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2d Space Operations Squadron

A composite image showing five GPS satellites in orbit around Earth. The satellites are arranged in a semi-circle across the frame, each with its solar panels extended. The Earth's surface is visible below, showing blue oceans and white clouds. The background is the blackness of space.

*Home
of the
Global Positioning System*



2d Space Operations Squadron

Mission

Provide combat-ready space warfighters delivering position, navigation, and timing to optimize civilian operations and Navigation Warfare (NAVWAR) for the full range of joint and coalition operations, across all domains.

Vision

The world's premier Global Navigation Satellite System (GNSS) provider innovating and accelerating positioning, navigation, and timing through modernization and integration.





2d Space Operations Squadron

Chief Of Space Operations

**Space Force
Headquarters Staff**



**Space
Operations Command**

Peterson SFB, CO

Responsible For Generating,
Presenting, and Sustaining Space
Warfighting Capability for
Combatant Commanders



**Space
Systems Command**

Los Angeles AFB, CA

Responsible For Developing,
Acquiring, Equipping, Fielding,
And Sustaining Lethal And
Resilient Space Capabilities



**Space
Training & Readiness
Command**

Peterson SFB, CO

Responsible For Lethality By
Developing Combat-ready Space
Forces And Space Warfighting
Capabilities And Expertise

The USSF Will Innovate Faster to Outpace Threats From Adversaries



2d Space Operations Squadron

SPACE OPERATIONS COMMAND SPACE MISSION DELTAS



SpOC WEST

SpOC West / CFSCC integrates, conducts, and assesses global space operations in order to deliver combat relevant space capabilities to Combatant Commanders, Coalition partners, the Joint Force, and the Nation



STAR DELTA
(P)
PETERSON AFB
(TEMPORARY)

STAR DELTA
Space Training and Readiness (Provisional)*

Builds lethality by developing combat-ready space forces and space warfighting capabilities in order to innovate and dominate in all domains



SPACE DELTA 2
SDA
PETERSON AFB

SPACE DELTA 2
Space Domain Awareness

Integrates ISR, space observation and environmental monitoring to enable space battle management and support ground operations



SPACE DELTA 3
SEW
PETERSON AFB

SPACE DELTA 3
Space Electronic Warfare

Operates electronic attack, protection, and support capabilities to protect and defend the space domain



SPACE DELTA 4
MW
BUCKLEY AFB

SPACE DELTA 4
Missile Warning

Provides strategic and theater missile warning to the United States and our International Partners



SPACE DELTA 5
C2
VANDENBERG AFB

SPACE DELTA 5
Command and Control

Maintains global awareness of operational environments and space forces to enable data-driven decisions



SPACE DELTA 6
CYBER OPS
SCHRIEVER AFB

SPACE DELTA 6
Cyberspace Operations

Executes cyber operations to protect space operations, networks, and communications, and operates the Air Force Satellite Control Network



SPACE DELTA 7
ISR
PETERSON AFB

SPACE DELTA 7
Intelligence, Surveillance and Reconnaissance

Provides intelligence data to allow for the detection and characterization of adversary space capabilities



SPACE DELTA 8
SATCOM - NAVWAR
SCHRIEVER AFB

SPACE DELTA 8
Satellite Communications & Navigational Warfare

Provides position, navigation, timing and satellite communications to U.S. military, coalition partners, interagency partners, and commercial / civilian users



