



SPACE AND MISSILE SYSTEMS CENTER

Prototyping in the Space Development Corps

Shannon C. Pallone

Senior Materiel Leader, Tactical SATCOM
Space Development Corps

April 2021



Space Development Corps

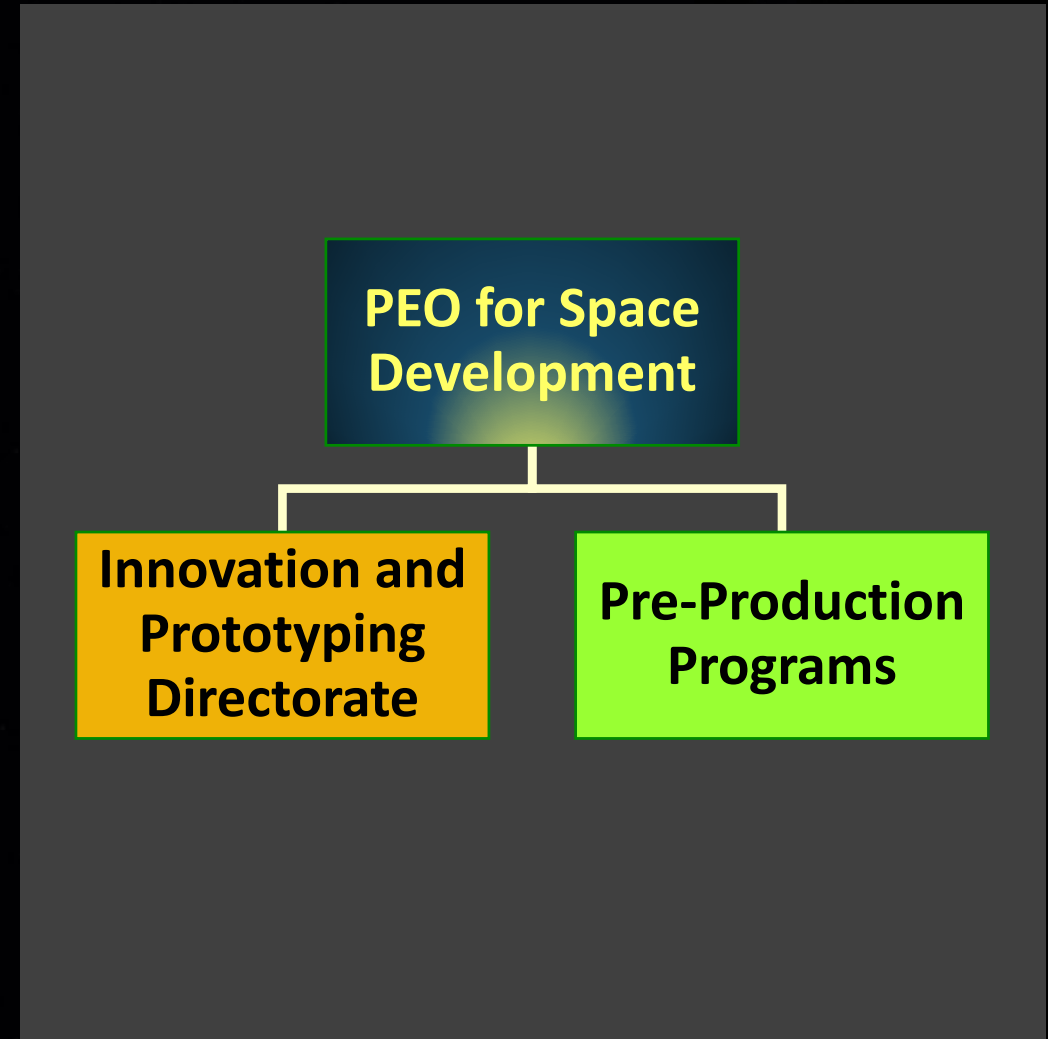
SPACE AND MISSILE SYSTEMS CENTER

MISSION

Outpace the threat by developing next-generation space warfighting capabilities today!

