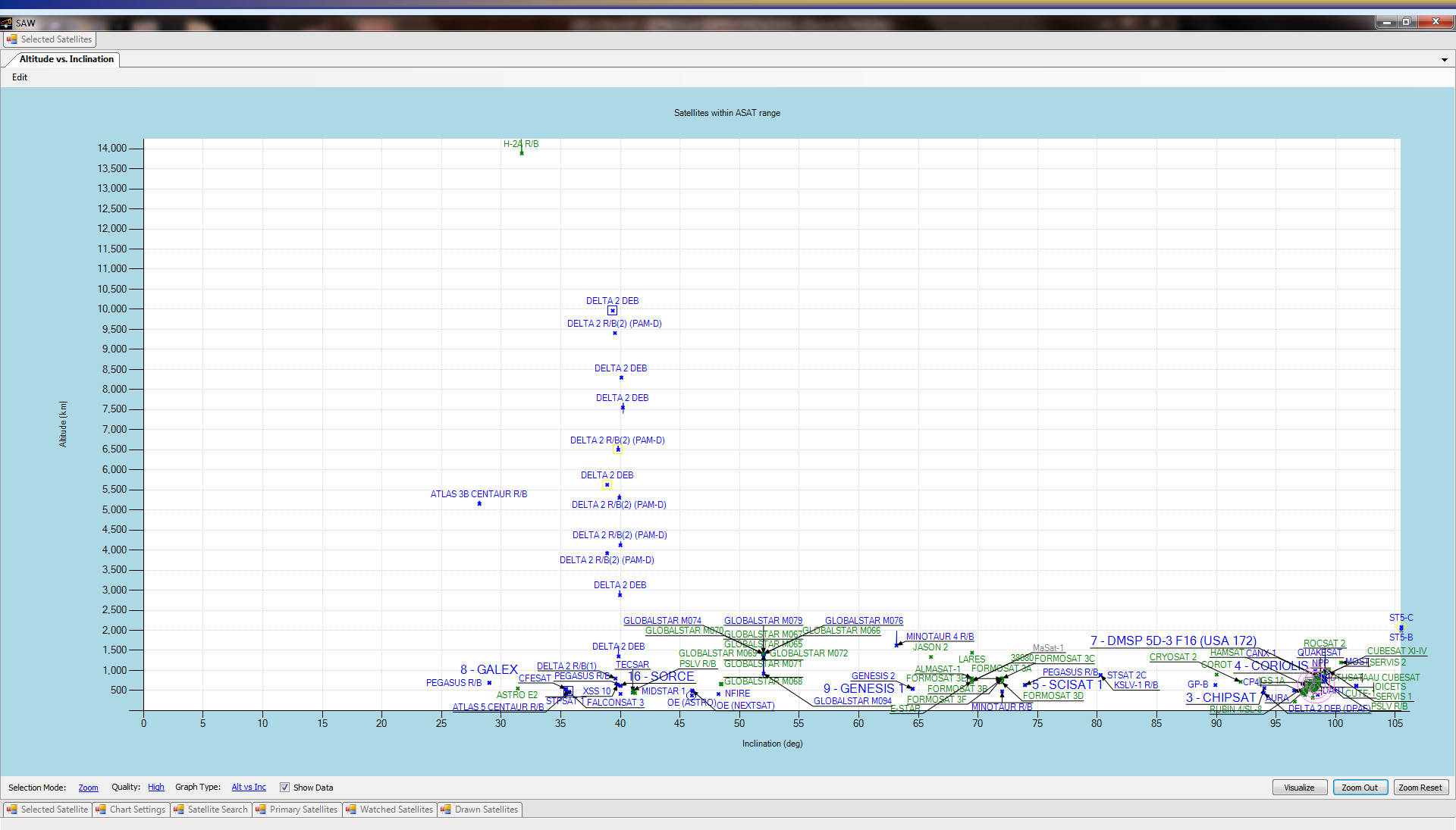
SAW – 3D View (3)



