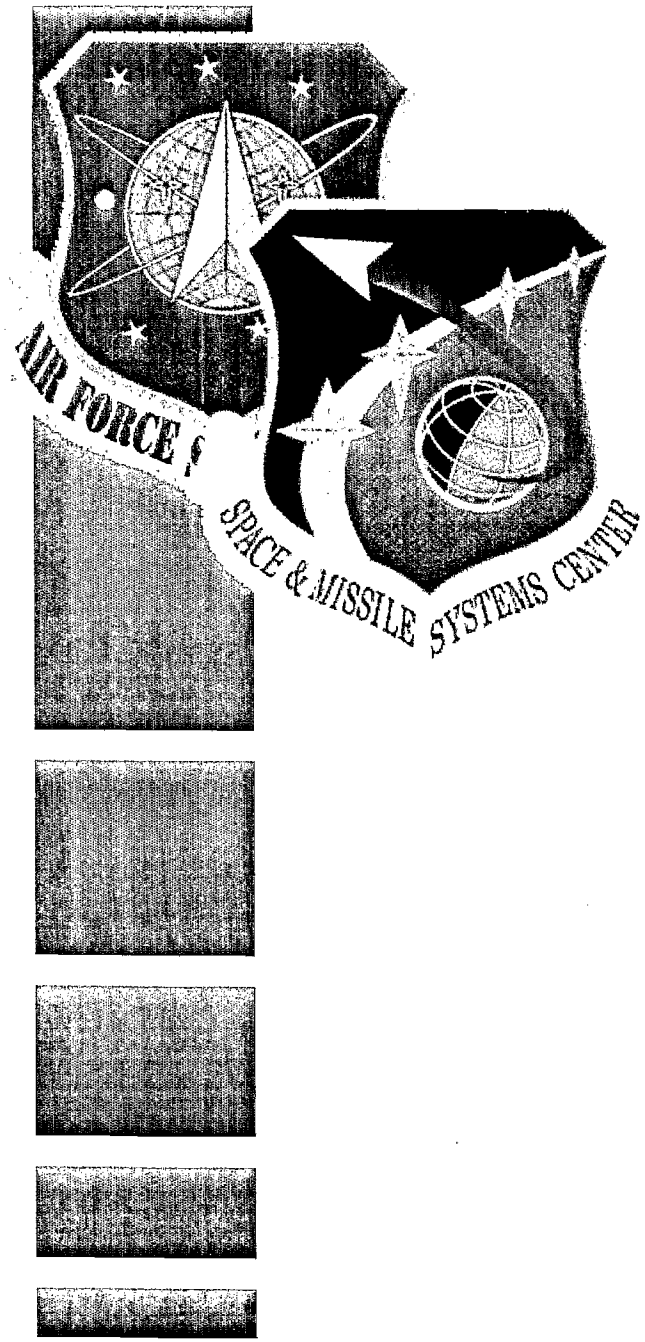


SBIRS Transformational Capability

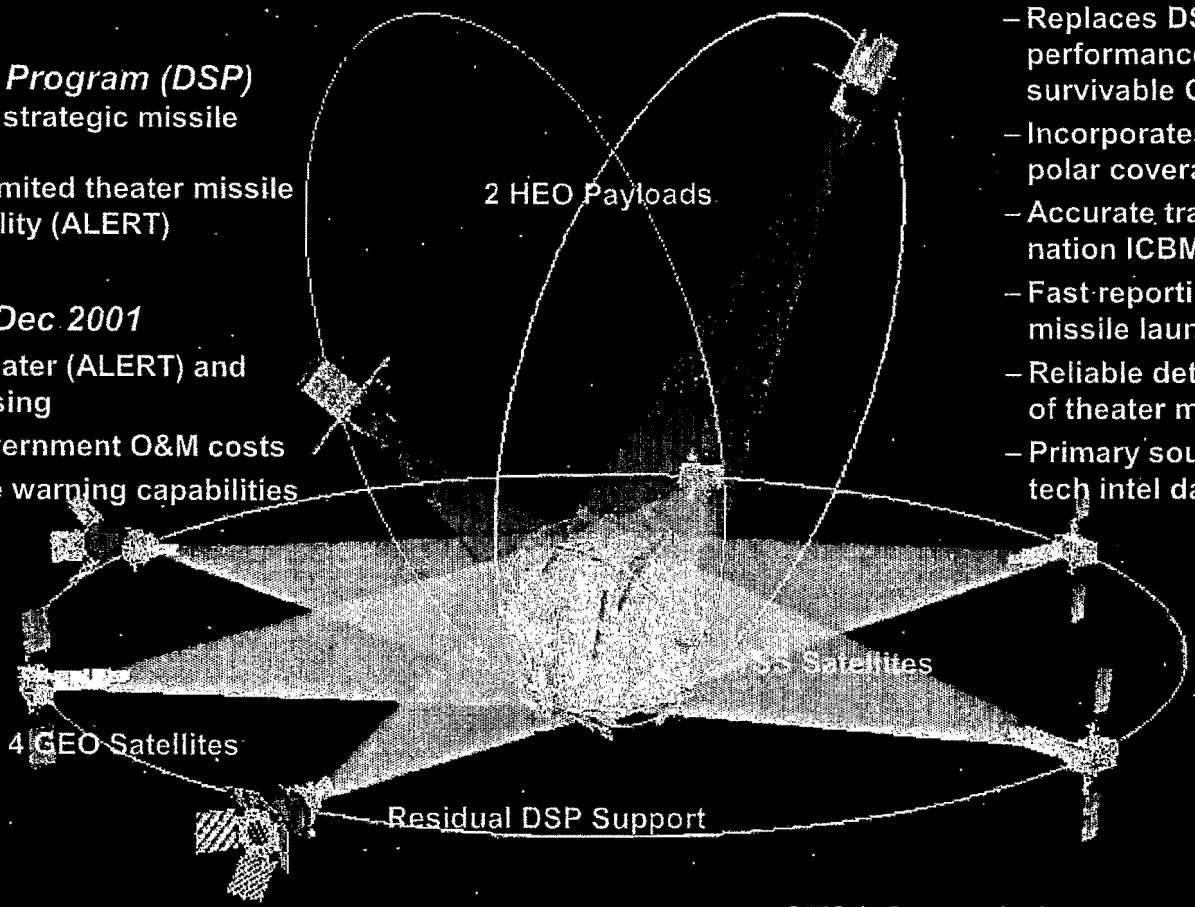
Col Roger Teague
Commander, Space Group
Space Based Infrared Systems Wing
Space and Missile Systems Center (SMC)
30 November 2006