VISION

The Development Corps will be the pioneers establishing strategic space advantages through rapid technology maturation, operations prototyping, and program development. We will continue to push the frontier by creating and demonstrating cutting-edge concepts and turning them into production ready programs.





Experimenting, Demonstrating and Prototyping Space Concepts

To shape the future architecture

SPACE AND MISSILE SYSTEMS CENTER

Unprecedented Access to Innovation



SpEC
USSF's acquisition tool for accelerating innovative prototyping

Building Responsive Space Access, Expanding the Space Test Ecosystem



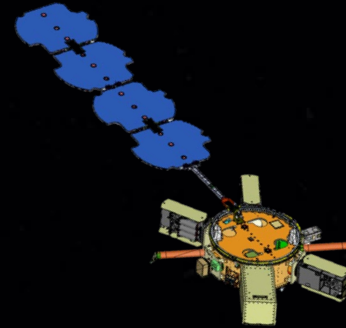
STP
Maximizing space access for S&T experiments, proving out new launch concepts



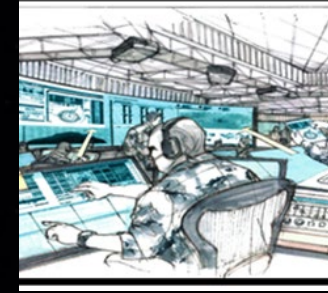
RALI
Pathfinding using emerging commercial small launch vehicle



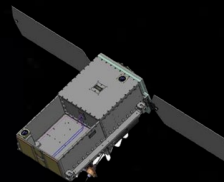
LDPE/ROOSTER
Freight train to GEO... and a common bus for I&P



Hosted Payload Interface Unit
Enabling NSS payloads on untrusted hosts



RSC
The USSF's Prototype Ops Center

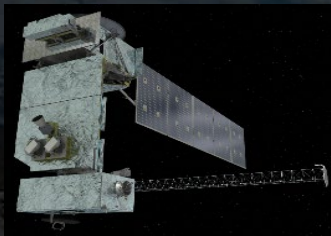


Tetra
Small Sat to develop TTP at GEO

Strategic Partnerships



QZSS Hosted Payload
Pathfinding hosting NSS payloads on allied systems

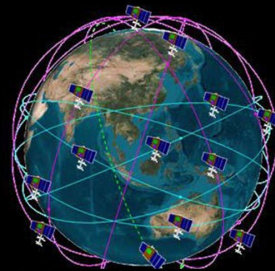


STPSat-6
White House directed partnership with NASA and DoE's NNSA; experiments for AFRL, NRL, USAF

Investing in More Resilient Architectures



Blackjack/Casino
Enabling rapid tech refresh through pLEO

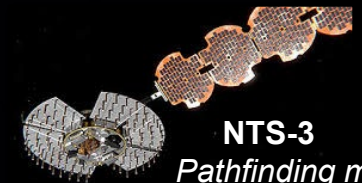


EO/IW System
A scalable, distributed constellation of sensors

Developing Leap-ahead Capabilities for the Warfighter



Wide Field of View
Maturing OPIR ground algorithms and staring sensor technologies



NTS-3
Pathfinding multi-layer PNT architecture



OBAC / TAP Lab
Exploiting OPIR and EM data to enhance USAF/USSF mission areas



Competitively Prototyping Next Generation Space Systems

To ready threat-relevant and cost-effective solutions

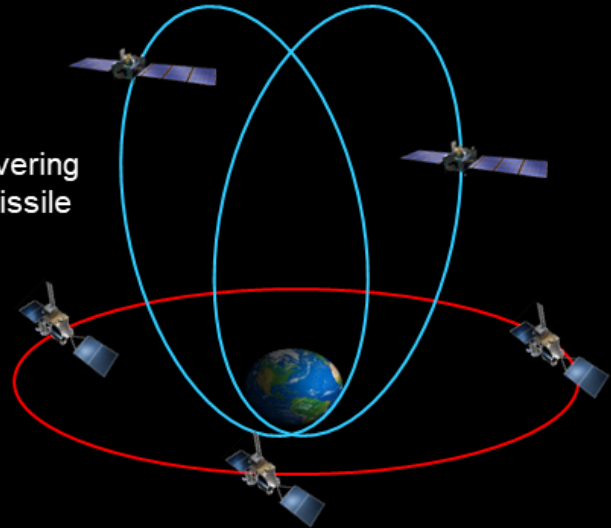
SPACE AND MISSILE SYSTEMS CENTER

Next Gen Overhead Persistent Infrared (OPIR)

Procuring space-based, strategically survivable missile warning satellites to form a new highly resilient Space Warfighting Construct (SWC)-based architecture. Targeting first launches in FY25 (NKG) and FY29 (NGP).