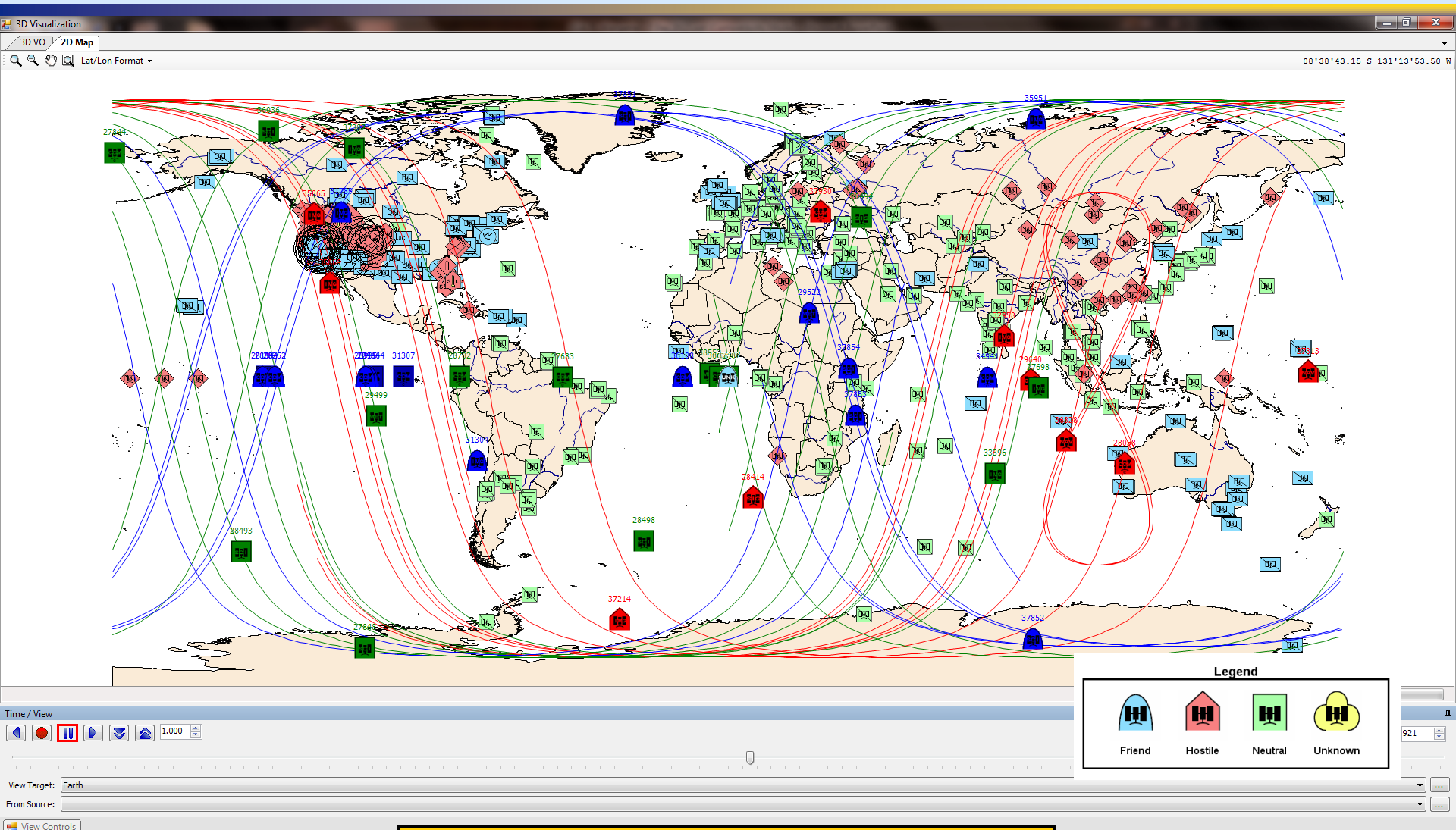
SAW Displays 3D Space Situation Maps



SAW – Space Objects Within Weapons Range



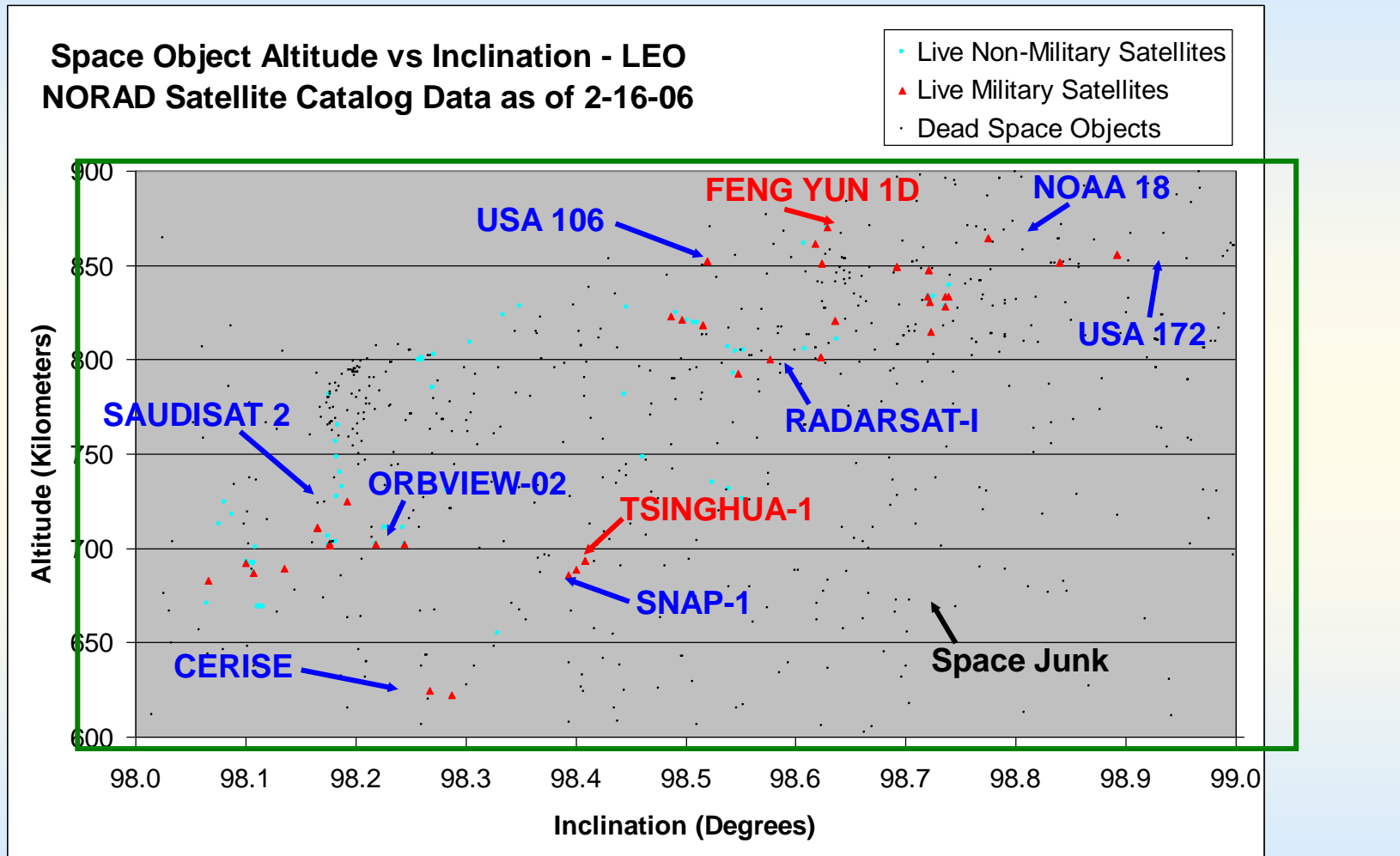
SAW – Flat Map View



SAW Displays 3D Space Situation Maps

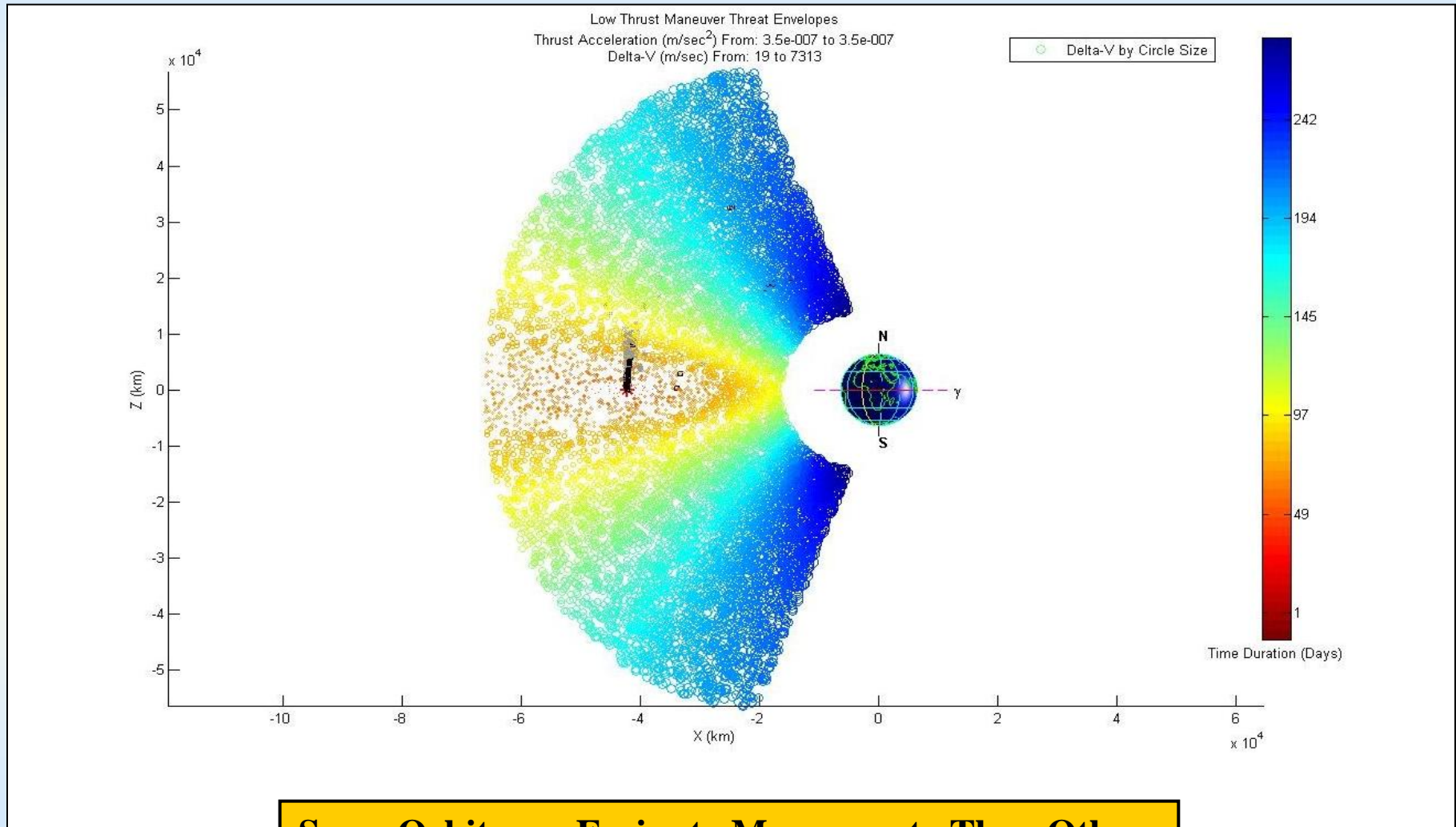


Space Choke Points

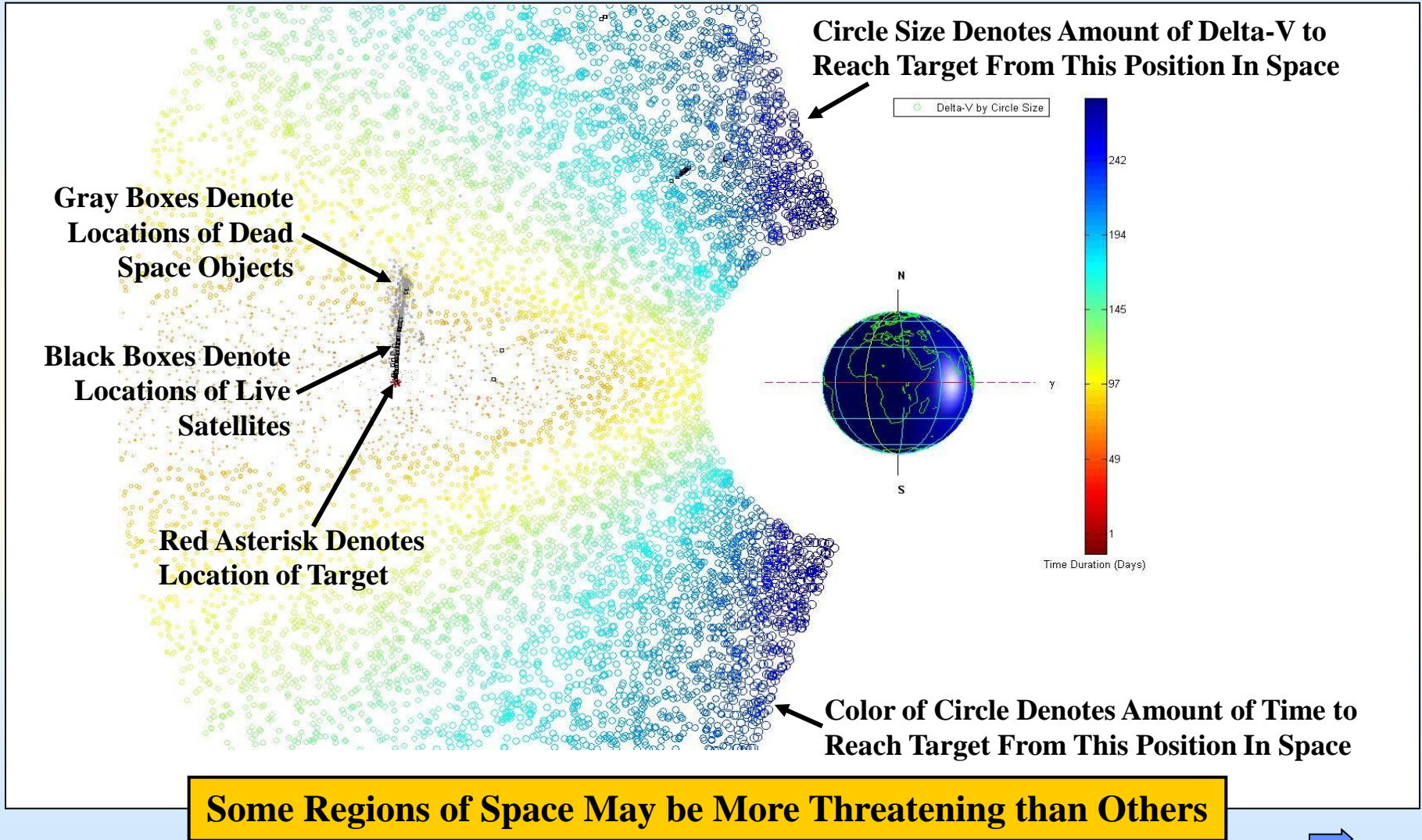


There are Many Potential Sources of Attack

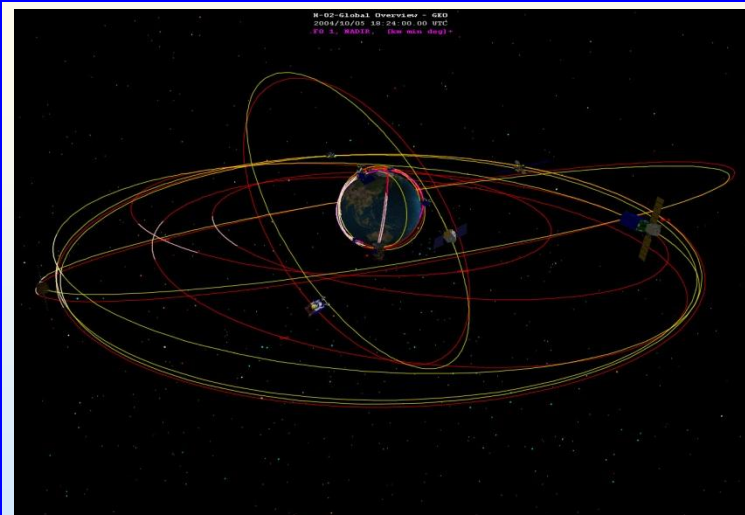
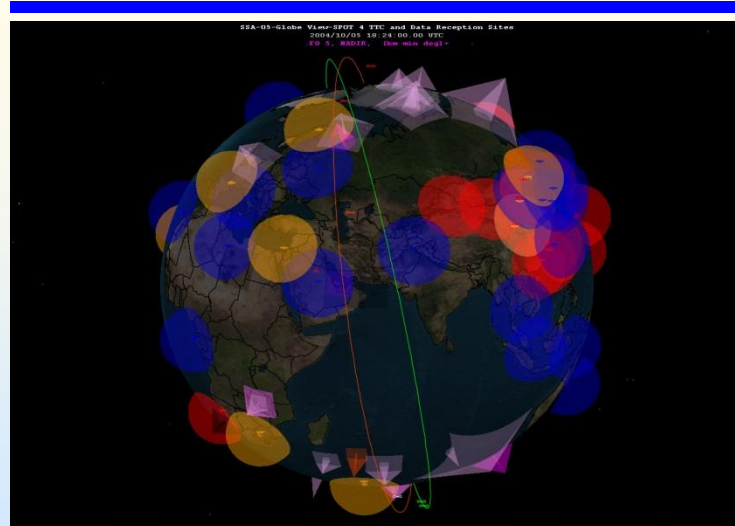
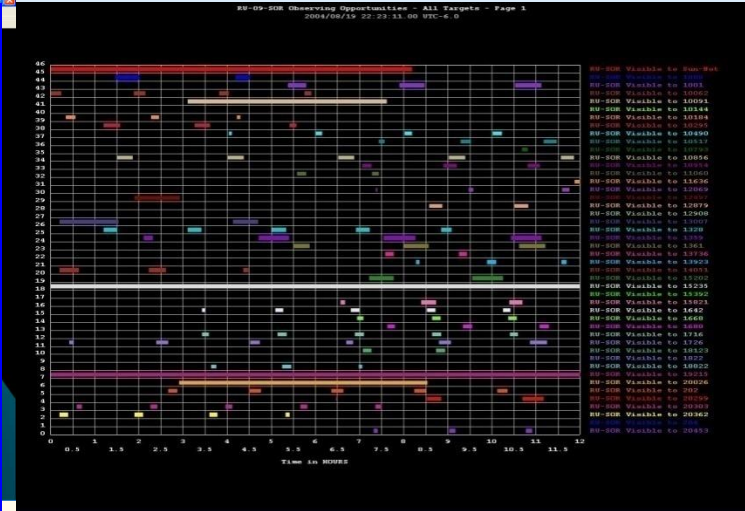
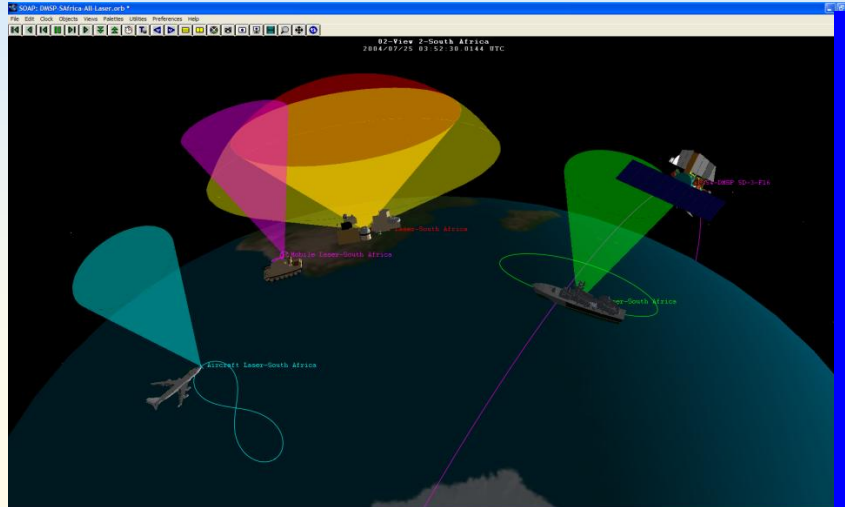
Example Threat Envelope View 1



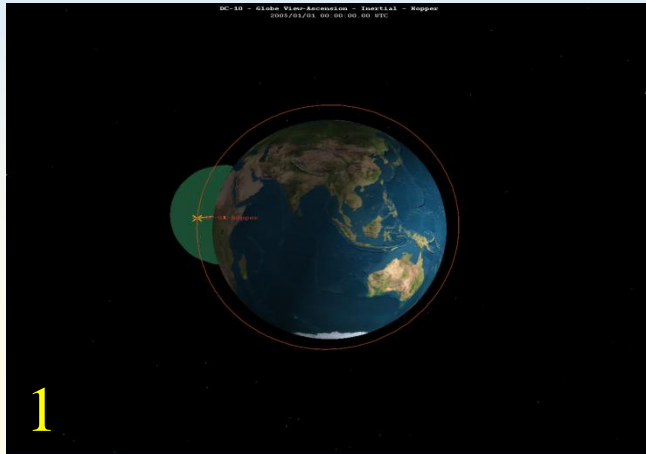
Example Threat Envelope View 2



ASAT Range / Access Assessments



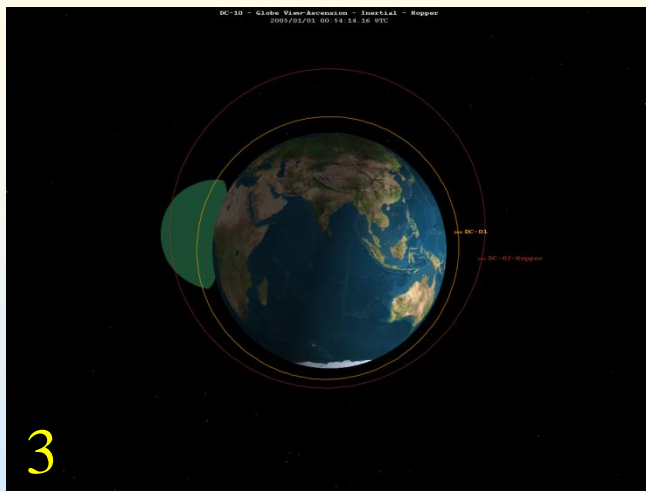
Avoid Space Radar - Hopper



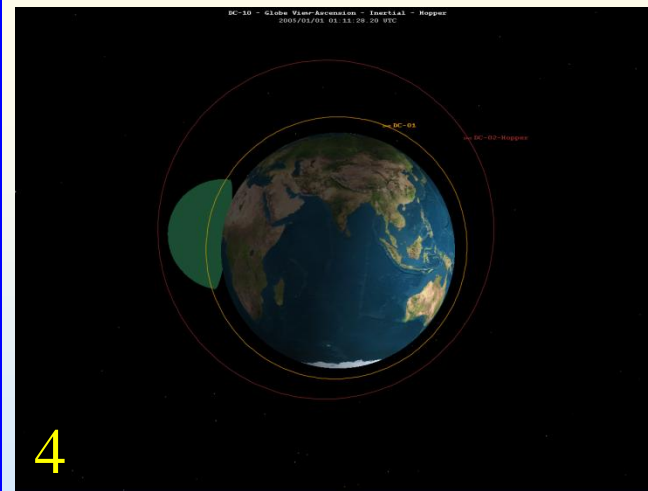
1



2

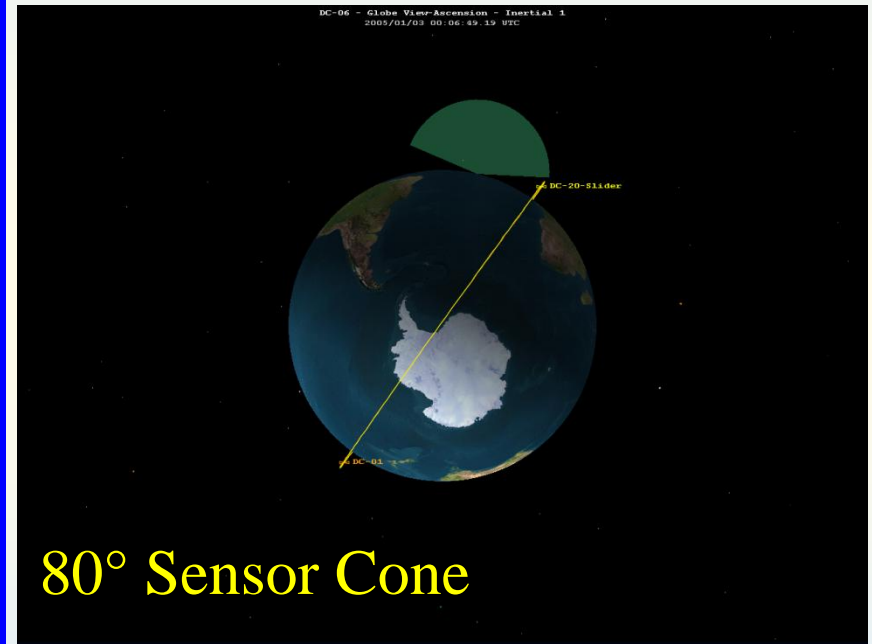
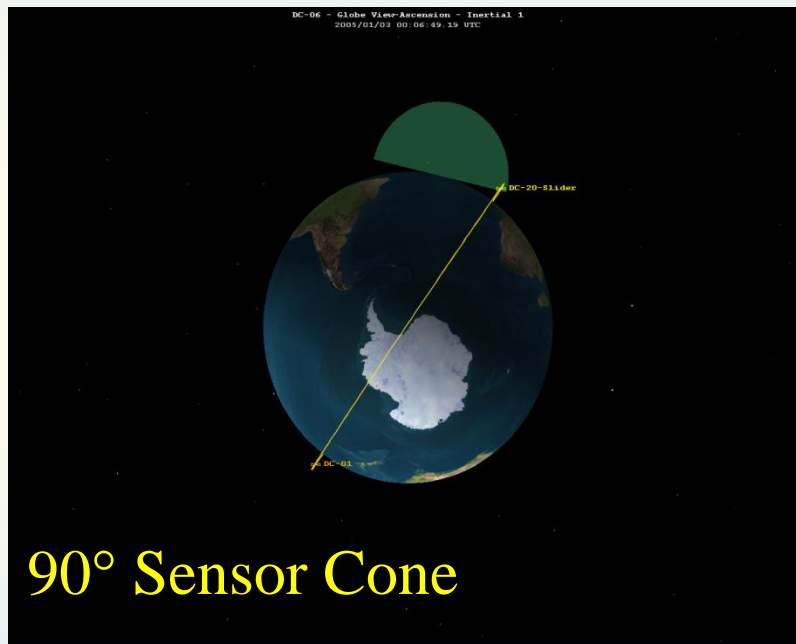