SPACE DELTA 9
OW
SCHRIEVER AFB

SPACE DELTA 9
Orbital Warfare

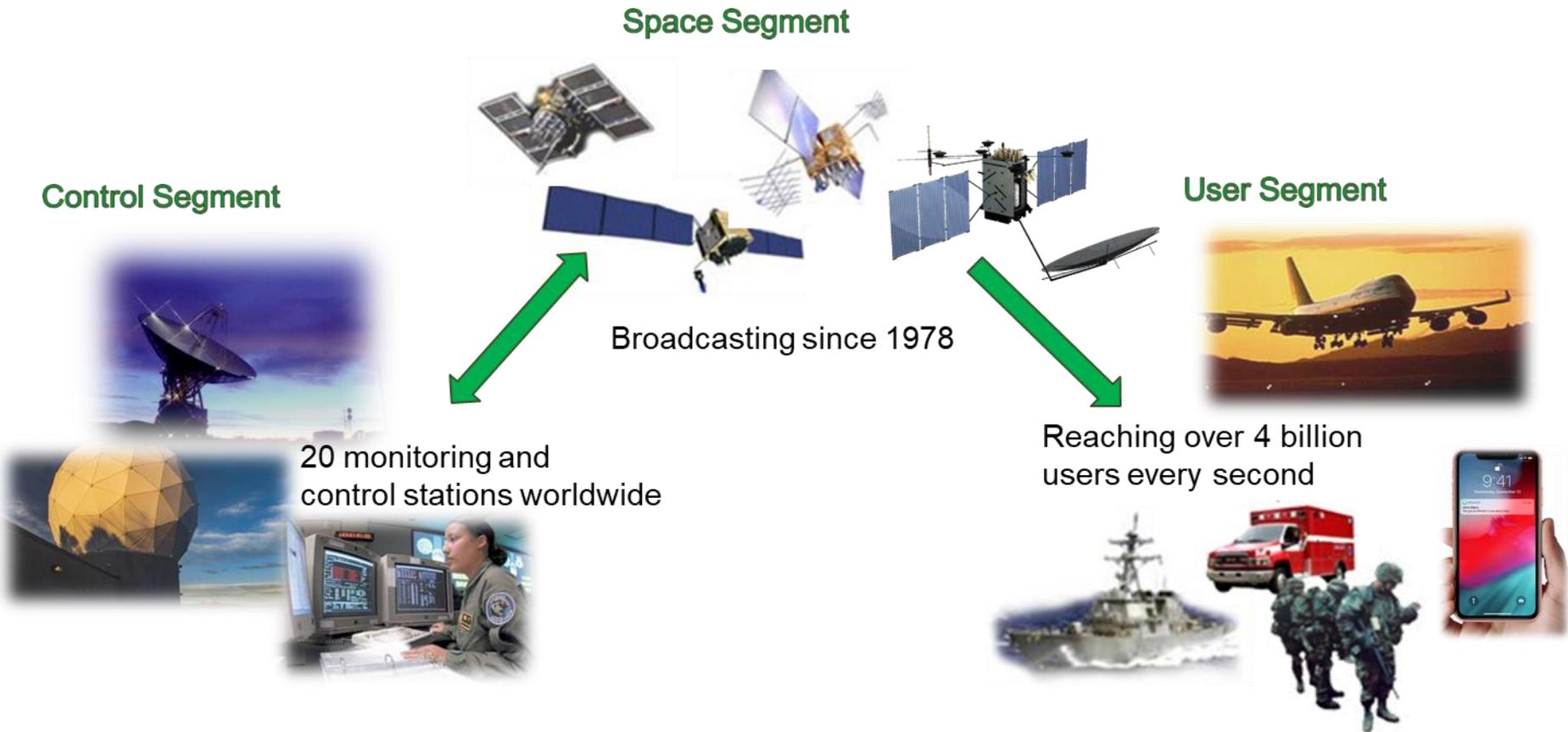
Conducts protect and defend operations from space and provides response options to deter and defeat adversary threats in space

* STAR Delta (P) will move to STARCOM upon activation

SEMPER SUPRA



GPS Architecture Overview



Global Reach to Civilian, Commercial, Coalition & Warfighters



GPS Accomplishments & Lines of Effort

■ **Modernization**

- **Accepted four Next-Gen GPS III vehicles into active constellation**
- **Fielded five C2 updates in last two years**
- **Delivered M-Code Early Use (Jun '20) – supporting MGUE testing**
- **Enabled global M-Code coverage with 24 M-Code capable satellites**
- **Conducting early ops for Next-Generation Control Segment (OCX)**

■ **Innovation**

- **Fielded State of Health Automation**
- **Restructured crews to gain manning efficiencies**
- **Testing battlespace awareness / common operational picture (COP) tool**

