



***UNITED STATES SPACE COMMAND
AND
NORTH AMERICAN AEROSPACE DEFENSE COMMAND***

***NORAD AND USSPACECOM
JOINT MODELING AND SIMULATION
ACTIVITIES AND ISSUES***

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OVERVIEW

- **MISSION EVOLUTION**
 - **INFORMATION WARFARE**
 - **SPACE CONTROL**
- **ROLES OF MODELING AND SIMULATION**
- **JOINT M&S ACTIVITIES**
- **ISSUES**



MISSION EVOLUTION

- **CURRENT UCP MISSIONS**
 - SPACE CONTROL, FORCE APPLICATION, FORCE ENHANCEMENT, SPACE SUPPORT
- **EVOLVING MISSIONS**
 - SPACE COMBAT, SPACE COMBAT SUPPORT, INFORMATION OPERATIONS
- **HIGHLIGHTS**
 - SPACE CONTROL RECOGNIZED AS AN ESSENTIAL MISSION AREA AND ACTIVITIES MANDATED BY CONGRESS
 - COMPUTER NETWORK DEFENSE RESPONSIBILITIES TO BE ACTIVATED IN OCT 99
- **DIRECTORATE OF ANALYSIS ROLES**
 - **EMPHASIS ON INTEGRATING CAPABILITIES OF THE COMPONENT COMMANDS**
 - NOT THE CLEAR DISTINCTION AMONG LAND, SEA, AIR THAT EXISTS FOR OTHER COMBATANT COMMANDS.
 - **COURSES OF ACTION INCLUDE MITIGATING ANOMALIES IN SATELLITE CONSTELLATIONS**



JOINT M&S ACTIVITIES

- **JOINT MODELING AND SIMULATION EXECUTIVE PANEL**
- **JWARS USERS' AND REQUIREMENTS GROUPS**
- **IMPLEMENTATION OF DODI 5000.59 AND CJCSI 8510.01**
- **COLLABORATIVE ANALYSIS AMONG COMBATANT COMMANDS AND WITH COMPONENTS**
- **INTERFACE WITH THE TECHNICAL, ANALYTICAL, AND SCIENTIFIC COMMUNITIES**

ROLE OF M&S IN USSPACECOM



- ***SUPPORT FOR CURRENT SPACE OPERATIONS***
 - SPACE SURVEILLANCE
 - SATELLITE CONTROL
 - MISSION CAPABILITY PREDICTIONS
- ***ASSURANCE THAT REQUIREMENTS ARE FEASIBLE AND EFFECTIVE***
 - CONSTELLATION ARCHITECTURES, COVERAGE/REVISIT, AND C2 ANALYSES
- ***DEMONSTRATING THAT ALLOCATED FORCES ARE SUFFICIENT (OR NOT)***
- ***COMMAND, CONTROL, AND COMMUNICATIONS ANALYSES***
 - DETAILED MODELS OF COMBINED SPACE AND TERRESTRIAL NETWORKS
 - DETAILED MODELS OF STRATEGIC WARNING AND DEFENSE
- ***EXTENSIVE M&S OF THEATER MISSILE WARNING AND DEFENSE***



USSPACECOM M&S APPLICATIONS AND ADVANCES

- **OPERATIONAL FRAMEWORK TO GUIDE M&S**
- **COLLABORATION WITH DISA**
- **COLLABORATION WITH THE NRO**



APPROACH TO INCORPORATING SPACE INTO JWARS, JSIMS, AND THE QDR

- **INTERACTIONS BETWEEN SPACE AND TERRESTRIAL SYSTEMS WELL REPRESENTED IN OPORD 3500-XX AND SUPPORTING FRAGMENTARY ORDERS**
- **PARTICIPATION IN DEVELOPING USE CASES FOR JWARS BETA RELEASE WOULD HELP TEST AND ESTABLISH LINKAGES**
- **COLLABORATION WITH DESIGNATED TEST SITES TO ESTABLISH ROE FOR AUGMENTING JWARS WITH SUPPORTING MODELS AND SUBJECT MATTER EXPERTISE.**



ROLE OF M&S IN NORAD

- **FORCE STRUCTURE ARCHITECTURES AND COURSES OF ACTION**
- **UNKNOWN TRACK ANALYSIS AND DATA BASES**
- **SENSOR COVERAGE AND EFFECTIVENESS**
- **COMMAND, CONTROL, AND COMMUNICATIONS ASSESSMENTS**
- **BALLISTIC MISSILE WARNING AND DEFENSE ANALYSES**
- **COLLABORATIVE STUDIES WITH CANADA**
 - **CANADIAN SPACE STUDY**



NORAD M&S APPLICATIONS AND ADVANCES

- **ALTERNATIVE SURVEILLANCE ARCHITECTURES**
- **NATIONAL MISSILE DEFENSE KILL ASSESSMENT**



NORAD AND USSPACECOM M&S NEEDS

- **LINKS WITH CAMPAIGN MODELS**
- **OPERATIONAL PROCESS REPRESENTATIONS**
- **RESOURCES**



ISSUES

- **CLASSIFICATION**
 - **SOME VERY COMPETENT MODELS NOT GENERALLY ACCESSIBLE**
- **FUNDING, ROLES, AND MISSIONS**
 - **SERVICE MODELS MUST REFLECT SERVICE BIASES AND INTERESTS**
 - **DIFFICULT TO REPRESENT OTHER SERVICES' CAPABILITIES OBJECTIVELY**
 - **JWARS SCHEDULE AND FUNDING LIMITATIONS PRECLUDE ADDITIONAL "THREADS" AND REPRESENTING ADDITIONAL SYSTEMS**
- **ENDURING EXPERTISE**
 - **DECLINING ANALYTICAL CAPABILITY AMONG THE UNIFIED COMMANDS**