3

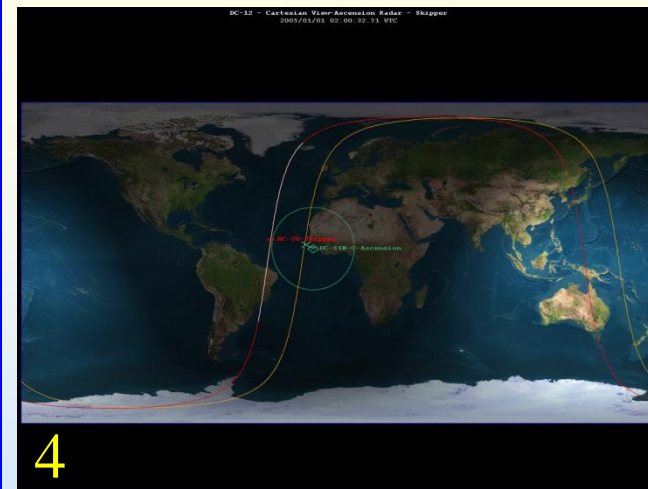
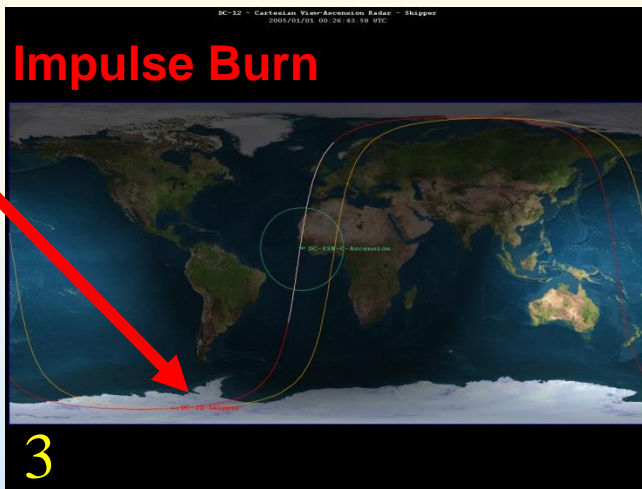
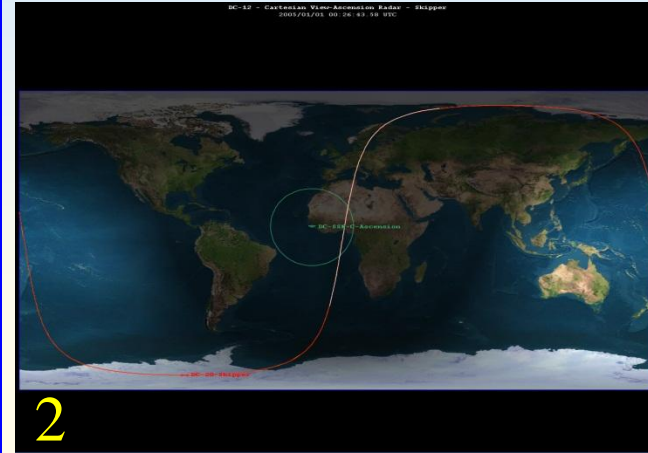
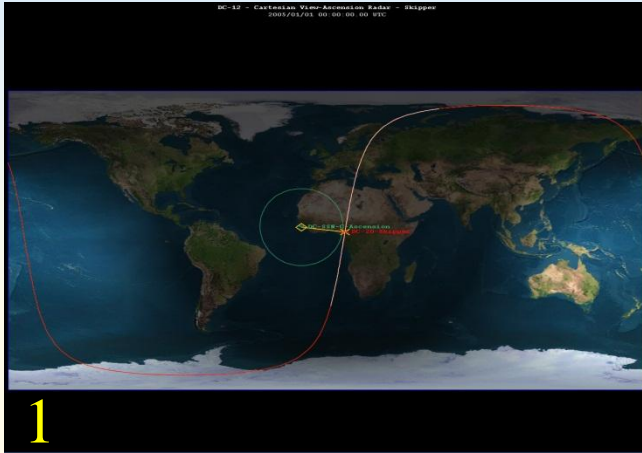


4

Avoid Space Radar - Slider

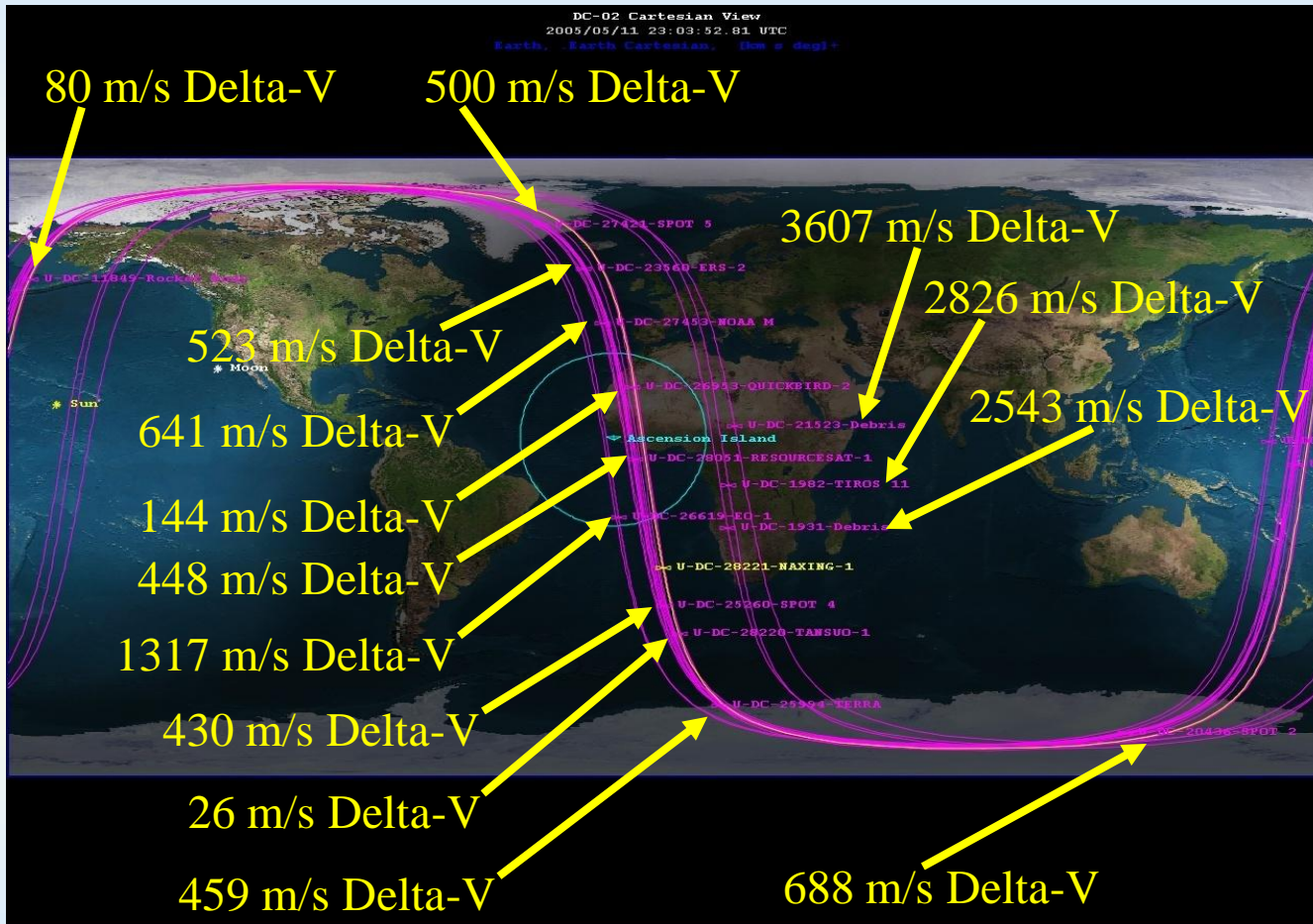


Avoid Space Radar - Skipper



2.6 Km/Sec Impulse Burn

Hide Satellite Among Others



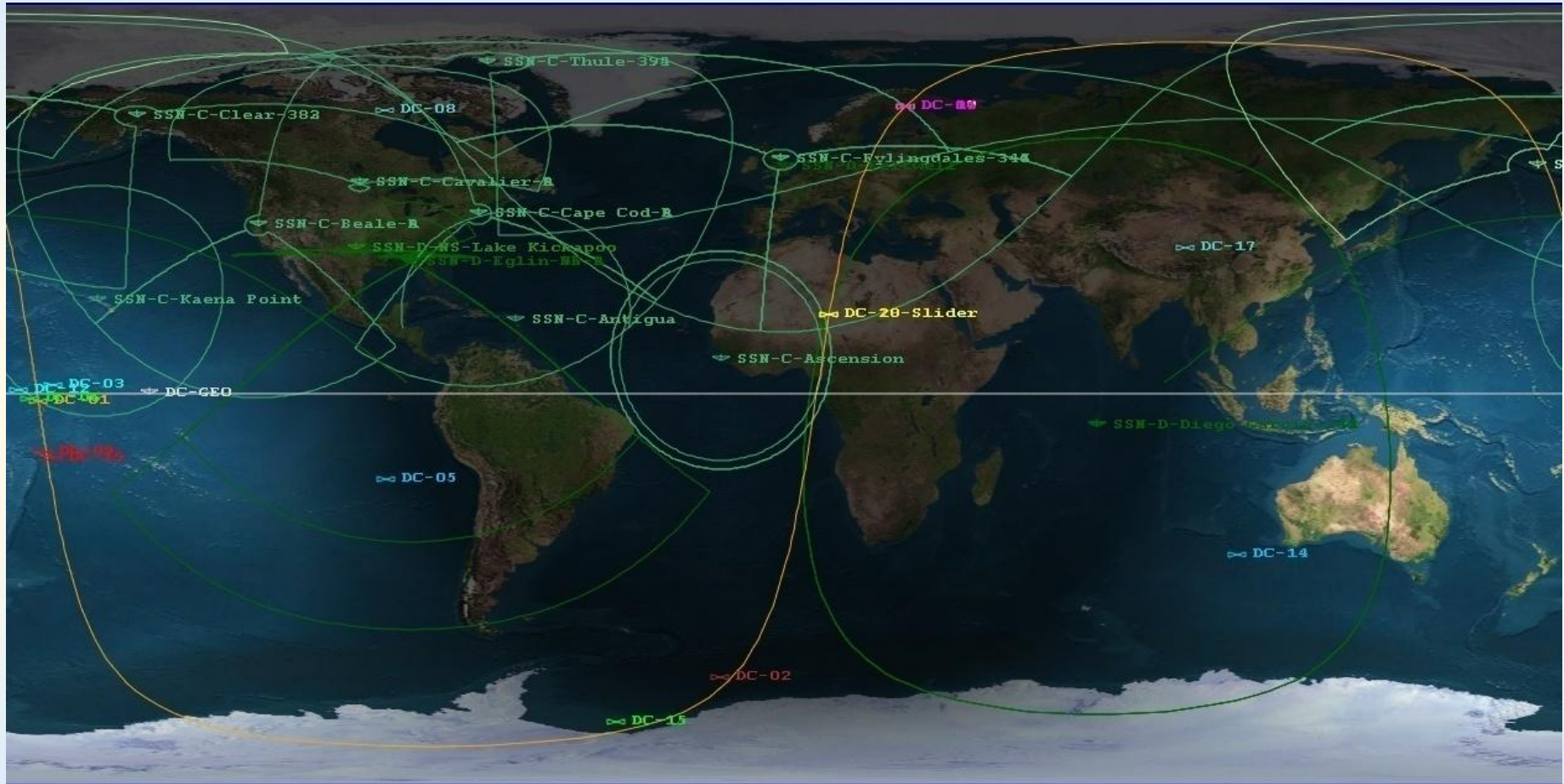
Goal: Appear Like Nearby Satellite

Delta-V Required for 2-Burn Hohmann Transfer Rendezvous

Satellites Can Maneuver to Confuse Targeting Assets



Space Surveillance Network



SSA-T Contacts

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**“Vision without action is daydream.
Action without vision is nightmare”
(Old Japanese Proverb)**

BACKUP

**“It is not the object of war to annihilate those who have given provocation for it, but to cause them to mend their ways.”
- Polybius, History (2nd century B.C.) -**

Principles of War

- **Objective**
- **Offensive**
- **Mass**
- **Economy of Force**
- **Maneuver**
- **Unity of Command**
- **Security**
- **Surprise**
- **Simplicity**

Principles of War Equally Applicable to Space & Terrestrial Warfare

Space Principles of War Example

- Mass

- **Terrestrial:** *“Mass the effects of overwhelming combat power at the decisive place and time”*
- **Space:** Are there sufficient weapons to achieve continuous, or sustained space control. Can the adversary re-configure to avoid attack. Are the space weapons overwhelming to the military function they are trying to deny. Is there political will to implement massed space attack. Can space weapons get into position at the decisive place and time. Do we know the decisive place and time for space weapons application. Can space weapons be synchronized for employment simultaneously.

Space Strategy Planning Has Not Had the Benefit of a Long History

Space Strategies Example

Title:

Herd Space Personnel

Action:

Destroy all Red space-related ground targets, except purposely lightly damage one ground center. Assume that key space support personnel will converge to this lightly damaged site to conduct repairs. 12 hours later, use anti-personnel weapons at this site, with destroy weapons 2 hours later.

Desired Effect:

Destroys Red country's most import space asset: key technically trained space personnel. Also sends message to international community that foreign personnel supporting Red space efforts will be at risk.