SBIRS Architecture Description

Defense Support Program (DSP)
- Early warning of strategic missile launches
- Exploitation of limited theater missile detection capability (ALERT)

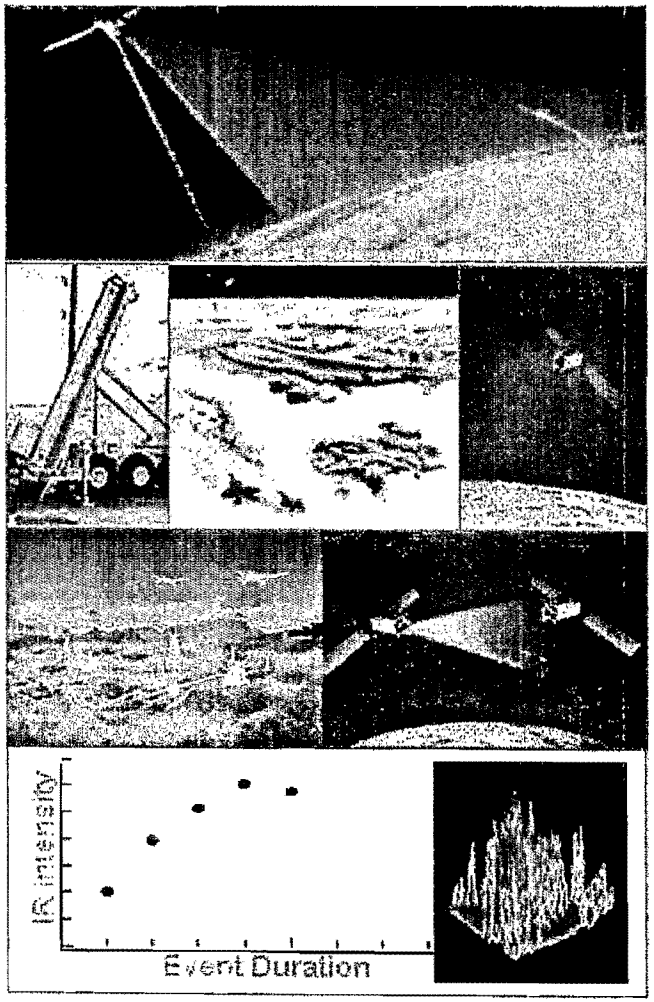
Increment 1 IOC Dec 2001
- Consolidated theater (ALERT) and strategic processing
- Reduction in government O&M costs
- Improved missile warning capabilities

Increment 2
- Replaces DSP with higher performance, longer lasting & survivable GEO satellites
- Incorporates high-availability polar coverage via HEO sensors
- Accurate tracking of rogue nation ICBM launches
- Fast reporting of strategic missile launches
- Reliable detection and tracking of theater missiles
- Primary source of high-quality tech intel data



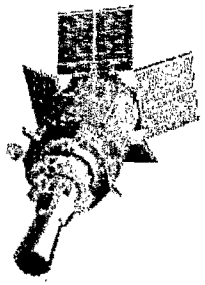
STSS formerly Increment 3 (SBIRS Low)
- Midcourse tracking and discrimination of NMD and TMD threats
- Guaranteed detection of NMD threats
- Space surveillance
- Weather Support

SBIRS Mission Capabilities



- **Missile Warning: provide timely warning of strategic and theater ballistic missile attacks**
  - **Launch origin, missile typing, trajectory, impact point**
- **Missile Defense: detect track and cue missile defense systems**
  - **Provides greater missile detection/tracking and hand-off to radar tracking and kill vehicle systems**
  - **Supports launcher detection, target discrimination and target hit/kill assessments**
- **Technical Intelligence: provide data to technical intelligence analysts**
  - **Multi-mode sensors to detect/collect on evolving threats**
  - **Characterize missiles and other IR events/signatures/phenomenology**
- **Battlespace Awareness: provide an "IR view" of the battlefield to the warfighter**
  - **Provide situational awareness/targeting/assessment for command, control, and execution of joint operations**

Space Based Infrared Systems (SBIRS)



DSP

Evolutionary Improvement

SBIRS

Capabilities

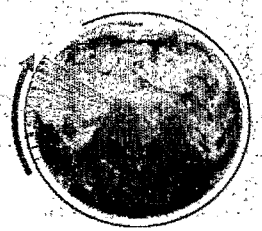
- Missile Warning (with a Classified Probability of Detection) for North America
- Detection and Reporting of Strategic and Theater Ballistic Missiles and Other Infrared Events of Interest

MISSIONS	DSP	SBIRS
MISSILE WARNING	X	X
MISSILE DEFENSE	o	X
TECHNICAL INTEL	o	X
BATTLESPACE AWARENESS	o	X

X – Primary Mission
o – Offers Inherent Capability

- DSP Successor
- Higher Sensitivity—Sees Dimmer Objects, More Often
- Taskable Sensor—Can Do Many Missions at Once
- More Accurate Estimate of Missile Location—Including Launch Point and Impact Point