■ **Warfighter Development**

- **Matured GPS Warfighter Collaboration Cell (GWCC)**

Ushering in the Next-Generation GPS Era



GPS Modernization

Space Segment

SV families provide L-Band broadcast to User Segment

GPS IIA/IIR

- Basic GPS
- Nuclear Detonation Detection System (NDS)

GPS IIR-M

- 2nd Civil Signal (L2C)
- New Military Signal
- Increased Anti-Jam Power

GPS IIF

- 3rd Civil Signal (L5)
- Longer Life
- Better Clocks

GPS III (SV01-10)

- Accuracy & Power
- Increased Anti-Jam Power
- Inherent Signal Integrity
- 4th Civil Signal (L1C)
- Longer Life
- Better Clocks

GPS IIIF (SV11-32)

- Unified S-Band Telemetry, Tracking & Commanding
- Search & Rescue (SAR) Payload
- Laser Retroreflector Array
- Redesigned NDS Payload

Control Segment

TT&C of Space Segment assets & distribution of data to user interfaces

Legacy (OCS)

- Mainframe System
- Command & Control
- Signal Monitoring

Architecture Evolution Plan (AEP)

- Distributed Architecture
- Increased Signal Monitoring Coverage
- Security
- Accuracy

OCX Block 0

- GPS III Launch & Checkout System
- GPS III Contingency Ops (COps)
- GPS III Mission on AEP
- M-Code Early Use (MCEU)
- Update OCS to operationalize Core M-Code

OCX Block 1/2

- Fly Constellation & GPS III
- Begin New Signal Control
- Upgraded Information Assurance

OCX Block 2+

- Control all signals
- Capability On-Ramps
- GPS IIIF Evolution

User Segment

Applies Space and Control Segment data for PNT applications

Continued support to an ever-growing number of applications

- Annual Public Interface Control Working Group (ICWG)
- Standard Positioning Service (SPS) Performance Standard Updates
- Precise Positioning Service (PPS) Enhancements
- Sustained commitment to transparency
- Visit GPS.gov for more info

Modernized Civil Signals

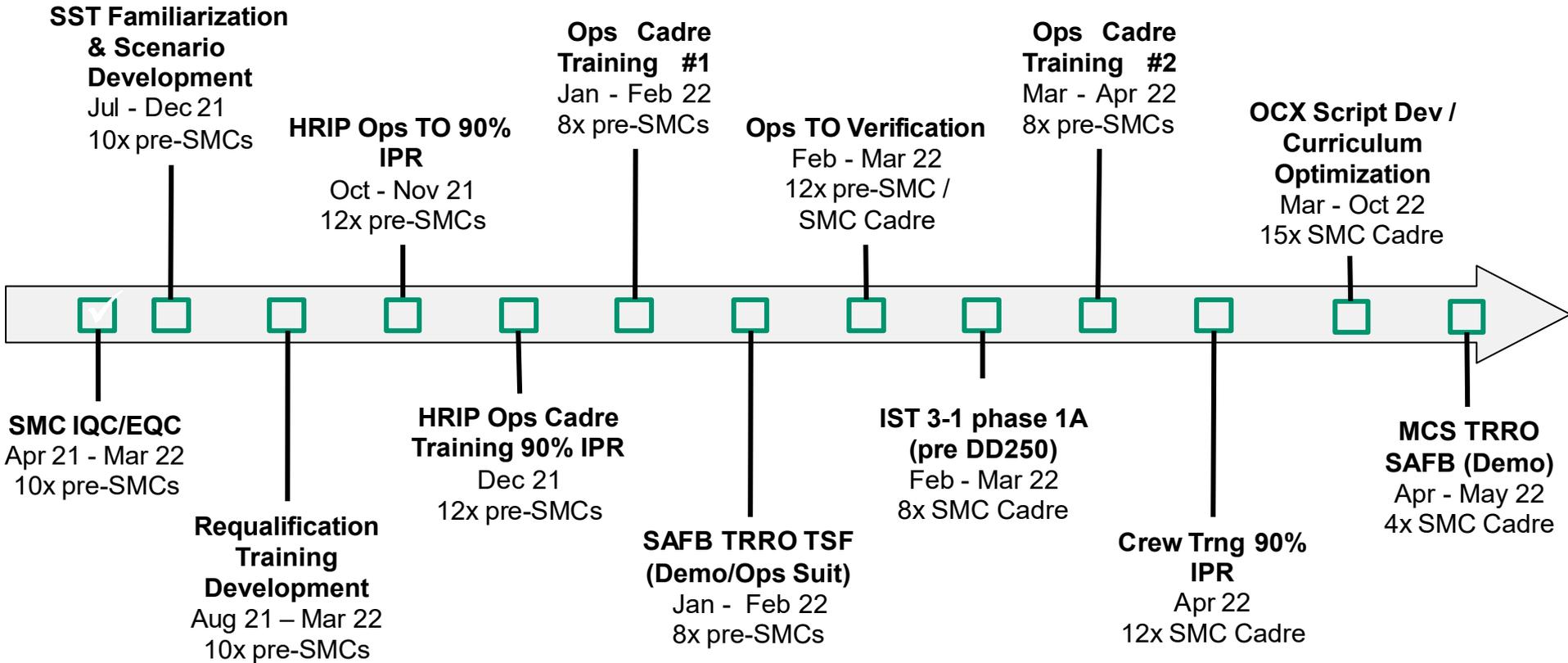
- L2C (Various commercial applications)
- L5 (Safety-of-life, frequency band protected)
- L1C (Multi-GNSS interoperability)