War Is Hell

Space Strategies Derived From Sun Tzu

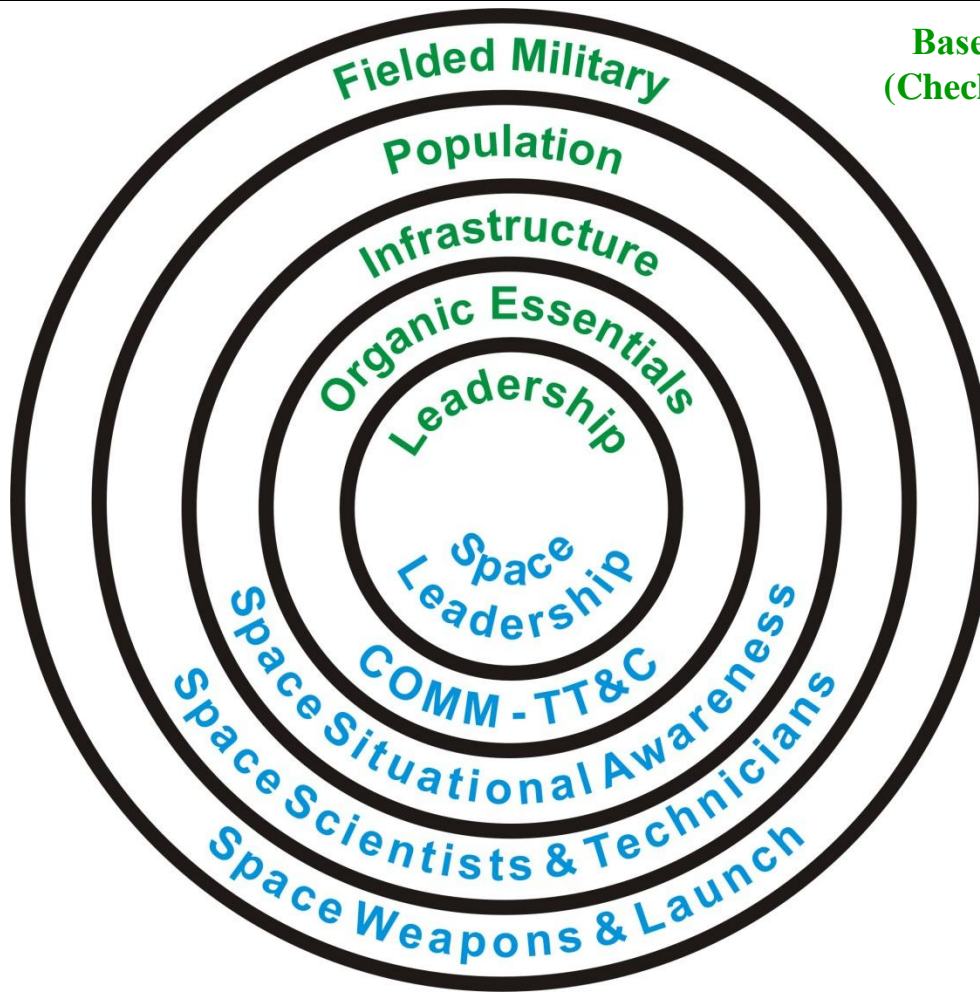
- Sun Tzu's "The Art of War" (544 BC – 496 BC) Used to Derive Modern Space Strategies
- Analysis in Progress
 - 546 Space Warfare Strategies Already Derived
 - Only 1/3 the Way Through Sun Tzu's Teachings

8	Info War
9	Force Status
10	Sun Tzu Statement 1: When able to attack, we must seem unable. When using our forces, we must seem inactive. Pretend to be weak, that he may grow arrogant.
11	Space Warfare Strategy 1: Deploy many covert space weapon systems & sensors with remote basing (air, sea, undersea, ground mobile, space, Moon).
12	Space Warfare Strategy 2: Deploy space weapon systems & sensors with multi-spectral camouflage coverings.
13	Space Warfare Strategy 3: Deploy space weapon systems & sensors in space with low observables coatings.
14	Space Warfare Strategy 4: Deploy space weapon systems & sensors in space with special shapes that do not readily reflect light back to the Earth.
15	Space Warfare Strategy 5: Deploy space weapon systems & sensors in space that can change attitude so they do not readily reflect light back to the Earth.
16	Space Warfare Strategy 6: Deploy covert space weapon systems & sensors in unusual orbits to avoid detection and precise targeting (highly eccentric, Lagrangian points, between geosynchronous orbits and the Moon, & beyond the Moon).
17	Space Warfare Strategy 7: Deploy covert space weapon systems & sensors that continuously change their orbits while outside an adversary's sensor coverage (e.g., maneuver over the South Pacific and the Poles). Continuous low-level thrusting may frustrate or blind sensors.
18	Space Warfare Strategy 8: Develop covert space weapon systems that hide inside innocuous space objects (civilian & science missions; space objects playing dead). Have exit doors on side of space object away from the Earth (zenith face) & most sensors.
19	Space Warfare Strategy 9: Develop some overt space weapon systems that stay in garrison, or are transported to other theaters that do not threaten the theater that one is planning to attack.
20	Space Warfare Strategy 10: Develop some overt space weapon systems that have limited technical and operational capabilities and appear to be the main space threat, but a covert weapon system is actually firing at the same time as the overt system.
21	Space Warfare Strategy 11: Develop some overt space weapon systems that have limited technical and operational capabilities and that will absorb an adversary's main spoiling or counter-attacks (including SOF, HUMINT, & Cyber attacks that may take considerable time).
22	Space Warfare Strategy 12: Develop some overt civil & commercial space systems that can also have space weapons capabilities (e.g., space maintenance robot).
23	Space Warfare Strategy 13: Develop a plan for space sensors to "ping" space objects according to a harmless, pre-planned schedule that does not reveal plans for a surprise attack against intended targets.
24	Space Warfare Strategy 14: Encourage allied space sensors to "ping" only space objects that are not part of an overall surprise attack plan.
25	Space Warfare Strategy 15: Do not deploy non-space forces in any threatening way, or deploy them in theaters other than those one intends to support with space weapons.
26	Space Warfare Strategy 16: Have the State Department devote considerable energy in emphasizing different political and social theaters that do not point to the intended targets and theater of the surprise attack.
27	Space Warfare Strategy 17: Have the State Department devote considerable energy in emphasizing no first use of space weapons.
28	Space Warfare Strategy 18: Have the State Department devote considerable energy in emphasizing no use of debris-causing space weapons, especially if these types of weapons will be used in the surprise attacks.
29	Space Warfare Strategy 19: Have the Military Departments devote some energy in emphasizing possessing limited, if any, space weapons capabilities.
30	Space Warfare Strategy 20: Develop alliances and treaties with more capable space partners so that you may make use of their space weapon systems in times of war.
31	Space Warfare Strategy 21: Deceive, Deny, Disrupt, Degrade, or Destroy adversary space sensors and intelligence collection capabilities. This includes use of cyber weapons and counterintelligence techniques. Cover up when adversary space intelligence collection capabilities are degraded.
32	Space Warfare Strategy 22: Shield indicators of space weapons beginning attack sequences (maneuvering, thrusters warming up, thrust plumes in space, other powering up, increased thermal signatures, new systems coming on-line, increased telemetry traffic, etc.).
33	Space Warfare Strategy 23: Fake the deaths of various satellites with covert, reserve space weapons missions, over a period of months and years before the surprise attacks.
34	Space Warfare Strategy 24: Determine the most threatening regions of space to pre-position space weapons for the best coordinated & optimized attack sequences. These are not necessarily physically close to the targets, but are close in orbital space (minimize travel time).
35	Space Warfare Strategy 25: Concentrate space forces only at the last moment before attack.
36	
37	Sun Tzu Statement 2: By discovering the enemy's dispositions and remaining invisible ourselves, we can keep our forces concentrated, while the enemy's must be divided. Let your plans be dark and impenetrable as night, and when you move, let your movement be like lightning.
38	Space Warfare Strategy 26: Develop & employ covert space surveillance systems.
39	Space Warfare Strategy 27: Only openly report space surveillance capabilities that are less capable (range, sensitivity, throughput, numbers of systems, mobility of systems, etc.) than reality.
40	Space Warfare Strategy 28: Hide space surveillance systems communications & data rate channels.
41	Space Warfare Strategy 29: Be careful of which & how many orbital elements are reported openly, so as not to give a potential adversary an idea of your space surveillance system's full capabilities.
42	Space Warfare Strategy 30: Conduct multiple fake space system maneuvers (& terrestrial mobility re-deployments) to draw away an adversary's space systems from the main point of attack.
43	Space Warfare Strategy 31: Conduct multiple small space system attacks to draw away an adversary's space systems from the main point of attack.
44	Space Warfare Strategy 32: Detect, understand & monitor both allied and adversary space choke points and centers of gravity (geographic, orbital, communications, social, doctrinal, etc.).
45	Space Warfare Strategy 33: Truly understand not only your adversary's space force status and dispositions, but also allied force status and dispositions. Do not let security restrictions obscure to competent commanders the true capabilities of your own forces, or of your allies.
46	Space Warfare Strategy 34: Concentrate anti-satellite resources only against key regions of space (sun-synchronous, part of the geo-synchronous belts, etc.) that are significant Centers Of Gravity both for allied and adversary space systems. Gain space superiority.
47	Space Warfare Strategy 35: Concentrate attacks against key regions of space only at the last moment when a shock & awe effect is warranted. For example, attack portions of the GEO belt from trans-lunar, vacant GEO belt sectors, highly eccentric orbits that are not used for GEO, etc.
48	Space Warfare Strategy 36: To attack Low Earth Orbits (LEO) space systems, use low inclination (close to zero degrees) anti-satellite systems that only need to increase altitude to engage their targets (low delta-v maneuver), yet would have little adversary space system impact.
49	Space Warfare Strategy 37: Employ mobile anti-satellite systems to attack adversary space systems, particularly those that can be based in regions of low or no adversary space surveillance coverage (e.g., South Pacific, South Pole, Equatorial regions, etc.), to evade detection.
50	Space Warfare Strategy 38: Pre-conflict, have very visible, but relatively harmless, space control development programs, while the real space weapon systems are covertly developed.
51	Space Warfare Strategy 39: For kinetic kill anti-satellites, deploy more than one on the same booster, so that subsequent ASATs can hide in the debris clouds of the first attack. They can also act as multiple weapons on target to increase probability of kill (Pk).

Methods of War Are Eternal

Space Centers of Gravity Model

Based On Col John Warden's
(Checkmate) 5-Ring COG Model



Space Equivalent
5-Ring COG Model

Space Systems Strategic Targeting Is Similar to Terrestrial Targeting Strategies

Example Space Centers of Gravity

Launch corridors
GEO belt sectors
Sun-Synchronous LEO orbits
GEO satellites changing orbital position
Space-related command centers / commanders / INTEL Centers
Space surveillance systems
Space technicians / scientists
Electric grid serving ground space facilities
Space design and manufacturing facilities
Leader's confidence in their new space technologies
Blue and Red side political will to start and continue a space war
Space-related decision cycle times (OODA loops)
Low delta-v/transit time points in space to reach High Value Targets
Points in space with high/low coverage from space surveillance assets
Regions of space and time with advantageous solar phase angles
Times of high solar storm activity
On-orbit spares or launch replenishment or ability to reconstitute space capability with terrestrial systems
Antipodal nodes 180 degrees from launch sites around the world
Manned launch (Shuttle, Space Station) of satellites
Initial satellite checkout after launch or orbital insertion
Periods of solar eclipse / low battery charge for satellites
Approach trajectories outside the field of regard of the target's on-board sensors
Approach trajectories when the Sun/Moon/Earth is in the background of a target's sensors
Approach trajectories outside normally employed orbits
Near a satellite's thrusters
Near a satellite's high power antennas
Just after loss of contact with adversary satellite ground controllers / space surveillance assets

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SSA-T Has Extensive Space Centers of Gravity Checklists

SSA-T Automatic Determination of Red Space Attack Strategies

- **Database of Possible Red Space Attack Strategies are Linked to Checklist of INTEL Indicators of Space Systems Activities**
- **Most Probable Red Space Strategy Is Determined Based On Currently Observed INTEL Indications of Space Activities**
- **SSA-T Automatically Increases Space INTEL Collection Priorities In IPB Tasking Forms Based On Probable Red Actions**

SSA-T Helps the Satellite Analyst Determine If Space Systems Are Under Attack

INTEL Indicators Example

1.2.5.1.5.21	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Wear On Roads at Sites
1.2.5.1.5.22	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Improved / New Roads at Sites
1.2.5.1.5.23	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Improved / New Parking at Sites
1.2.5.1.5.24	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Improved / New Railroad Tracks at Sites
1.2.5.1.5.25	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Improved / New Railroad Sidings at Sites
1.2.5.1.5.26	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Disturbed Vegetation / Soil at Sites
1.2.5.1.5.27	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Different Communications Patterns To / From Sites
1.2.5.1.5.27.1	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Communications Traffic To / From Sites
1.2.5.1.5.27.2	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Decreased (More Attempts to Hide) Communications Traffic To / From Sites
1.2.5.1.5.27.3	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers No Net Increase or Decrease of Communications Traffic To / From Sites, But Changed Patterns
1.2.5.1.5.27.4	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Encrypted Communications Traffic To / From Sites
1.2.5.1.5.28	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Hours / New Shifts for Personnel at Sites
1.2.5.1.5.29	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Scientists & Engineers at Sites
1.2.5.1.5.30	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Military Personnel at Sites
1.2.5.1.5.31	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Military Personnel of Higher Ranks at Sites
1.2.5.1.5.32	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Foreign Personnel at Sites
1.2.5.1.5.33	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of VIPs at Sites
1.2.5.1.5.34	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Housing Demand In Local Area
1.2.5.1.5.35	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers New / Expanded / Improved Housing Built On-Site
1.2.5.1.5.36	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers New / Expanded / Improved Recreational Facilities On-Site
1.2.5.1.5.37	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Food Intake
1.2.5.1.5.38	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Power Consumption
1.2.5.1.5.39	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Water Consumption
1.2.5.1.5.40	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Sewer Outake
1.2.5.1.5.41	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Refuse Outake
1.2.5.1.5.42	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Smoke Plumes from Sites
1.2.5.1.5.43	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Chemical Contamination at Sites
1.2.5.1.5.44	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers New or Increased Settling / Effluents Ponds at Sites
1.2.5.1.5.45	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Use of Data Processing Assets at Site
1.2.5.1.5.46	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased / Different Patterns of Thermal Images
1.2.5.1.5.47	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Large Mobile Vehicles with Erection Gantries at Sites
1.2.5.1.5.48	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Mobile Vehicles with Cooling at Sites
1.2.5.1.5.49	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Chemical Support Equipment at Sites
1.2.5.1.5.50	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Optical Test Equipment at Sites
1.2.5.1.5.51	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of RF Test Equipment at Sites
1.2.5.1.5.52	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Electrical Test Equipment at Sites
1.2.5.1.5.53	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Optical Test Stands at Sites
1.2.5.1.5.54	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of RF Test Stands at Sites
1.2.5.1.5.55	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Number of Large Mobile Vehicle Storage Sheds at Sites
1.2.5.1.5.56	Chicanean Yuan Hsi Mobile Direct Ascent ASAT Manufacturing Centers Increased Security at Sites