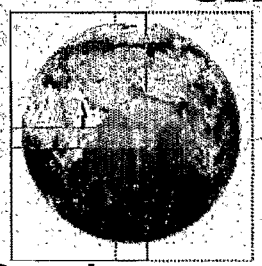
DSP



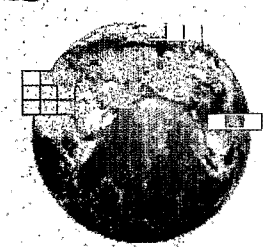
Sweeps earth disk

Revolutionary Capability

SBIRS



Scanning sensor rapidly revisits earth disk

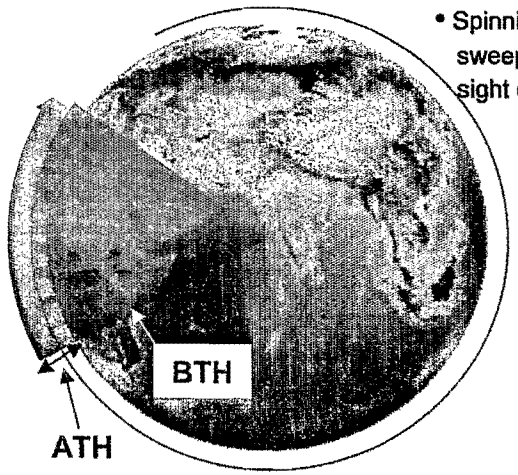


Staring sensor tasked to theater & special areas

SBIRS Sensor Coverage Comparison

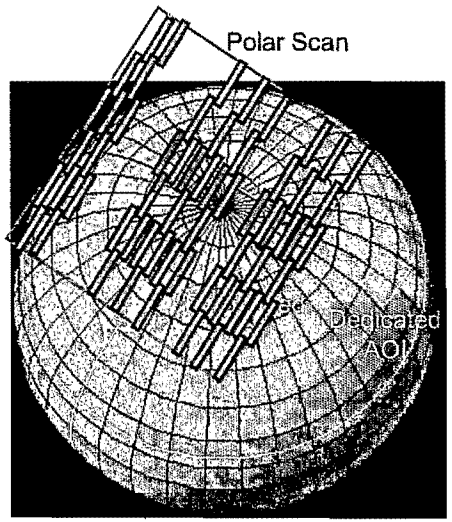
DSP

- Spinning spacecraft sweeps sensor line of sight over Earth disk



SBIRS HEO Scanner

- Sweeps over Polar region/AOI
  - Embedded or Dedicated AOI
- Or Dedicated AOI off polar region
- Scanning via telescope gimbal
- 6 SWIR SCAs, 1 MWIR 1 STG



AOI – Area of Interest

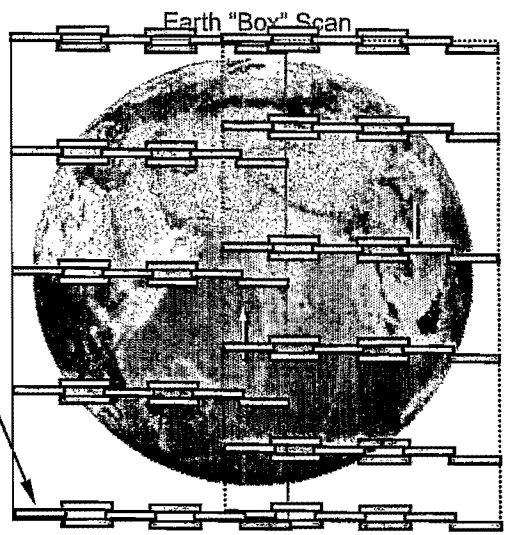
SWIR – Short Wave IR

MWIR – Medium wave IR

STG – See To Ground

SBIRS GEO Scanner

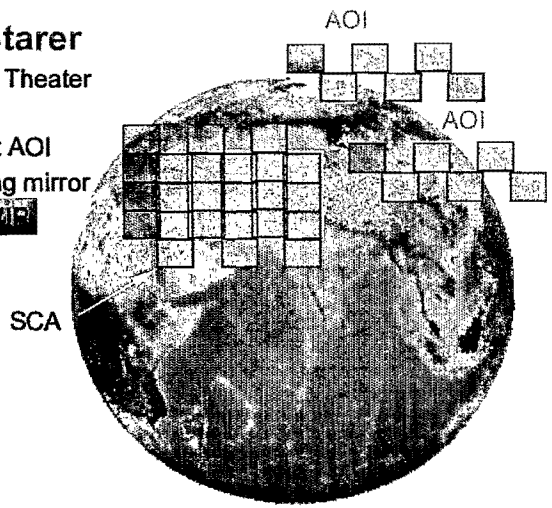
- "Box" scan over Earth disk
- Scanning via pointing mirror
- 6 SWIR SCAs, 1 MWIR 1 STG



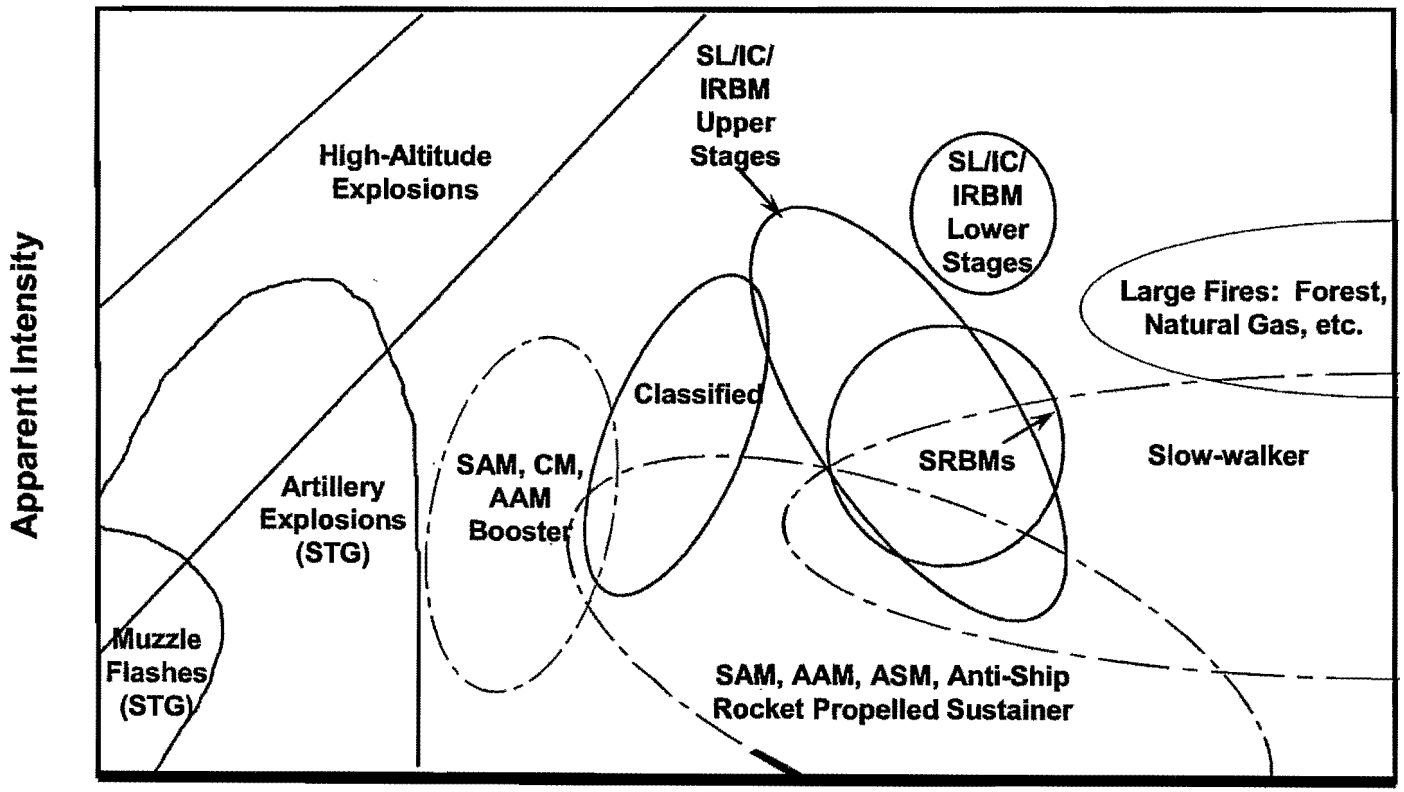
Notes:
ATH: Above the Horizon
BTH: Below the Horizon
SCA: Sensor Chip Assembly