Next Gen Polar (NGP)

Five vehicle constellation delivering global tactical and strategic missile warning coverage



Next Gen GEO (NKG)

Protected Tactical SATCOM (PTS)

Provides robust anti-jam capability, reduced latency, and increased capacity over existing protected tactical comm to tactical users in highly contested theaters in close proximity to adversaries.

Developing a modular payload using Protected Tactical Waveform (PTW); leverage PTES ground infrastructure to support PTS

Protected Tactical Enterprise Service (PTES)

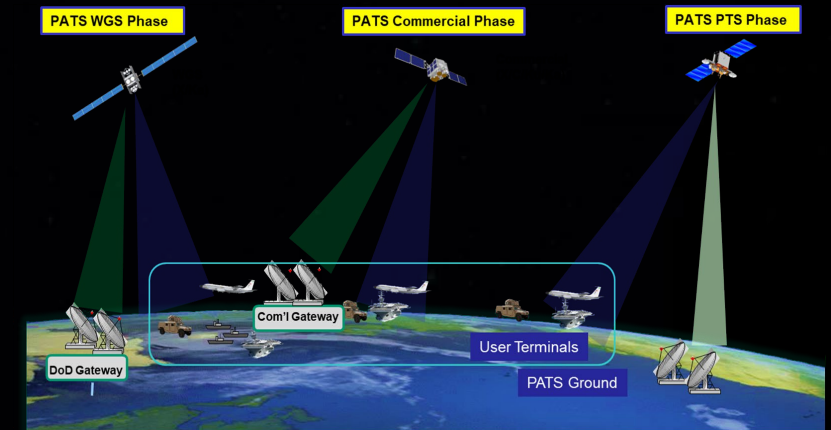
Provides anti-jam protection via Wideband Global Satellite Comm to tactical warfighters currently unable to operate through interference in anti-jam/area denial operational environment



Evolved Strategic SATCOM (ESS)

Follow-on replacement to the Advanced Extremely High Frequency strategic SATCOM mission, providing worldwide survivable communications for ground, sea, and air assets for Nuclear Command, Control, and Communications.

Protected Anti-Jam Tactical SATCOM (PATS)



Air Force & Army Anti-Jam Modem (A3M)

Teaming w/ Army PEO C3T to develop, produce, and field Protected Tactical Waveform (PTW) capable modems