Example Space Objectives

⋮ ← 5,000 Other Space Objectives

Blind Blue capabilities to observe the terrestrial battlefield
Blind Blue capabilities to observe space from terrestrial sensors
Blind Blue capabilities to observe space from space-based sensors
Spoof Blue capabilities to observe the battlefield
Deny Blue ability to launch new satellites
Destroy some Blue space capability as a warning to Gray space systems support to Blue
Wear down Blue Defensive Counter-Space capabilities by instigating multiple false alarm attacks
Attack Blue satellites before the start of the terrestrial conflict
Spoof Blue perceptions of Red space strengths
Conduct diplomatic offensive to restrict Blue ability to employ ASAT's
Actively defend key launch corridors and orbits critical to Red conduct of war
Preposition Red space assets to maximize their effectiveness at the start of the conflict
Disrupt Blue command and control capabilities for space systems
Embargo Blue access to space systems
Prevent Blue ability to service or re-fuel on-orbit satellites
Develop propaganda campaign against Blue use of ASAT's
Shape and delay Blue plans for space warfare
Deny Blue ability to achieve Space Situational Awareness
Disrupt Blue space attacks so they become uncoordinated
Constantly shift points of application of space control weapons to confuse adversary response
Herd Blue space communications paths to those that are more easily monitored by Red SIGINT assets
Attack key Blue space personnel and technicians
Disperse Red assets (maneuver satellites) just before launching first attack

⋮

SSA-T Has Space Objectives for Both Red & Blue Sides

Example Space COA Indicators

→ Are a small number of Blue and Gray satellites experiencing anomalies over a long time period

Are a small number of Blue and Gray satellites losing contact with terrestrial controllers

Are a small number of new Red satellites appearing in orbit

→ Are a small number of Red satellites changing orientation

Are a small number of Red satellites changing shape

Are a small number of Red satellites changing thermal signatures

→ Are a small number of Red satellites concentrating towards potential Blue and Gray satellites

Are Red ASAT forces appearing to line up in a sequence of timed attacks against Blue and Gray assets

Are Red forces capable of attacking space-related terrestrial sites in Blue countries appearing to line up in a sequence of timed attacks

Are Red SIGINT assets appearing to line up in a sequence of timed operations against Blue and Gray Communications assets

→ Are there indications of Red aircraft activities that appear to concentrate on space-related terrestrial sites around the world

Are there indications of Red missile activities that appear to concentrate on space-related terrestrial sites around the world

Are there a small number of new satellite launches from Red facilities

Many Insignificant Space Indicators May Add Up to Predicting a Major Attack



COA Reactions Example

Time Sequence	Category	Actor	Target	Escalation Ladder	Probability of Occurrence	WBS	Action	Reaction
35	Satellites	Califon	Newmex	P.4.A.1	8	N.S.R.3		Newmex Bicudo Large LEO Photo Satellite is permanently partially blinded when over flying the disputed oil fields
35A	Political	Newmex	Califon	P.1.C.0	1	N.S.R.3.0	→	Do nothing to increase escalation ladder
35B	INTEL	Newmex	Califon	P.1.A.0	10	N.S.R.3.1		Determine if degradation is caused by natural events, equipment failure or human actions, whether intentional or unintentional
35C	Forces	Newmex	Califon	P.1.C.0	9	N.S.R.3.2		Increase military alert level (DEFCON)
35D	Ground Stations	Newmex	Califon	P.1.A.0	9	N.S.R.3.3	→	Contact other Newmexian space-related ground facilities to determine if multiple ground outage incidents are occurring
35E	Satellites	Newmex	Califon	P.1.A.0	9	N.S.R.3.4		Contact other Newmexian TTC ground facilities to determine if multiple satellite outage incidents are occurring
35F	Satellites	Newmex	Califon	P.1.A.0	9	N.S.R.3.5		Check with Newmexian supreme military command to determine if other military incidents are occurring to Newmexian and allied forces
35I	Space Surveillance	Newmex	Califon	P.1.B.0	10	N.S.R.3.8	→	Increase surveillance and tracking for new and suspicious space objects
35J	Satellites	Newmex	Califon	P.1.B.0	10	N.S.R.3.9		Increase mission identification and country of origin determination for new and suspicious space objects (Space Object Identification - SOI)
35K	Satellites	Newmex	Califon	P.1.B.0	10	N.S.R.3.10		Increase signals intelligence collection on new and suspicious space objects
35L	Satellites	Orgonia	Califon	P.1.B.0	10	N.S.R.3.11		Maneuver Orgonian Abragh Nano LEO Inspector Satellite close to Newmex Bicudo Large LEO Photo Satellite for close inspection to help determine origin of mission degradations
35M	Satellites	Newmex	Califon	P.1.B.0	9	N.S.R.3.12		Increase satellite imagery, OPIR and RADAR surveillance and signals intelligence collection of Newmexian border areas
35N	Satellites	Newmex	Califon	P.1.B.0	8	N.S.R.3.13		Increase satellite imagery, OPIR and RADAR surveillance and signals intelligence collection of Newmexian internal areas
35O	Satellites	Newmex	Califon	P.1.B.0	10	N.S.R.3.14		Increase satellite imagery, OPIR and RADAR surveillance and signals intelligence collection of internal Califon activities
35P	Satellites	Newmex	Califon	P.1.B.0	9	N.S.R.3.15		Increase satellite imagery, OPIR and RADAR surveillance and signals intelligence collection of Califon allied activities
35Q	Forces	Newmex	Califon	P.1.A.0	9	N.S.R.3.16		Increase critical infrastructures defenses and surveillance
35AG	Political	Newmex	Califon	P.1.C.0	5	N.S.R.3.32		Cutoff diplomatic relations with Califon
35AP	Political	Newmex	Califon	P.1.B.0	9	N.S.R.3.41		Increase world attention to the problems of orbital space debris in order to slow down Califon's launching of new satellites
35BB	Political	Newmex	Califon	P.1.A.0	10	N.S.R.3.53		Engage in negotiations for space treaties and mutual defense pacts with other countries to increase space defense protection
35BC	Political	Newmex	Califon	P.1.A.0	10	N.S.R.3.54	→	Publicly declare that any use of space weapons against Newmexian satellites will have a corresponding attack on the aggressor's space facilities associated with this attack, whether they be research centers, launch facilities, space surveillance sites, or command and control centers
35BD	Political	Newmex	Califon	P.1.B.0	9	N.S.R.3.55		Publicly declare that any use of space weapons against Newmexian satellites will have a corresponding attack on the aggressor's and their allies space facilities associated with this attack, whether they be research centers, launch facilities, space surveillance sites, or command and control centers
35BE	Forces	Newmex	Califon	P.1.C.0	8	N.S.R.3.56	→	Initiate multiple false starts, threatening space and terrestrial maneuvers, etc. to induce your adversaries to begin constant satellite maneuvering, so as to waste their on-board fuel reserves before actual conflict starts
35BF	Forces	Newmex	Califon	P.1.C.0	8	N.S.R.3.57		Initiate random military orders, communications traffic, re-deployments and satellite maneuvers to confuse potential adversaries of your immediate plans and goals
35BG	Forces	Newmex	Califon	P.1.C.0	7	N.S.R.3.58		Launch or maneuver a new mysterious satellite that comes close to critical Califon satellites, to make Califon pause in its military execution plans, to show resolve, and as a warning to Califon to back down
35BH	ASAT	Newmex	Califon	P.1.B.0	10	N.S.R.3.59		Jam Califon propaganda broadcasts from their communications satellites directed at Newmexian dissidents
35BI	ASAT	Newmex	Califon	P.1.C.0	10	N.S.R.3.60		Initiate operational deployment of Newmexian Anti-Satellite (ASAT) systems

COA Reactions Example (Cont.)

Time Sequence	Category	Actor	Target	Escalation Ladder	Probability of Occurrence	WBS	Action	Reaction
35BJ	ASAT	Newmex	Califon	P.3.A.1	8	N.S.R.3.61		Attack Califon Darapi Large LEO Photo Satellite with a Lagoa Mobile Ground Jammer-RF that temporarily denies Califon access to its intelligence collection capabilities, to show resolve and as a warning to Califon to back down
35BK	ASAT	Newmex	Califon	P.4.A.2	6	N.S.R.3.62		Attack Califon Darapi Large LEO Photo Satellite with an Ouro Space Launch ASAT Ground Mobile Missile that permanently destroys it, to show resolve and as a warning to Califon to back down
35BL	ASAT	Orgonia	Califon	P.3.A.2	9	N.S.R.3.63		Attack Califon Darapi Large LEO Photo Satellite with an Orgonian Dimbabah Nano LEO Mine-Paint that temporarily denies Califon access to its intelligence collection capabilities (covers lenses with temporary paint), to show resolve and as a warning to Califon to back down
35BM	Cyber	Newmex	Califon	P.2.A.0	9	N.S.R.3.64		Attack Califon Jeanton Large Ground Fixed Command Center with a cyber attack that temporarily disables its ability to command forces, to show resolve and as a warning to Califon to back down
35BN	Forces	Newmex	Califon	P.3.A.2	5	N.S.R.3.65		Attack Califon Jeanton Large Ground Fixed Command Center with Newmexian Irece SOF forces that permanently disables its ability to command forces, to show resolve and as a warning to Califon to back down
35BO	Forces	Newmex	Califon	P.2.A.0	5	N.S.R.3.66		Attack a Califon terrestrial system of similar military and economic value to deter Califon from further aggression
35BP	Forces	Newmex	Califon	P.1.C.0	10	N.S.R.3.67		Attack by cyber means the Califon facility that caused the Newmex Bicudo Large LEO Photo Satellite to be temporarily or permanently damaged
35BQ	Forces	Newmex	Califon	P.2.A.0	5	N.S.R.3.68		Attack by Newmexian Irece SOF forces the Califon facility that caused the Newmex Bicudo Large LEO Photo Satellite to be temporarily or permanently damaged
35BR	Forces	Newmex	Califon	P.4.A.2	3	N.S.R.3.69		Attack by the Newmexian Air Force Califon's facility that caused the Newmex Bicudo Large LEO Photo Satellite to be temporarily or permanently damaged
35BY	Industrial	Newmex	Califon	P.1.A.0	10	N.S.R.3.76		Prepare any remaining satellite launch facilities for rapid reaction capabilities enabling quick satellite launches
35BZ	Satellites	Newmex	Califon	P.1.A.0	9	N.S.R.3.77		Increase on-orbit spares for critical satellites
35CA	Satellites	Newmex	Califon	P.1.A.0	9	N.S.R.3.78		Increase on-orbit satellite decoys to confuse Califon and its allies' space surveillance networks
35CB	Satellites	Newmex	Califon	P.1.C.0	8	N.S.R.3.79		Initiate war-reserve modes for critical Newmexian satellite assets that begin to maneuver and reduce RADAR and optical signatures to avoid Califon and its allies' space surveillance networks
35CC	Satellites	Newmex	Califon	P.1.C.0	9	N.S.R.3.80		Recharge Newmexian satellite batteries on-orbit
35CD	Satellites	Newmex	Califon	P.1.C.0	9	N.S.R.3.81		Refuel Newmexian satellites on-orbit
35CE	Satellites	Newmex	Califon	P.1.C.0	9	N.S.R.3.82		Refuel Newmexian space support sites backup generators
35CF	Satellites	Newmex	Califon	P.1.C.0	9	N.S.R.3.83		Maneuver Newmexian space weapons (space-based and terrestrial-based) into optimized offensive and defensive positions
35CG	Satellites	Newmex	Califon	P.1.C.0	9	N.S.R.3.84		Deploy Newmexian space support assets (space-based and terrestrial-based) into optimized offensive and defensive support positions
35CH	Satellites	Newmex	Califon	P.1.C.0	9	N.S.R.3.85		Maneuver and deploy space control assets that later enable sealing off the Earth from adversary satellites, in order to fix these adversary space assets into a steady state that cannot be changed from the ground. This would include positioning for jamming, spoofing and cyber attacks, along with denying an adversary the ability to launch new satellites
35CI	Launch	Newmex	Orgonia	P.1.A.0	8	N.S.R.3.86		Request Orgonia provide satellite launch support from its Nuwayr Space Launch Ground Mobile Systems for Newmexian satellites
35CJ	Forces	Newmex	Califon	P.1.A.0	10	N.S.R.3.87		Explore non-space mission replacements for reduced satellite capabilities
35CP	Forces	Newmex	Califon	P.1.C.0	9	N.S.R.3.93		Increase surveillance, protection and defenses of space systems terrestrial terminals, command and control sites, space sensor sites, launch sites, space weapons marshaling areas, research centers and factories
35CQ	Environmental	Space	Space	P.1.B.0	9	N.S.R.3.94		Increase surveillance of solar events to better determine if potential satellite outages are caused by natural or human intents
35CR	Forces	Newmex	Califon	P.1.C.0	10	N.S.R.3.95		Determine if Califon and/or their allies have terrestrial forces maneuvering or deploying to operational locations and appear to be pre-positioning for attack
35CS	Satellites	Newmex	Califon	P.1.C.0	10	N.S.R.3.96		Command critical Newmexian satellites to initiate defensive measures (spinning, close shutters, increased heat transfer, etc.)
35CT	Satellites	Newmex	Califon	P.1.B.0	9	N.S.R.3.97		Maneuver critical Newmexian satellites beyond the range of potential threats
35CU	Satellites	Newmex	Newmex	P.1.A.0	10	N.S.R.3.98		Conduct a full battery of diagnostic testing on Newmexian satellites to determine if intermittent failures are a possibility
35CV	Launch	Newmex	Califon	P.1.A.0	9	N.S.R.3.99		If critical Newmexian satellites are permanently damaged, then launch other satellites with similar capabilities
35CW	Forces	Newmex	Newmex	P.1.A.0	10	N.S.R.3.100		Determine the effects on the overall space system mission of any space systems degradations
35CX	Forces	Newmex	Newmex	P.1.A.0	10	N.S.R.3.101		Modify previously planned space strategies and tactics due to current adversary and their allies' actions
35CY	Satellites	Newmex	Califon	P.1.A.0	10	N.S.R.3.102		Increase training for satellite operators that allows them to recognize intentional attacks and respond promptly

Space Escalation Ladder

WBS	Conflict Phase	Terrestrial Campaign Phase	Space Campaign Phase	Weapon Type	Space Campaign Phase Full Name	Weapon Category
P.1.A.0	Pre-Conflict	Phase 0: Pre-War Buildup (Shape)	1st Wave Attacks Phase A	Pre-Conflict Deter	1st Wave Attacks Phase A - Pre-Conflict Deter	Overt Weapons Testing & Deployment; Treaties; Saber Rattling; Space Alliances; Normal Space Surveillance, Tracking & Reconnaissance Activities
P.1.B.0	Pre-Conflict	Phase 0: Pre-War Buildup (Shape)	1st Wave Attacks Phase B	Persuade; Spying; Propaganda; Avoidance Maneuvering; Increased Space Surveillance & Close Satellite Inspections	1st Wave Attacks Phase B - Pre-Conflict Persuade	Diplomatic Requests & Démarches; Economic Actions; Embargos; Legal Actions; Administrative Actions; Transmitting Propaganda Broadcasts; Jamming Propaganda Broadcasts; Increased Spying & Surveillance; Unusual Increases in Space Surveillance and Tracking Activities; Satellite Close Inspectors; Threaten Allies of Your Adversaries; Maneuver to Avoid Attacks
P.1.C.0	Pre-Conflict	Phase 0: Pre-War Buildup (Shape)	1st Wave Attacks Phase C	Hide; Covert; Cyber; Political Disruptions; Mobilize Forces; Increase Military Alert Level; Threatening Satellite Maneuvers; Increase Space Radiation; Initiate Satellite Defensive Measures; Employ Nation's Astronauts on International Space Station for Military Uses	1st Wave Attacks Phase C - Pre-Conflict Hide	Camouflage; Stop Activities; Mobility; Covert Technology Developments; Small Covert Attacks; Cyber Attacks; Provocative but False Attacks; Covert Actions in Violation of International Treaties; Cutoff Diplomatic Relations; Inspire Social Disruptions and Agitation; Employ Lethal Force Against Your Own Citizens; Mobilize Forces; Increase Military Alert Level (DEFCON); Maneuver Close Enough to Adversary Satellites to Purposely Appear as a Threat; Reveal Covert Programs to Appear Threatening; Enter Into War-Reserve Modes (Hide) for Critical Satellites; Hide Senior Leadership; Increase Radiation Environment in Orbits Used by Adversaries; Initiate Satellite Defensive Measures; Employ Nation's Astronauts on International Space Station for Military Reconnaissance and Surveillance
P.2.A.0	Trans-Conflict	Phase I: Deployment / Deterrence (Deter)	2nd Wave Attacks	Trans-Conflict Deter	2nd Wave Attacks - Trans-Conflict Deter	Linked Attacks; Demo Attacks; Alternate Country Attacks; Blockades; Major Covert Attacks; Terrorist Attacks; Summarily Execute Saboteurs; Seize & Sequester Suspected Terrorists; Alert Anti-Satellite Systems; Arm Satellite Self-Defense Mechanisms; Alert Anti-Missile Defenses; Alert Anti-Aircraft Defenses; Arm Allied Astronauts on International Space Station

Space Actions May Be Conducted Pre-Conflict

Space Escalation Ladder (Cont.)