SBIRS GEO Starer

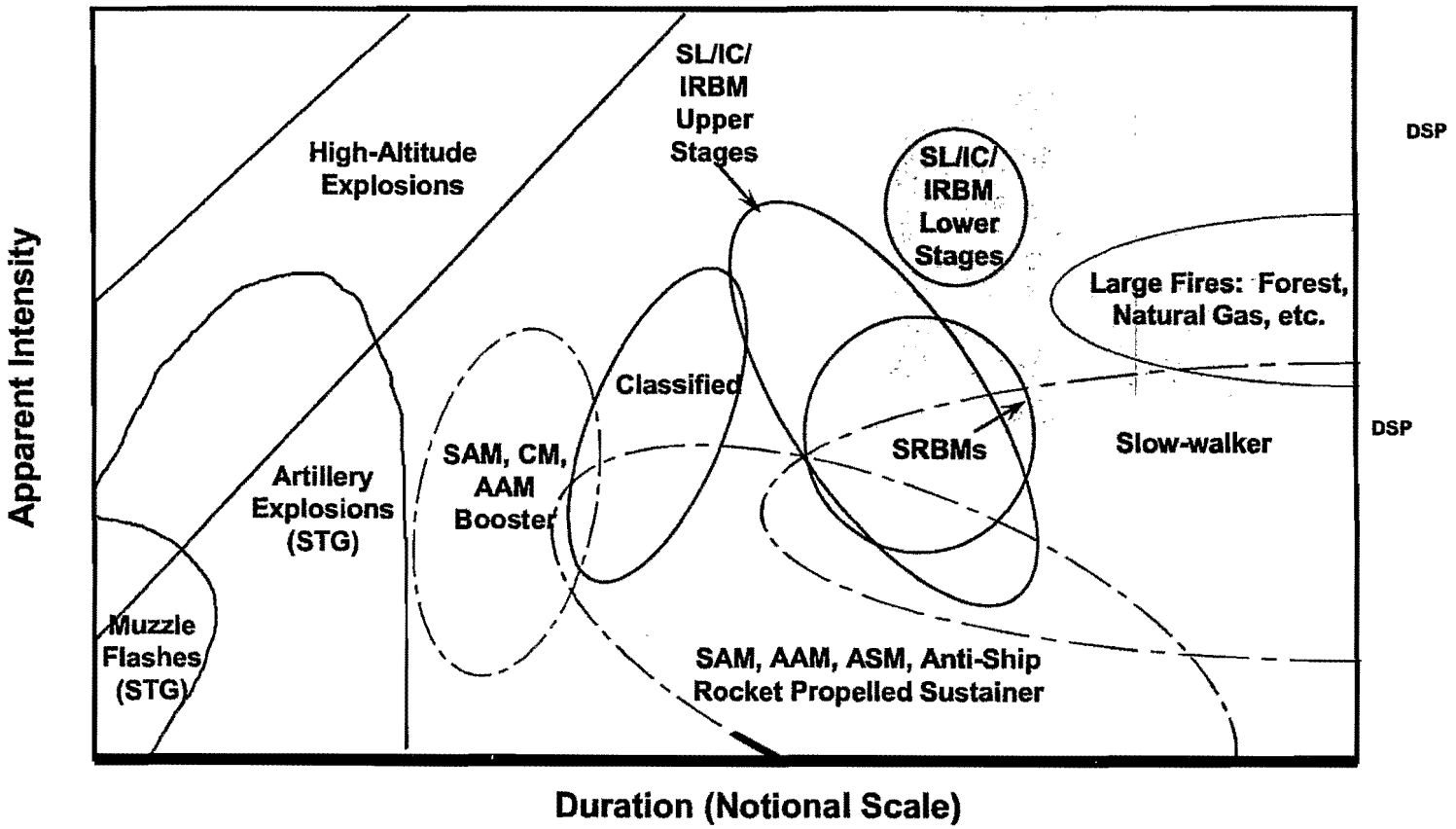
- Agile step-stare over Theater and AOIs
- Or dedicated stare at AOI
- Step-stare via pointing mirror
- 4 SWIR SCAs, 1 MWIR 1 STG