Accelerating & Elevating GPS Operations



OCX "At-A-Glance" Early Operations Events

SMC = Special Mission Certification cadre IAW AFI 13-602 V1



Significant OCX Early Ops Rqmts over Next 20+ Months



OCX “At-A-Glance” Early Operations Events

2/19 SOPS DOM

1. Active Duty Component – OCX Special Mission Certification (SMC)

2. Reserve Component – OCX Special Mission Certification (SMC)

Objective: develop OCX cadre responsible for the OCX spacecrew transition including early-operation events, curriculum optimization, certification development, and operational acceptance.

2/19 SOPS DOU

3. Active Duty Component – OCX Requalification Training (RT)

4. Reserve Component – OCX Requalification Training (RT)

Objective: requalify seasoned AEP operators to OCX operators to support dual operations and OCX steady-state operations.

DEL8 CTS

5. Active Duty Component – OCX Mission Qualification Training (MQT)

6. Reserve Component – OCX Mission Qualification Training (MQT)

Objective: develop and implement an OCX MQT training program to ensure spacecrew readiness for OCX steady-state operations.



GPS Warfighter Collaboration Cell

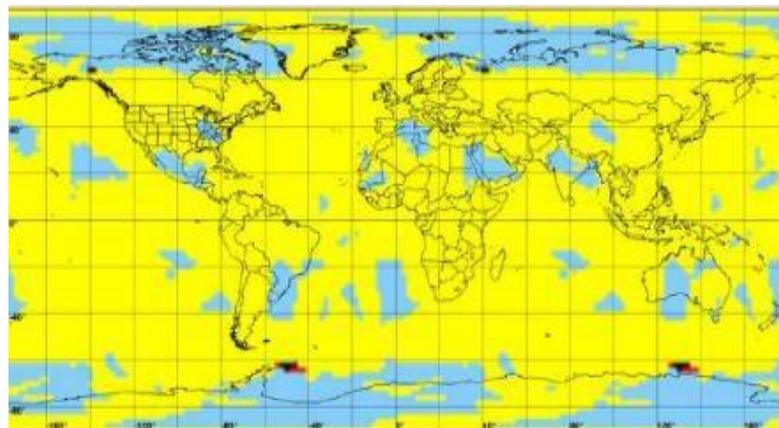
GPS Warfighter Collaboration Cell (GWCC)

- US Gov, Partner focal point for near real-time products to authorized users
- Collaboration w/ 35 MIL & 4 CIV Orgs
- Short-term tasking requests

Products Delivered

- 192 Space Support Requests (SSR) for US and Coalition Forces (via CSpOC)
- 234 Requests for Anomaly Analysis (RAA) worldwide to civil & government users
- 160 Requests for Information (RFI) requiring technical GPS analysis

Performance Products



June 2018-August 2021: ~300,000+ products creates for users

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