WBS	Conflict Phase	Terrestrial Campaign Phase	Space Campaign Phase	Weapon Type	Space Campaign Phase Full Name	Weapon Category
P.3.A.1	Trans-Conflict	Phase II: Halt Incursion (Seize Initiative)	3rd Wave Attacks Phase A1 – Gnd Based	From Terrestrial Partial Temporary Kill	3rd Wave Attacks Phase A1 – Terrestrial-to-Space Partial Temporary Effects	Delay, Deny, Covertly Assassinate Adversary Diplomatic Ambassador
P.3.A.2	Trans-Conflict	Phase II: Halt Incursion (Seize Initiative)	3rd Wave Attacks Phase A2 – Gnd Based	From Terrestrial Total Temporary Kill	3rd Wave Attacks Phase A2 – Terrestrial-to-Space Total Temporary Effects	Disrupt
P.3.B.1	Trans-Conflict	Phase III: Air Counter-Offensive (Dominate)	3rd Wave Attacks Phase B1 – Space Based	From Space Partial Temporary Kill	3rd Wave Attacks Phase B1 – Space-to-Space Partial Temporary Effects	Delay, Deny
P.3.B.2	Trans-Conflict	Phase III: Air Counter-Offensive (Dominate)	3rd Wave Attacks Phase B2 – Space Based	From Space Total Temporary Kill	3rd Wave Attacks Phase B2 – Space-to-Space Total Temporary Effects	Disrupt
P.4.A.1	Trans-Conflict	Phase IV: Joint Counter-Offensive to Restore Friendly Pre-Conflict Status (Stabilize Borders)	4th Wave Attacks Phase A1 – Gnd Based	From Terrestrial Partial Permanent Kill	4th Wave Attacks Phase A1 – Terrestrial-to-Space Partial Permanent Kill	Degrade
P.4.A.2	Trans-Conflict	Phase IV: Joint Counter-Offensive to Restore Friendly Pre-Conflict Status (Stabilize Borders)	4th Wave Attacks Phase A2 – Gnd Based	From Terrestrial Total Permanent Kill	4th Wave Attacks Phase A2 – Terrestrial-to-Space Total Permanent Kill	Destroy
P.4.B.1	Trans-Conflict	Phase V: Joint Counter-Offensive to Capture Adversary Capitol (Enable New	4th Wave Attacks Phase B1 – Space Based	From Space Partial Permanent Kill	4th Wave Attacks Phase B1 – Space-to-Space Partial Permanent Kill	Degrade
P.4.B.2	Trans-Conflict	Phase V: Joint Counter-Offensive to Capture Adversary Capitol (Enable New	4th Wave Attacks Phase B2 – Space Based	From Space Total Permanent Kill	4th Wave Attacks Phase B2 – Space-to-Space Total Permanent Kill	Destroy
P.5.A.0	Trans-Conflict	Phase VI: Defend Against Adversary Counter-Attacks Against Friendly Homeland (Defend Friendly Citizens)	5th Wave Attacks	Space-Manned Permanent Kill: Kill Adversary Astronauts	5th Wave Attacks - Space-Manned Permanent Kill	Degrade, Destroy: Kill Adversary Astronauts on International Space Station
P.6.A.0	Trans-Conflict	Phase VI: Defend Against Adversary Counter-Attacks Against Friendly Homeland (Defend Friendly Citizens)	6th Wave Attacks	Space-to-Earth Permanent Kill	6th Wave Attacks - Space-to-Earth Permanent Kill	Degrade, Destroy
P.7.A.0	Trans-Conflict	Phase VII: Defend Against Adversary Use of Nuclear Weapons in Space (Defend Friendly Military)	7th Wave Attacks	NBC Use - Space	7th Wave Attacks - NBC Use - Space	Degrade, Destroy
P.8.A.0	Trans-Conflict	Phase VIII: Defend Against Adversary Use of NBC Against Friendly Military Targets (Defend Friendly Military)	8th Wave Attacks; Phase A – Military Targets	NBC Use - Space & Terrestrial	8th Wave Attacks Phase A – NBC Use - Space & Terrestrial - Military Targets	Degrade, Destroy
P.8.B.0	Trans-Conflict	Phase IX: Defend Against Adversary Use of NBC Against All Friendly Targets (Defend Friendly Military & Civilians)	8th Wave Attacks; Phase B – Civilian Targets	NBC Use - Space & Terrestrial	8th Wave Attacks Phase B – NBC Use - Space & Terrestrial - Civilian Targets	Degrade, Destroy
P.9.A.0	Post-Conflict	Phase X: Post-Hostilities (Reconstruction & Stabilization)	9th Wave Attacks	Post-Conflict Deter	9th Wave Attacks - Post-Conflict Deter	Diplomatic Requests; Economic Actions; Legal Actions; Administrative Actions; Jamming Propaganda Broadcasts

Space Provides Finer Gradations & Thus Better Control During Conflict Escalation

Space Web Ontology

Space Ontology

- **1,009 Objects: Classes, Properties, Instances**
- **Most Classes Have Documented Instances**
- **Classes:**
 - **Military Objectives & Tasks (8 Levels)**
 - **Conflict Levels**
 - **Campaign Phases**
 - **Success Criteria**
 - **Success Indicators**
 - **Space Battle Zones**
 - **Space Centers Of Gravity**
 - **Space Principles of War**
 - **Space Escalation Ladder**
 - **Space NIIRS**
 - **Satellite Keep-Out Zones**

Space Ontology Example

The screenshot displays a complex ontology interface. On the left is a hierarchical tree of classes and instances. The central pane shows a 'Resource Form' for the instance 'AbsenceLaserDazzling-Space'. The form is divided into several sections: Record Tracking, Course of Action Tracking, Course of Action Descriptors, and Course of Action Details. Each section contains various fields with dropdown menus and text input areas. The right pane shows a list of properties and their values for the selected resource. At the bottom, a table lists instances of the 'AbsenceLaserDazzling-Space' class, showing their URIs, descriptions, and WBS IDs.

Resource Form: AbsenceLaserDazzling-Space

Name: AbsenceLaserDazzling-Space

Record Tracking

Record ID: UNCLASSIFIED

Record Classification: UNCLASSIFIED

Conflict Side: Blue

WBS Tracking Number: CA.SI.5.1.1.4.1.1.1

Work Sponsor: Metatech Corporation IR&D

User Who Entered Data: Paul S. Szymanski

RDFS Comments: Absence of laser dazzling.

Record Comments: Space Objectives and Tasks developed by Paul S. Szymanski.

Data Source: Joint Warrior Interoperability Demonstration (JWID) 2000

Data Source Author: LTC Jim Duffy, USA

Data Source Organization: USSPACECOM/36N

Data Source Document Number: true

Course of Action Tracking

COA Value: true

Who Authorized COA?: JFAC

Was COA Implemented?: false

Country That COA Is Supporting: Califon

Country That COA Is Directed Against: Orgonia

COA Political Acceptability: 8

COA Probability It Will Be Required: 1.0

COA Probability of Successful Completion: 0.8

COA Level: [Empty]

COA Is Most Dangerous to Own Side: [Empty]

COA Is Most Effective Against Opponent: [Empty]

COA Is Most Probable to be Implemented: [Empty]

Course of Action Descriptors

COA Rankings

COA Importance Ranking: 2

COA Priority Ranking: 3

COA Priority Ranking Reason: Enable coalition space-based missile warning capability.

COA Descriptions

COA Name: Absence of laser dazzling

COA Overall Concept: Prevent employment of Orgonian capability to interfere with medium altitude and/or geosynchronous earth orbit infrared sensors.

COA Specific Definition: The degree of dominance in space of one force over another that permits the conduct of operations by the former and its related land, maritime, air, space, and special operations forces at a given time and place without prohibitive interference by the opposing force. (JP 1-02.)

COA Purpose: Protect space-based communication

Course of Action Details

COA Restrictions

COA Laws of Armed Conflict: "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies" (1967 Outer Space Treaty).

COA Overall Acceptability: Medium

COA Diplomatic Concerns: High

COA Coalition Concerns: Medium

COA Other Limitations: World public opinion with use of space weapons.

General Comments on Restrictions: Adversary must first use space weapons before Allied governments will agree to Allied employment of countering space weapons.

Rules of Engagement

COA Rules of Engagement for Air: No direct attacks on space-related terrestrial targets.

COA Rules of Engagement for Land: [Empty]

Instances Table

Instance	Property	Value
AbsenceLaserDazzling-Space	rdfs:comment	Absence of laser dazzling.
AbsenceNavigationJamming-Space	RecordWBS	CA.SI.5.1.1.4.1.1.1
AbsenceSelectedMilitaryISR-Space	RecordWBS	CA.SI.5.1.1.1.1.1.4
AbsenceSelectedMilitarySatelliteSignals-Space	RecordWBS	CA.SI.5.1.1.8.2.1.1
AbsenceSelectedMilitaryWeather-Space	RecordWBS	CA.SI.5.1.1.7.1.1.1
AbsenceSelectedSpaceAccessFacilities-Space	RecordWBS	CA.SI.5.1.1.9.1.1.1
GPSAidedMunitionsBombingAccuracyConsistent-Space	RecordWBS	CA.SI.5.1.1.10.1.1.1
GPSorGLONASSNavigationLackUsableSignalBy-Space	RecordWBS	CA.SI.5.1.1.1.1.1.3
NoCommercialSourceSellsAdversaryISRData-Space	RecordWBS	CA.SI.5.1.1.6.1.1.1
NoDegradationLEOSatellitesFromOrgonianLasers-Space	RecordWBS	CA.SI.5.1.1.8.2.1.3
NoMessageActivityFromTFDtoFWBrinadeVia-Space	RecordWBS	CA.SI.5.1.1.3.1.1.1
NoMessageActivityFromTFDtoFWBrinadeVia-Space	RecordWBS	CA.SI.5.1.1.1.1.1.1

SSA Requirements Study

- **Reviewed Doctrine Docs, Joint Pubs, Air Force Glossaries, Air Force Instructions, Air Force Pamphlets, Army Field Manuals, National Defense University Handbook, and Multiservice Procedures**
 - **55 Total Documents Analyzed**
- **Terrestrial Intelligence Preparation of the Battlespace (IPB) Principles Extrapolated to Space**
 - **~1,900 Different Space Control / SSA Requirements**

SSA-T Baselines Space Control/SSA Requirements From Fundamental Military Doctrine

Example SSA Requirements Matrix

⋮

Is the weapon system preparing/powering up for use?

INTEL Derived From	INTEL Requirements	INTEL Indicators	Resolution Requirements	Space NIIRS	Detection Means	Technologies
Basic Characterization	Satellite Current Orientation Attitude	Satellite Current Cross Section	1.2 - 2.5	4	Imagery or RADAR	Optical or RADAR
Basic Characterization	Satellite Has Changed Attitude From Spinning or 3-Axis Stability	Satellite Cross Section Change	2.5 - 4.5	3	Optical or RADAR Cross Section	Optical or RADAR
Detailed Characterization	Satellite Current Weapons Suite Pointing Direction	Satellite Weapons Suite Image	0.20 - 0.40	7	Imagery	Optical
Exquisite Characterization	Satellite Delta-V Remaining Capability	Satellite Telemetry Indicates Propulsion Tank Fluid Level	N/A	N/A	RF Signal Monitoring	RF Receivers
		Satellite Propulsion Tank Thermal Image	0.20 - 0.40	7	Imagery	Optical-IR
Exquisite Characterization	Satellite Propulsion Tank Fluid Status	Satellite Telemetry Indicates Propulsion Tank Fluid Status	N/A	N/A	RF Signal Monitoring	RF Receivers
		Satellite Propulsion Tank Thermal Image	0.20 - 0.40	7	Imagery	Optical-IR
Exquisite Characterization	Satellite Current On-Board Processor State	Satellite Telemetry Indicates On-Board Processor State	N/A	N/A	RF Signal Monitoring	RF Receivers
Exquisite Characterization	Satellite Propulsion Tank Internal Pressure	Satellite Telemetry Indicates Propulsion Tank Internal Pressure	N/A	N/A	RF Signal Monitoring	RF Receivers
Detailed Characterization	Satellite Current Detailed Thermal Signature	Satellite Thermal Image	0.20 - 0.40	7	Imagery	Optical-IR

⋮

← 1,900 Other SSA Requirements

SSA Requirements Linked to Sensor Resolutions

NIIRS Space Equivalents Defined

NIIRS Rating	GRD (m)	Terrestrial Examples	Space Equivalent Examples
0		Interpretability of the imagery is precluded by obscuration, degradation, or very poor resolution	Satellite features in shadow
1	9	Detect the presence of aircraft dispersal parking areas.	Characterize very large (e.g., International Space Station) space object.
2	4.5 - 9.0	Detect the presence of large (e.g., Boeing 737, 747, Airbus A-300, MD-80) aircraft.	Characterize large (e.g., GEO Communications satellite) space object.
3	2.5 - 4.5	Detect medium-sized aircraft (e.g., F-15). Identify an ORBITA site on the basis of a 12 meter dish antenna normally mounted on a circular building.	Characterize medium (e.g., DMSP) space object.
4	1.2 - 2.5	Identify the wing configuration of small fighter aircraft (e.g., F-16). Detect large (e.g., greater than 10 meter diameter) environmental domes at an electronics facility.	Detect if large (e.g., TDRS) solar panel has deployed.
5	0.75 - 1.2	Distinguish between single-tail (e.g., F-16) and twin-tailed (e.g., F-15) fighters. Detect automobile in a parking lot. Identify the metal lattice structure of large (e.g. approximately 75 meter) radio relay towers.	Determine large (e.g., TDRS) solar panel design configuration. Determine satellite attitude/spin rate. Determine if satellite has broken up into large pieces.
6	0.40 - 0.75	Detect wing-mounted stores (i.e., ASM, bombs) protruding from the wings of large bombers (e.g., B-52). Identify the spare tire on a medium-sized truck.	Determine existence of medium-sized (TDRS SGL Antenna) satellite antennas.
7	0.20 - 0.40	Identify antenna dishes (less than 3 meters in diameter) on a radio relay tower. Identify individual 55-gallon drums. Detect small marine mammals (e.g., harbor seals) on sand/gravel beaches. Identify ports, ladders, vents on electronics vans. Identify ind	Determine attitude of medium-sized (TDRS SGL Antenna) satellite antennas. Determine large area degradation of solar panel optical quality.
8	0.10 - 0.20	Identify the rivet lines on bomber aircraft. Detect horn-shaped and W-shaped antennas mounted atop BACKTRAP and BACKNET radars. Identify windshield wipers on a vehicle. Identify limbs (e.g., arms, legs) on an individual. Identify individual horizontal and	Determine medium-sized (TDRS SGL Antenna) satellite antenna damage.
9	<0.10	Identify screws and bolts on missile components. Detect individual spikes in railroad ties. Identify individual rungs on bulkhead mounted ladders. Identify vehicle registration numbers (VRN) on trucks.	Detect orbital thruster damage. Detect if optical covers have been removed.