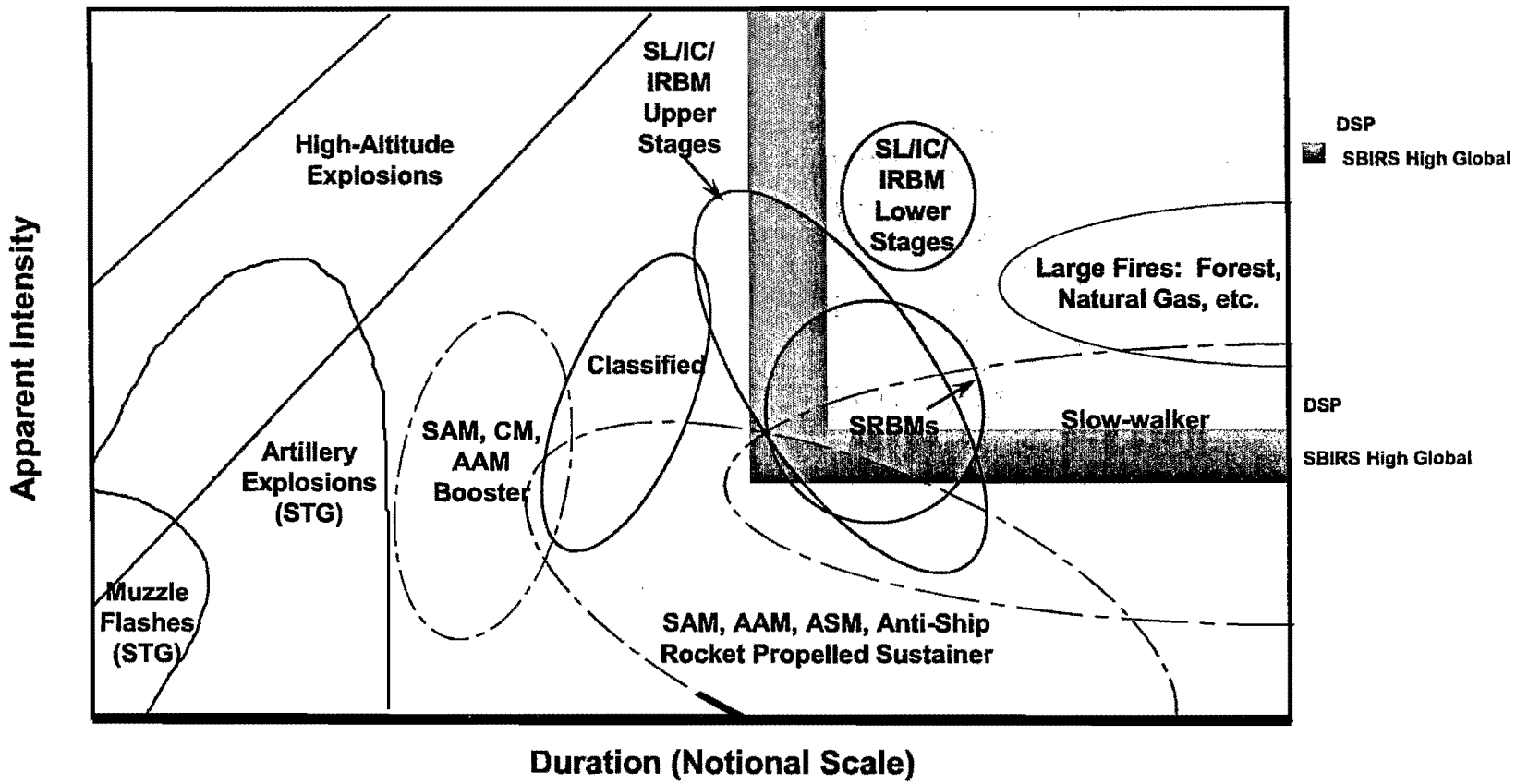
Representative SWIR & STG Intensity and Duration of IR Events



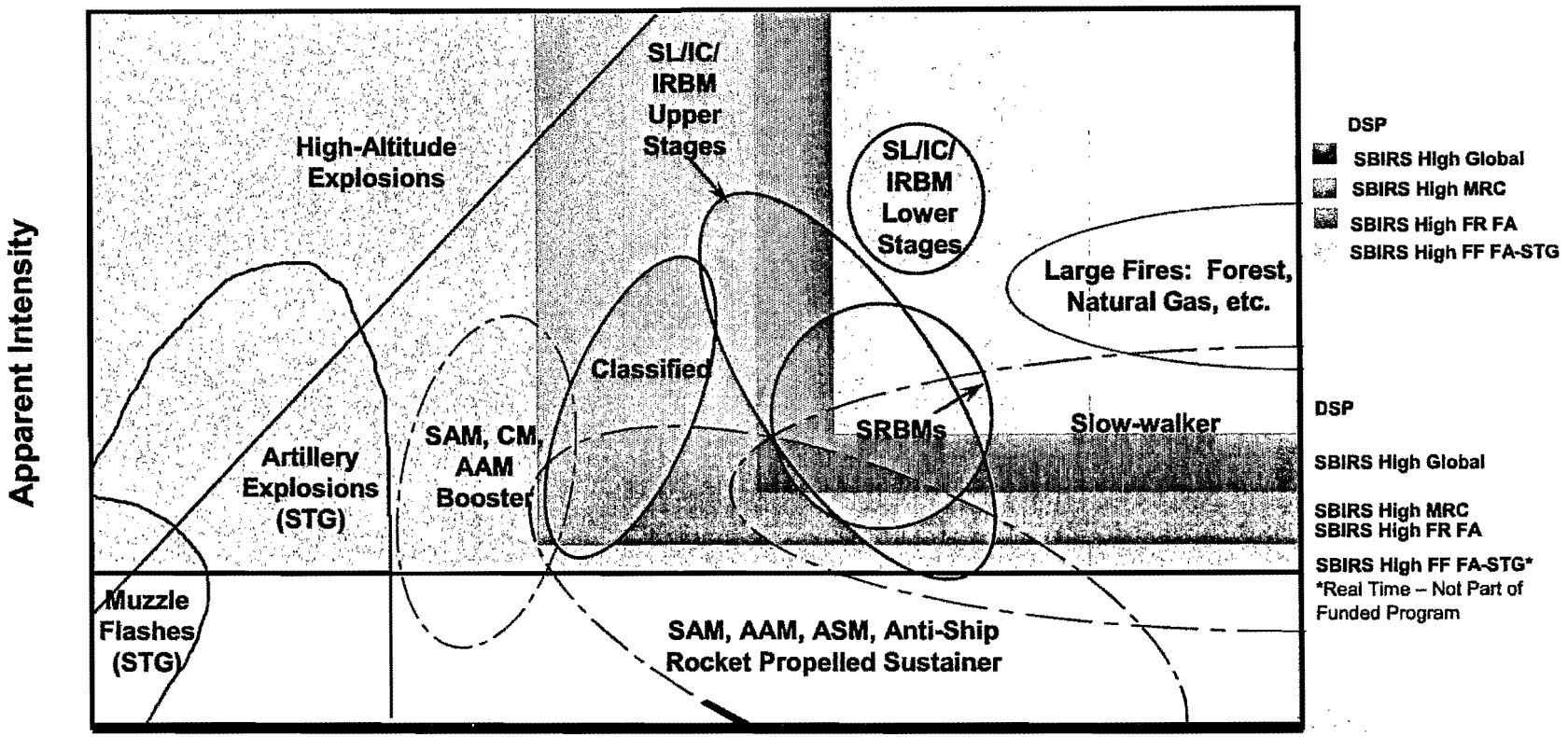
Representative SWIR & STG Intensity and Duration of IR Events