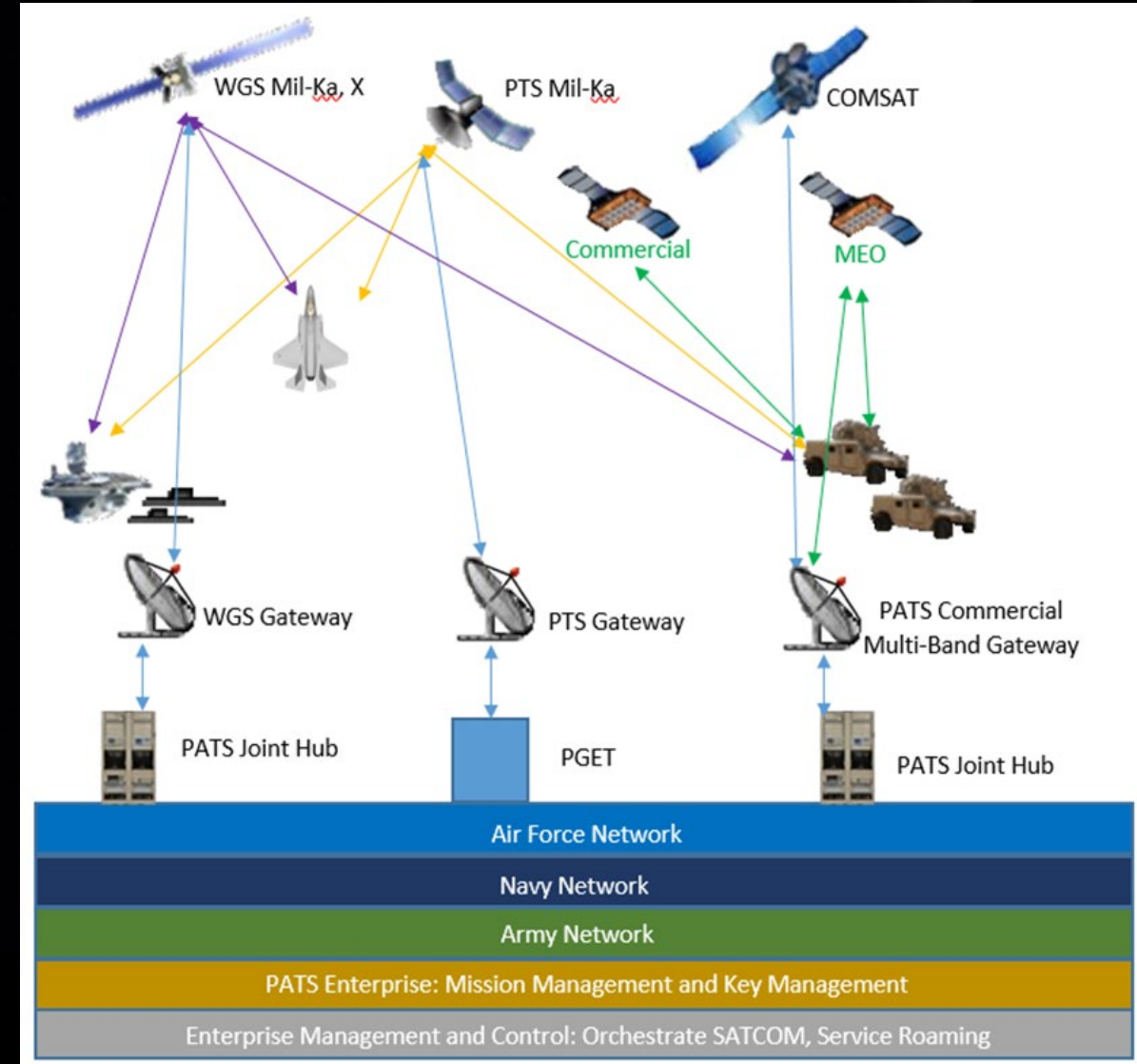


Protected Anti-Jam Tactical SATCOM

A prototyping pacesetter

SPACE AND MISSILE SYSTEMS CENTER

- **Completed smaller prototyping ahead of primary prototype project**
 - Early, meaningful exchanges helped the Government identify what to go after
 - Built a robust industrial base that the Government could later leverage
- **Pathfinding USSF's digital engineering adoption**
 - PATS digital engineering allows for multiple teams / vendors to build out architecture simultaneously using ASOT
 - SMC – building satellites / enterprise ground system
 - PTS payloads from multiple contractors
 - PTW modem from multiple contractors
 - Navy – building WAMS
 - Int'l Partners – conducting proof of concept demos
 - Commercial vendors – collaborating on future COMSATCOM phase



ASoT – Authoritative Source of Truth
PTS – Protected Tactical SATCOM
PTW – Protected Tactical Waveform
WAMS – Wideband Anti-Jam Modem System



What We Need from Industry

SPACE AND MISSILE SYSTEMS CENTER

- **Understand our problem set**
- **Show up where we can have meaningful information exchanges**
- **Bring diverse solutions**
 - Proven where we need it
 - Primed for insertion of threat-defeating, innovative new ideas and technology



New Space Enterprise Consortium “sprint” events provide opportunities for industry to collaborate with Government on the realm of possible in terms of emerging technology and capabilities
space-enterprise.org



SPACE AND MISSILE SYSTEMS CENTER

Questions?