Similar to AFRL SORS (Space Object Rating Scale)

NIIRS = National Imagery Interpretability Rating Scale

Space NIIRS Based on Equivalent Terrestrial NIIRS Definitions



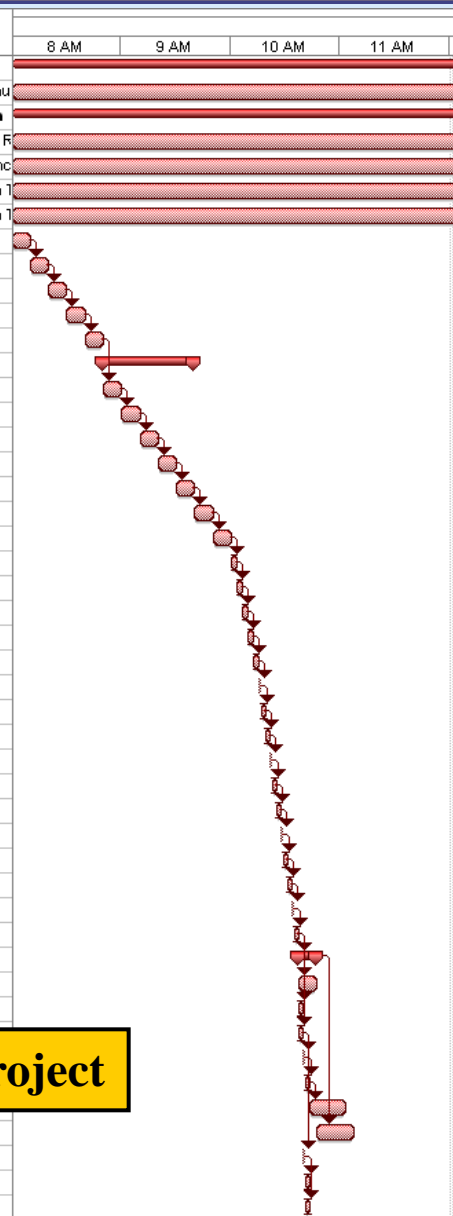
SSA-T Automatic Space Object Classification

- **Unknown Space Object Characteristics Compared to Selected Space Objects In Databases**
- **98% of the Time the Correct Mission for the Unknown Object is Within the Top 3 Choices SSA-T Automatically Makes**
- **SSA-T Has Corrected USSPACECOM Satellite Catalog Mistakes In Mission Assessments**

SSA-T Helps the Satellite Analyst In Determining Surveillance Tasking Priorities

Scenario Partial Example 1

Weapon	INTEL Type 1	INTEL Type 2	WBS Code	Name
Mobile Direct Ascent ASAT	IMIHT	SIGIHT	8	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Launch Situation
Mobile Direct Ascent ASAT	IMINT	SIGINT	8.1	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Launch Profile Does Not Look Like IRBM Surface-to-Surface Lau
Mobile Direct Ascent ASAT	MASIHT		8.2	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - No Detrimental Weather Conditions for Launch
Mobile Direct Ascent ASAT	MASINT		8.2.1	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - No Detrimental Weather Conditions for Launch - No Heavy R
Mobile Direct Ascent ASAT	MASINT		8.2.2	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - No Detrimental Weather Conditions for Launch - Low Chanc
Mobile Direct Ascent ASAT	MASINT		8.3	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Newmanian Satellite Approaching from Over the Horizon Within T
Mobile Direct Ascent ASAT	MASINT		8.4	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Newmanian Satellite Approaching from Over the Horizon Within T
Mobile Direct Ascent ASAT	IMINT		8.5	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - TEL Removed from Shelter / Camouflage
Mobile Direct Ascent ASAT	IMINT		8.6	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Vehicle Chucks / Levelers / Stabilizers Extended
Mobile Direct Ascent ASAT	IMINT		8.7	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Seals Removed
Mobile Direct Ascent ASAT	IMINT		8.8	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - TEL Erects Missile
Mobile Direct Ascent ASAT	IMINT		8.9	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - TEL Moves Away from Missile
Mobile Direct Ascent ASAT	ELIHT	COMIHT	8.10	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Final Checks & Tests
Mobile Direct Ascent ASAT	ELINT	COMINT	8.10.1	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Test Missile Sub-Systems
Mobile Direct Ascent ASAT	ELINT		8.10.2	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Test Launch Control Vehicle to Missile COMM
Mobile Direct Ascent ASAT	COMINT		8.10.3	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Test Space Center to Launch Control Vehicle COMM
Mobile Direct Ascent ASAT	COMINT		8.10.4	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Test Command Center to Space Center COMM
Mobile Direct Ascent ASAT	IMINT	SIGINT	8.10.5	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Launch Rehearsal
Mobile Direct Ascent ASAT	FISINT	TELINT	8.11	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Calibrate Inertial Guidance System
Mobile Direct Ascent ASAT	COMINT		8.12	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Receive Final Target Orbital Elements
Mobile Direct Ascent ASAT	FISINT	TELINT	8.13	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Upload Final Target Orbital Elements
Mobile Direct Ascent ASAT	IMINT	MASINT	8.14	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Top-Off Seeker Coolant
Mobile Direct Ascent ASAT	FISINT	TELINT	8.15	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Arm Batteries
Mobile Direct Ascent ASAT	IMINT	FISINT	8.16	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Hard-Point Attachments Released
Mobile Direct Ascent ASAT	FISINT	TELINT	8.17	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Booster Separation Squibs Armed
Mobile Direct Ascent ASAT	HUMINT	COMINT	8.18	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Countdown Sequence Initiated
Mobile Direct Ascent ASAT	FISINT	TELINT	8.19	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Functions Transferred to Internal Power
Mobile Direct Ascent ASAT	COMINT	HUMINT	8.20	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Authenticated Launch Codes Received
Mobile Direct Ascent ASAT	ELINT	HUMINT	8.21	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Officer Selects Missile from Battery
Mobile Direct Ascent ASAT	ELINT	HUMINT	8.22	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Officer Inserts Key Into Launch Control Console
Mobile Direct Ascent ASAT	ELINT	HUMINT	8.23	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Officer Lifts Cover from Launch Switch
Mobile Direct Ascent ASAT	ELINT	HUMINT	8.24	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Officer Operates Launch Switch
Mobile Direct Ascent ASAT	IMINT	MASINT	8.25	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Engine Started
Mobile Direct Ascent ASAT	FISINT	TELINT	8.26	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Begin Thrust Chamber Pressure Buildup
Mobile Direct Ascent ASAT	IMINT	MASINT	8.27	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Hold-Down-Bolts Fired
Mobile Direct Ascent ASAT	IMINT	MASINT	8.28	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Umbilicals Released
Mobile Direct Ascent ASAT	IMIHT	MASIHT	8.29	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Launch
Mobile Direct Ascent ASAT	IMINT	MASINT	8.29.1	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Launch - Plume Present
Mobile Direct Ascent ASAT	MASINT		8.29.2	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Launch - Loud Auditory Signal
Mobile Direct Ascent ASAT	IMINT	MASINT		
Mobile Direct Ascent ASAT	IMINT	MASINT		
Mobile Direct Ascent ASAT	IMINT	MASINT		
Mobile Direct Ascent ASAT	MASINT			
Mobile Direct Ascent ASAT	FISINT	TELINT	8.33	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Telemetry Data Links Increased Bandwidth
Mobile Direct Ascent ASAT	MASINT		8.34	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile Flies Through Atmosphere
Mobile Direct Ascent ASAT	FISINT	TELINT	8.35	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Site Personnel Staring Up at the Sky
Mobile Direct Ascent ASAT	FISINT	TELINT	8.36	Koronean Tubul Mobile DA ASAT Attack Against Newnianian Goy En LEO Photo Satellite - Missile First Stage Shutdown



Battle in the Blue Scenario Time Lines in Microsoft Project

Scenario Partial Example 2

US Tactical Objective S2-8. Deny North Korea space-based surveillance and reconnaissance information

Purpose: Deny North Korea ability to gather information on coalition forces using space-based assets

Success Criterion:

S2-8.1: North Korea unable to receive space-based surveillance and reconnaissance information

Concept: Increase time and resources required for North Korea to gather information on coalition strength and force disposition

Tactical Tasks:

S2-8.1.1: Prevent North Korea forces from gathering ISR information using indigenous space-based assets

Concept: Eliminate North Korea surveillance and reconnaissance assets affecting the Coalition operations

Success Indicator:

IND: North Korea surveillance and reconnaissance interrupted

IND: Coalition space-based surveillance and reconnaissance capability remains uninterrupted

S 2-8.1.2: Prevent North Korea forces from acquiring third-party/commercial ISR information

Concept: Deny North Korea ability to purchase/obtain ISR data from third-party/Commercial sources

Deny third party capability to image selected protected areas

Success Indicator:

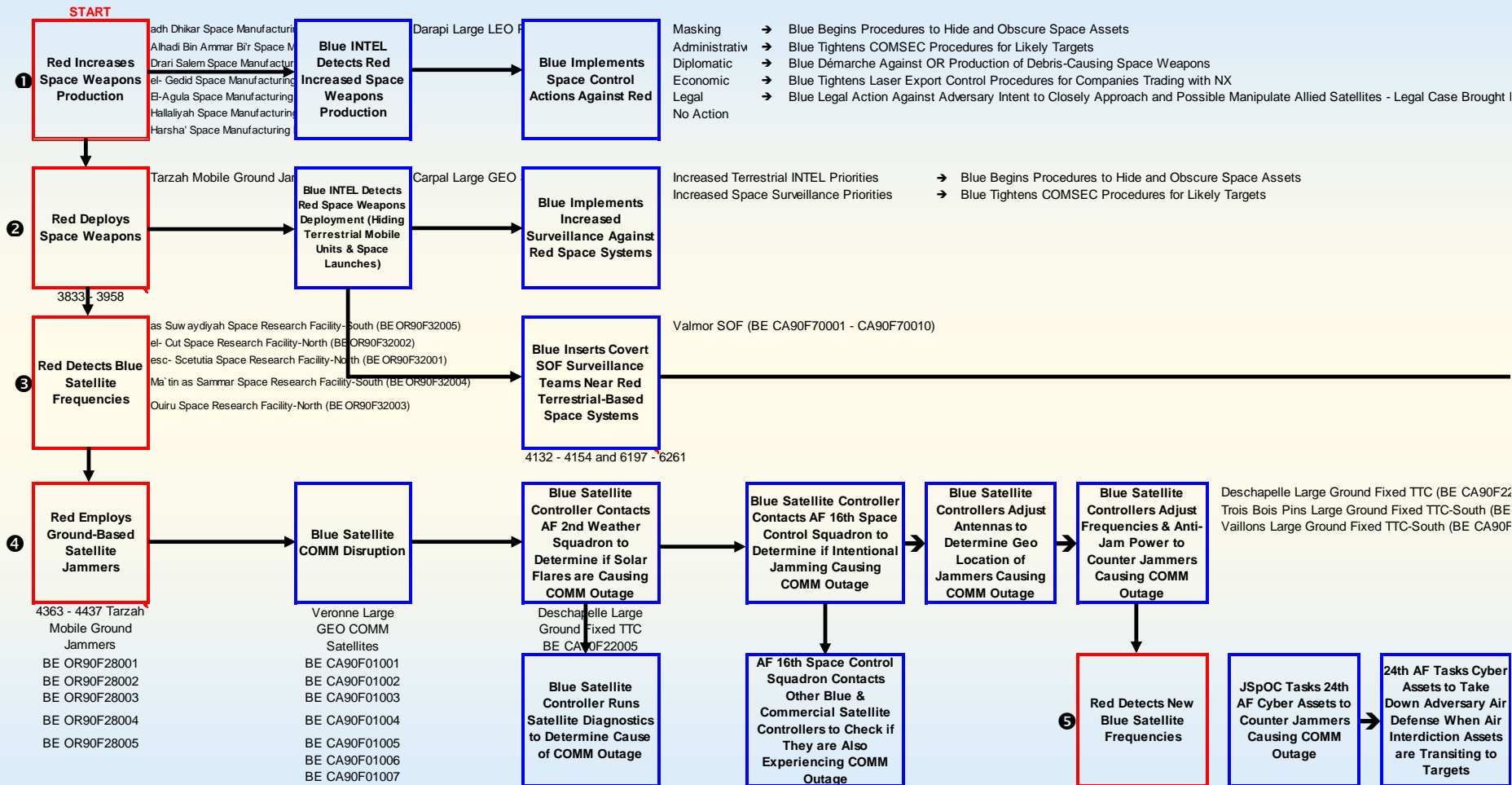
IND: No commercial source sells North Korea ISR data