Representative SWIR & STG Intensity and Duration of IR Events



Representative SWIR & STG Intensity and Duration of IR Events



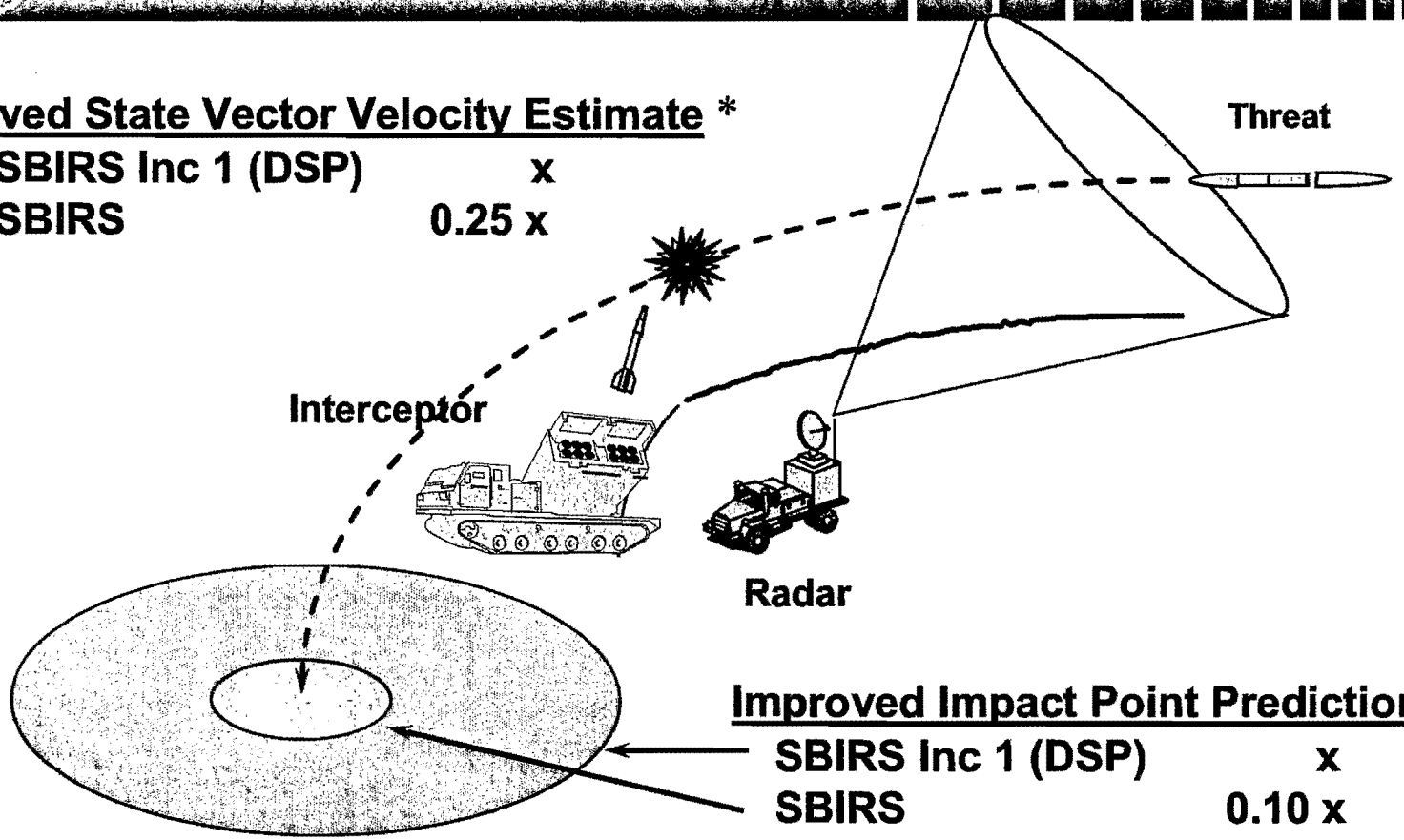
SBIRS High Starer Modes **Duration (Notional Scale)**

- **Step-Stare - Theater Major Regional Conflict (MRC)**
- **Step-Stare - TI Fast Revisit Focused Area (FR FA)**
- **Dedicated Stare – Fast Frame Focused Area (FF FA)***
- ***Step-Stare - TI High Sense Focused Area (HS FA) – not shown***

