US Army Space and Missile Defense Command / US Army Forces Strategic Command

Future Warfare Center

Larry Burger, Director
Future Warfare Center

Space and Missile Defense - From Concept to Reality

Relationships

SMDC / ARSTAT

Commanding General

Deputy Commanding General - Operations

Director Future Warfare Center

Deputy to the Commander For Research, Development and Acquisition

Operational Forces
- 100th Missile Defense Brigade (GMD)
- 1st Space Brigade
- Astronaut Detachment

Ballistic Missile Defense Systems Manager

Space Personnel Proponency Office

Innovative DOTMLPF Integration
- Battle Lab
- Directorate of Combat Development
- Decision Support Directorate

Research, Development and Acquisition Efforts
- Technical Center
- Test and Evaluation
  - USAKA/RTS and HELSTF
- Interoperability
- Integration
- Contracting and Acquisition

OPERATIONS **REQUIREMENTS** **MATERIEL**

Role as Proponent

Specified Proponent for Space and IMD

- Full DOTMLPF responsibility for Army Space and High Altitude related issues
- Authority & responsibility to develop and advocate Army positions on space-related functions (Joint, Combined, External)

Branch Proponents

Signal Center & School	Intelligence Center & School	Field Artillery Center & School	Engineer Center & School	Chemical School	Air Defense Artillery School	Combined Arms Center

Not duplicating TRADOC…integrating for TRADOC

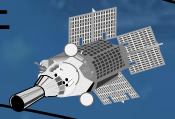
Why Care About Space Weather?

ISSUE
Military Operations Depend on Integrated Air, Land, Sea, and Space Systems

IMPACT
Lack of Timely, Accurate , Relevant Weather Information May Fracture the Seamless Battlespace

STATUS
Multi-Hundred Billion Dollar Investment Not Optimized--
COMBAT EFFECTIVENESS JEOPARDIZED

MAGNETOSPHERE



DSP
MILSTAR
DSCS

RADIATION BELTS

GPS

IONOSPHERE

DMSP

SHUTTLE

MESOSPHERE

Space Weather
Terrestrial Weather

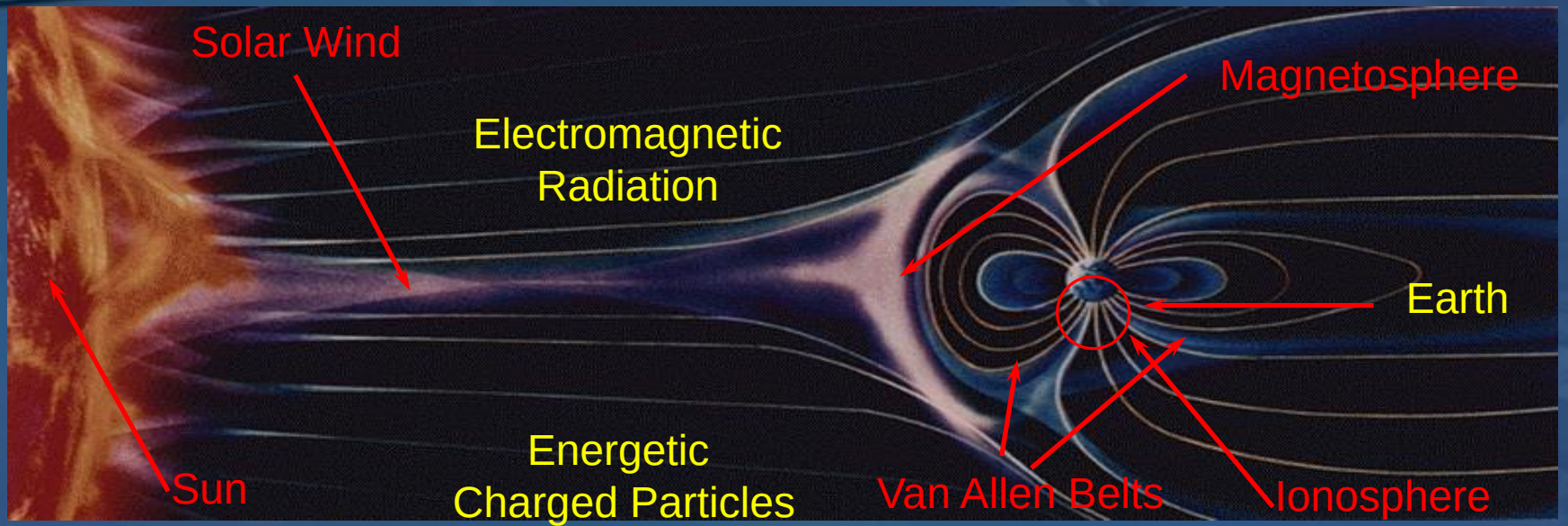
STRATOSPHERE

U-2

TROPOSPHERE

SEAMLESS ENVIRONMENT

The Space Environment



Solar electromagnetic radiation and energetic particles impact the Earth's magnetosphere and ionosphere, causing space weather disturbances which degrade military systems

What do we teach on Space Weather

- Army Space Soldiers learn about space weather in the following courses – SOOQC, TSOC and AF Space 100 & 200
  (Space Operations Officer Qualification Course, Tactical Space Operators Course)
- Space environment and space weather 101 (How solar activity impacts satellites, atmosphere, signals and the ground user)
- Military systems impacted by space weather events
- Capabilities and limitations of space weather forecasting
- Space weather warnings and advisories
- SOS (Space Operation System) tools and reach back resources to determine the impact of space weather events

Army Space Force Structure

Organic Space Forces

Division

Space Support Element

Chief, SSE
LTC, FA40/SOO

SSE Officer
MAJ, FA40/SOO

25S30

3 Soldiers ea.

18 Divisions
(10 AC, 08 RC)

Corps

Space Support Element

Chief, SSE
LTC, FA40/SOO

SSE Officer
MAJ, FA40/SOO

25S30

4 Soldiers ea.

3 Corps
(AC)

Army

Space Support Element

SSE Officer
MAJ, FA40/SOO

Chief, SSE
COL,
FA40/SOO

Dep Chief, SSE
LTC, FA40/SOO

25S30

6 Soldiers ea.

6 Theater Armies
(AC)

Augmentation Space Forces

Army Space Support Team

TM LDR,
MAJ,
FA40/SOO

Dep , CPT
01A (FA40 eventually)

96B30

25S20
25B20
21Y20

27 AC and RC ARSSTs today

Army Space Support Team – Tactical Set (ARSST-TS)

Each ARSST will receive one ARSST-TS

*** SSEs get one as "TPE", if deployed to the box**

FA40 Space Environment Tools

- National Space Environment Services
  - Air Force Weather Agency (AFWA)
    - Daily World Regional Space Environment Situational Awareness
    - Alerts and Warnings
    - Forecasts: UHF SATCOM, HF, GPS, High Alt Radiation, Radar Interference
    - Satellite Ops Impacts, Space Object tracking
  - NOAA / National Weather Service – Space Weather Prediction Center
    - Alerts and Warnings
    - Today's Space Weather
- Joint Space Operations Center (JSpOC) daily space brief
- Space Operations System (SOS) software applications
  - Single Integrated Space Picture (SISP) UHF/HF/GPS Predictions
- AFTTP 3-1.28 Tactical Employment – Space

Space Way-Ahead

- Better prediction capabilities
- Better understanding of effects
- Enhanced mitigation and survivability