IND: Third parties unable to pass ISR data to North Korea

IND: Third party unable to collect ISR data over selected protected area

Space Objectives Available Also

Scenario Partial Example 3



Detailed Space Control Scenarios Available for Analyses

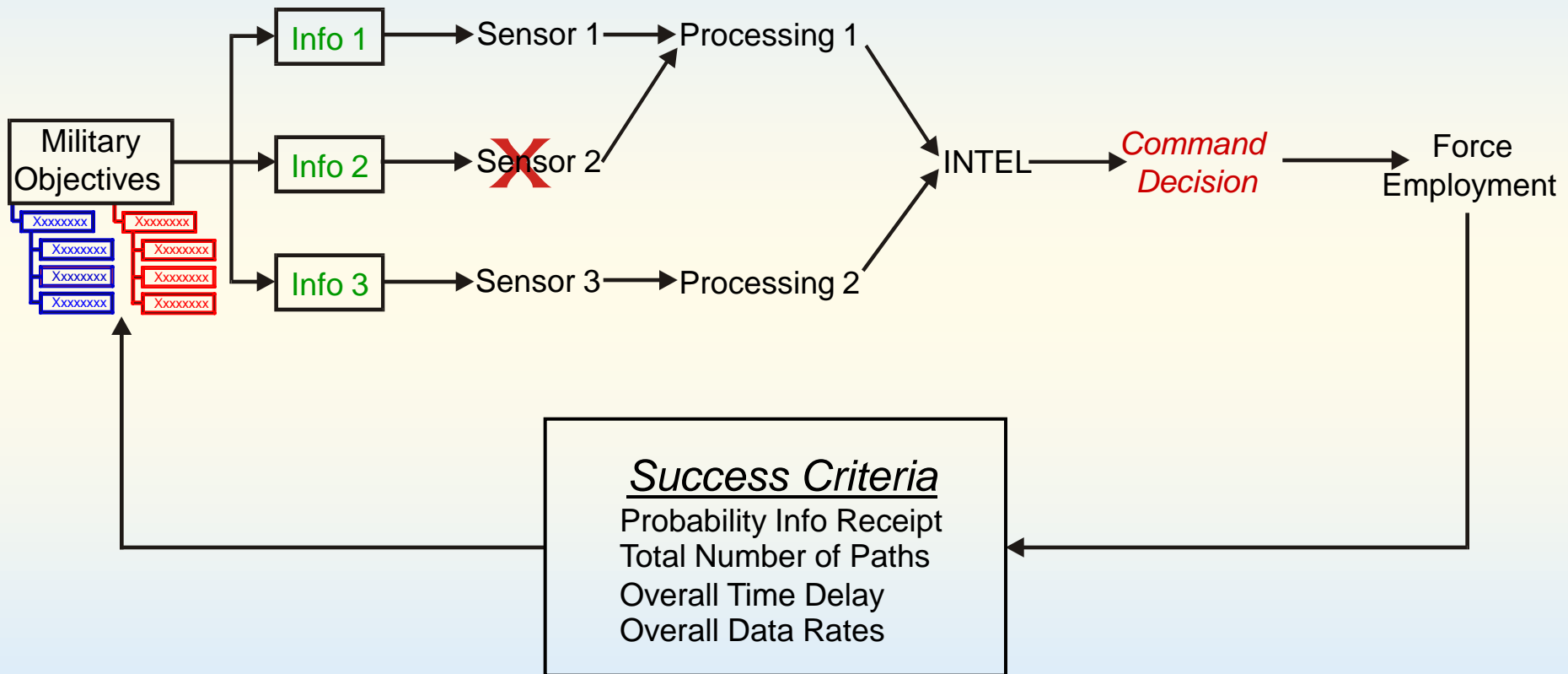
UNCLASSIFIED

Space Info Choke Points Network Analyses

- **SHIVA (Space Highest Information Value Assessment)**
 - **PC-Based In Microsoft Access**
 - **Performs Links & Nodes Network Analysis Showing Value of Information to the Warfighter**
 - **Can Conduct Red Or Blue Targeting/Vulnerability Analyses**
 - **Algorithms & Software Validated by RAND**

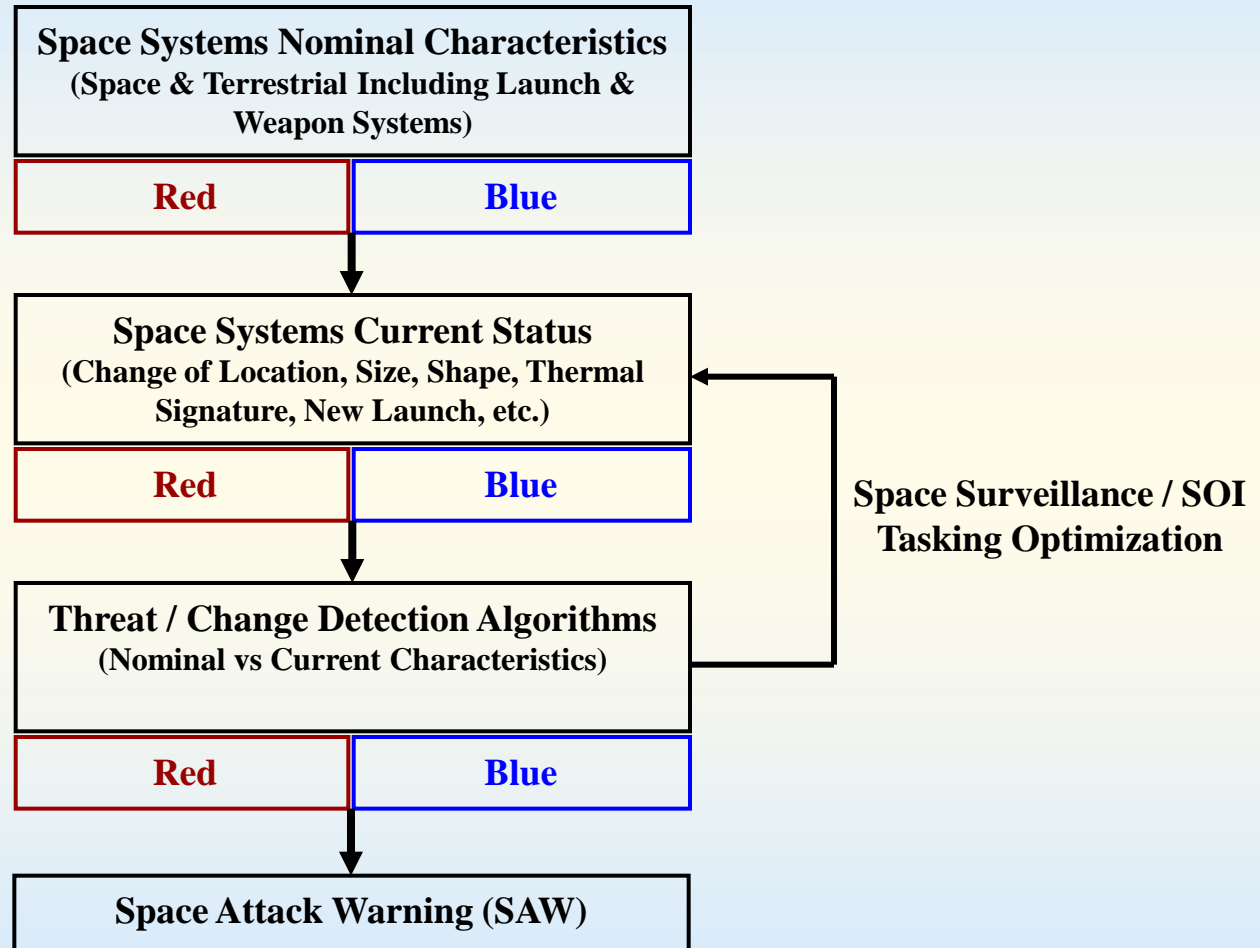
SHIVA Can Show the Value of Space Systems

SHIVA Methodology



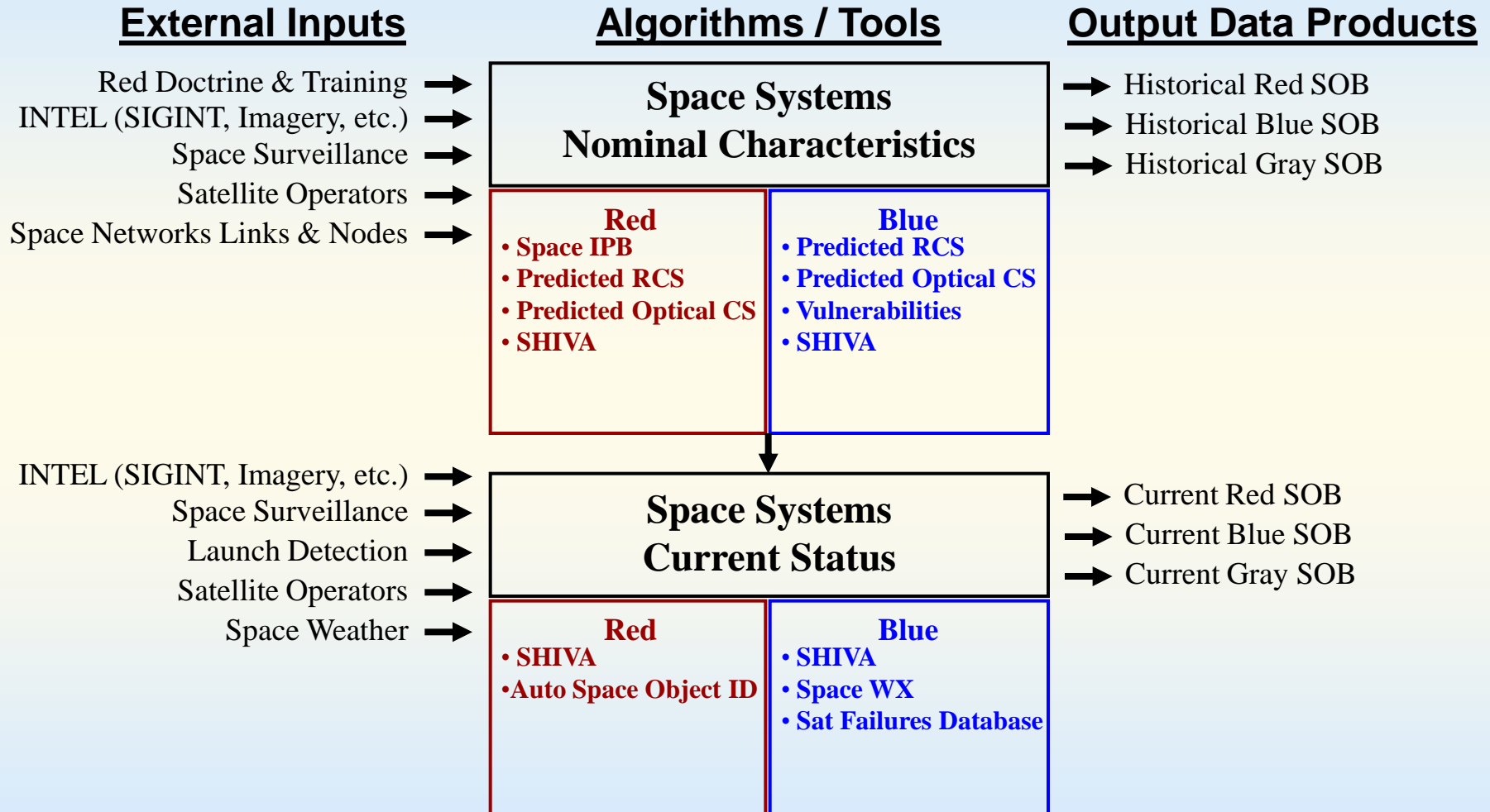
SHIVA Calculates All Possible Paths Between Sensors and Shooters

SSA & SAW Integrated Concept



Predict an Adversary's Intentions & Next Moves Against Space Systems

SSA & SAW Detail 1



Space Characteristics Databases Critical for Attack Detection

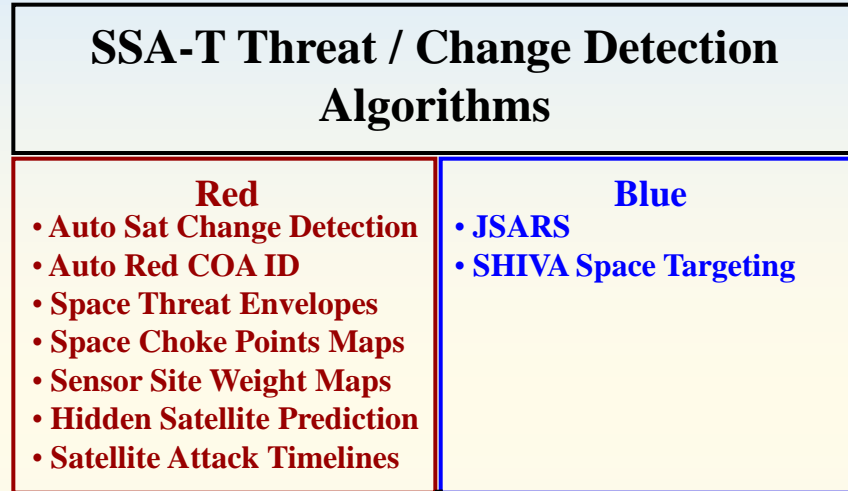
SSA & SAW Detail 2

Internal Inputs

Algorithms / Tools

Output Data Products

Satellite Databases →



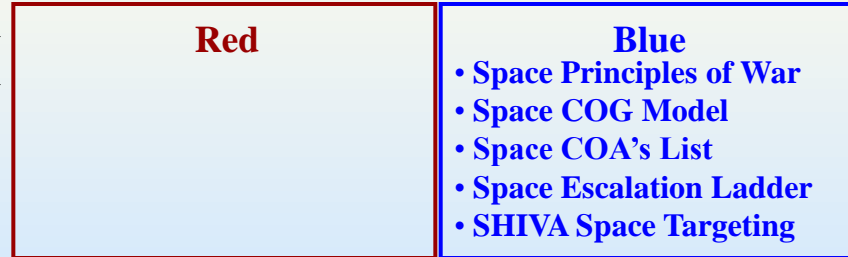
- Most Probable Red COA
- Red Attack Timelines
- Direction of Attack
- Space Object ID & Status
- Most Vulnerable Regions of Orbital Space
- Space Sensor Optimized Tasking

INTEL Indicators vs Red COA's →



- Space Strategies Inputs
- Candidate Red Target List
- Impact on Blue Space

Space Systems Importance →
 Space Weapons Reach →
 Space Systems Vulnerability →



Space Object Change Detection Critical for Attack Warning

Proposed SSA-T Future Developments

- **Evolve Most Threatening Regions of Space Displays (SAW)**
 - Develop Delta-V vs. Transit Time Maps
 - Display Non-RPO Attack Modes (Iridium 33 vs. Cosmos 2251)
 - ✓ **IMPACT: Increased Ability to Predict Space Attacks, & Help Prevent Terrestrial War; Also, Better Optimized Tasking of INTEL Sensors**
- **Expand SSA-T Space Game Developments**
 - Develop Lists of Best Red Space Attack Strategies Assuming Certain Types of Weapon Systems
 - Determine the INTEL Indicators of These Types of Attacks
 - ✓ **IMPACT: Increased Ability to Predict Red Space Intentions, & Help Prevent Terrestrial War; Also, Better Optimized Tasking of INTEL Sensors**
- **Auto Space Missile Launch Identification**
 - Adapt Proven SSA-T State Change Algorithms to Automatically Predict Satellite Launch Times & Missions Using SIGINT Data
 - ✓ **IMPACT: Automated Space Launch Typing Allows Faster Threat Mitigation Timelines Translating to Better War-Winning Space Strategies**

Small Investment Leveraged Into War-Winning Space Control / SSA Battle Management