SBIRS Improves Active and Passive Defense Ops

Improved State Vector Velocity Estimate *

SBIRS Inc 1 (DSP)	x
SBIRS	0.25 x



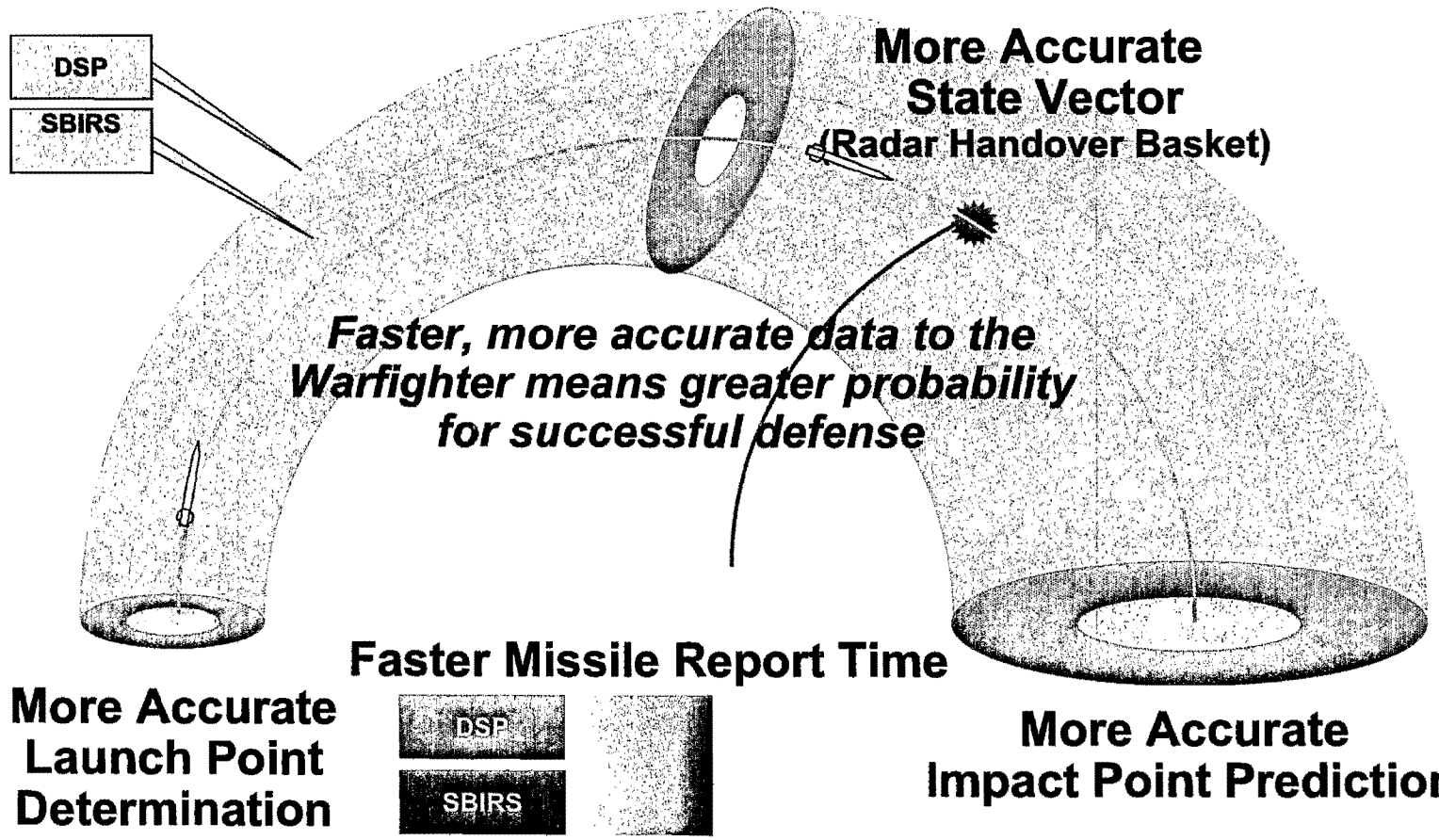
Improved Impact Point Prediction *

SBIRS Inc 1 (DSP)	x
SBIRS	0.10 x

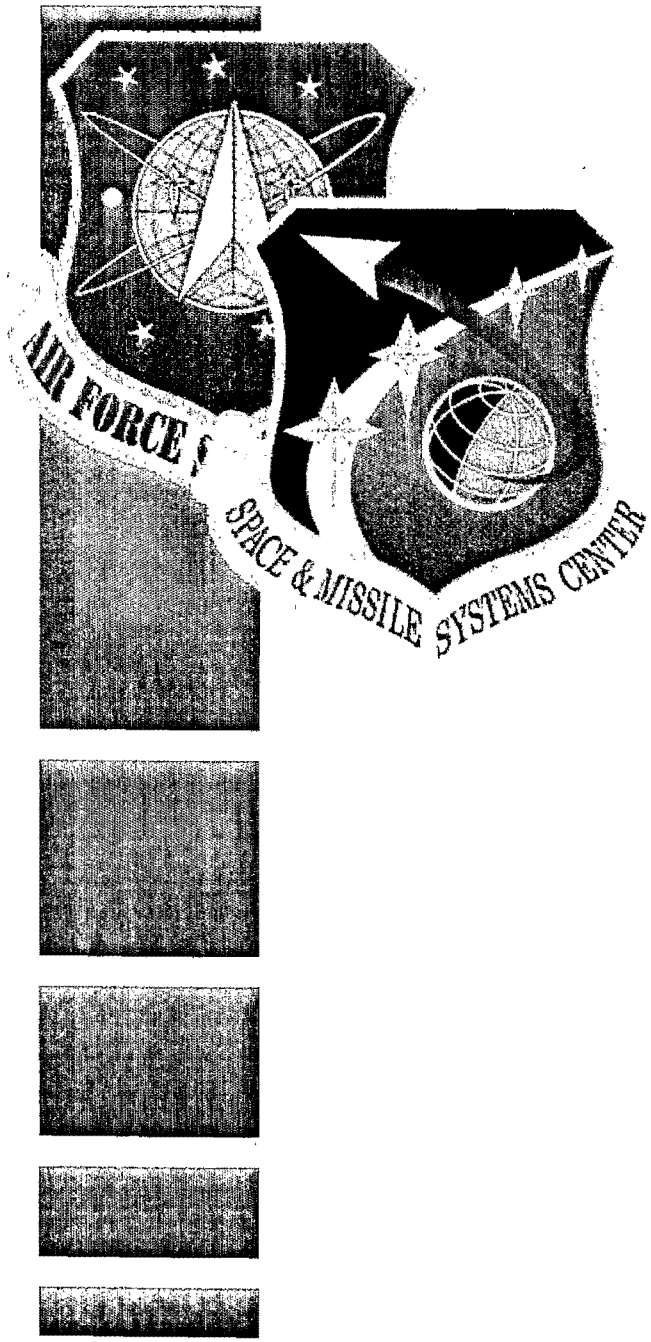
*Comparison of theater requirements

Impact Point Prediction Allows Enhanced Passive Defense
State Vector Accuracy Provides Enhanced Active Defense

A Revolution in Capability



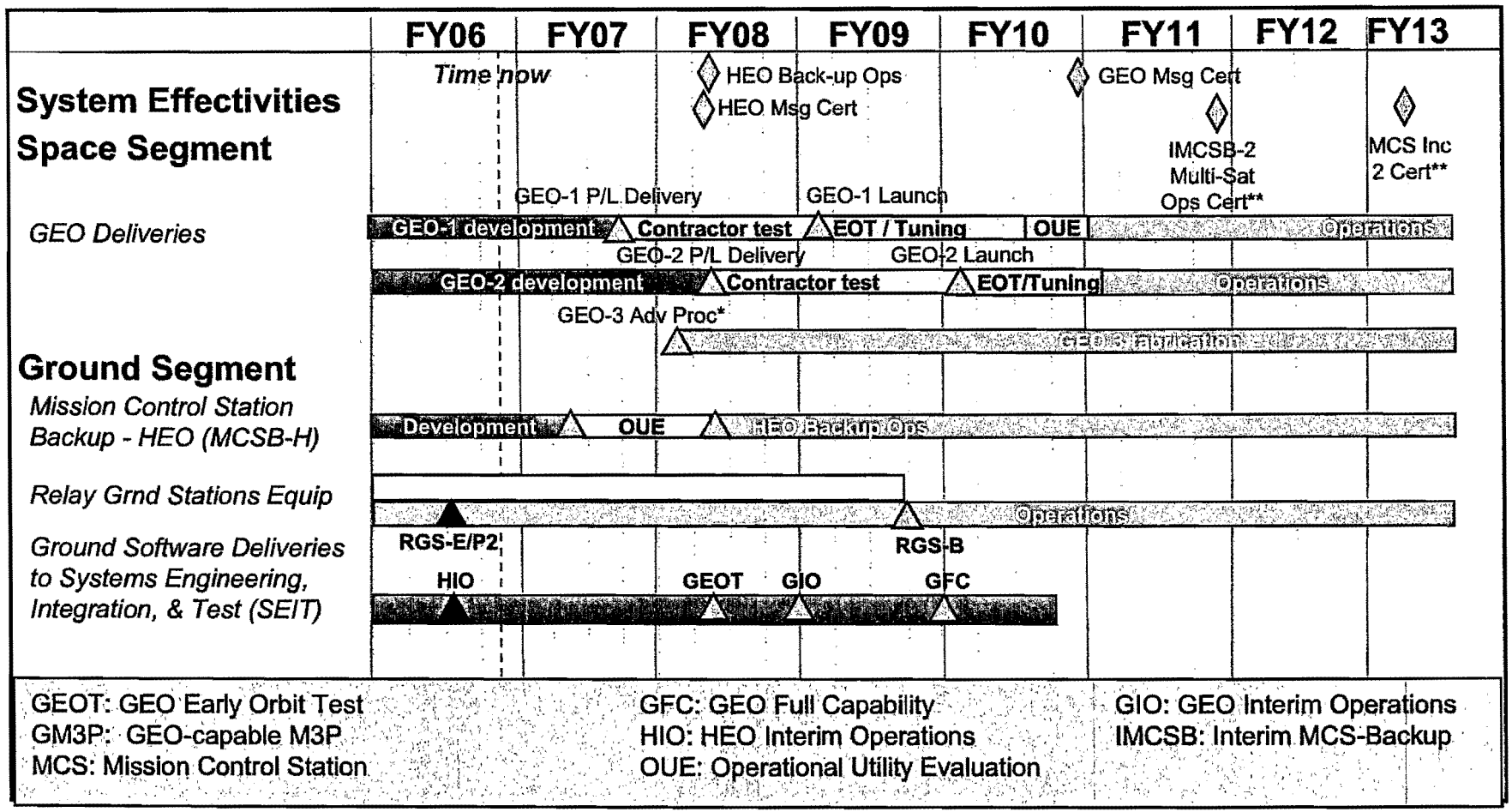
Ratios are accurate within each comparison



SBIRS – Transformational Capability

Col Roger Teague
Space Group Commander
30 Nov 2006

SBIRS Schedule



GEOT: GEO Early Orbit Test
GM3P: GEO-capable M3P
MCS: Mission Control Station

GFC: GEO Full Capability
HIO: HEO Interim Operations
OUE: Operational Utility Evaluation

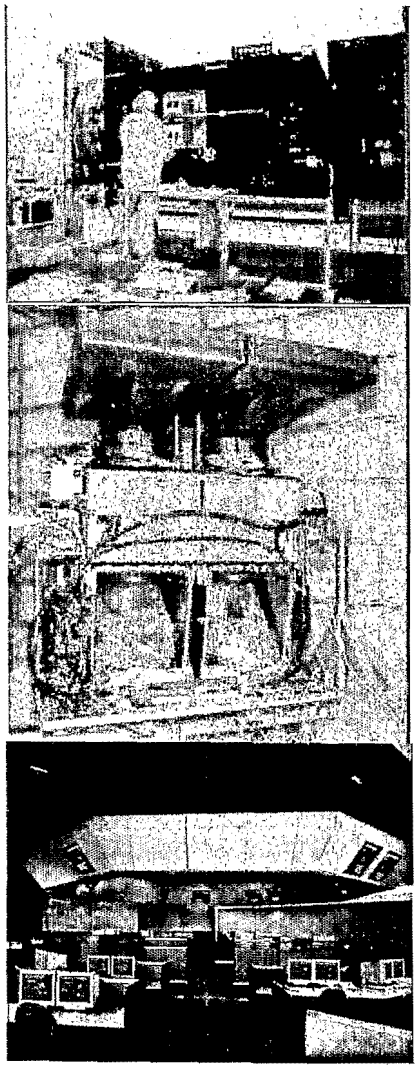
GIO: GEO Interim Operations
IMCSB: Interim MCS-Backup

Concept activities
Production / fielding
Design / development
Operations / sustainment
Integration / test
Key events
Effectivities

* Assumes FY08 funding available

** Precede by an OT&E activity

SBIRS Status



- Completed Spacecraft Bus Functional Testing -- 16 Aug
  - First-time integration of all Spacecraft systems
  - Demonstrated mechanical/electrical maturity to enter First-time Thermal Vacuum Testing Dec 06
- Completed Payload Acoustic Testing -- 13 Sep
  - Key to payload acceptance - demonstrated launch vibration and acoustic environment
  - Payload Thermal Vacuum 2 testing projected for Jan 07
- Completed first GEO Intersegment Test (SST 3101) --16 Aug
  - Risk reduction - Demonstrated commanding of the flight simulator by the ground system
  - Exercised backup control station, factory support and the Contractor/Wing GEO test teams & processes
- Delivered Ground HIO (HEO Interim Ops) S/W to Sys Test / HEO Training Center Ready for Operations 21 Apr / 15 Sep