

ASSURED POSITIONING NAVIGATION & TIMING



ARMY  
FUTURES  
COMMAND

# U.S. Army Futures Command

## Assured Positioning Navigation & Timing Cross Functional Team (APNT CFT)

UNCLASSIFIED

Approved for Release, Distribution A, AFC APNT 2019-002



# APNT CFT Lines of Effort

## APNT



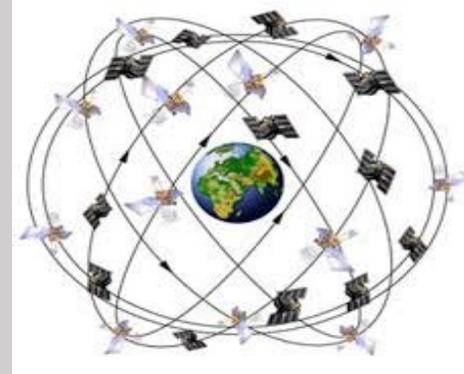
**WHAT:** PNT provides trusted data to the Soldier

**WHY:** PNT is a critical enabler providing location and timing for most Army systems

**HOW:** Establish a PNT Modernization Strategy for the Army; Develop Requirements; Synchronize efforts across Research Development and Acquisition communities; Reduce the number of different solutions; eliminate vendor unique architectures; Enable resiliency

**WHEN:** Initial Capability Delivery - Dependent on PNT system integration schedule; Mounted APNT FY21

## Tactical Space



**WHAT:** Provide Soldiers access to PNT Augmentation, Communications and Reconnaissance, Surveillance, and Target Acquisition (RSTA) / Intelligence, Surveillance, Reconnaissance (ISR)

**WHY:** Establish a robust and resilient PNT, Communications, and RSTA Operational Architecture through Space-based (Low Earth Orbit), Multi-Domain capabilities

**HOW:** Use advanced commercial manufacturing for military payloads, satellite and launch platforms

**WHEN:** Initial Capability Delivery (Communications and RSTA/ISR) FY21-FY22

## Navigation Warfare



**WHAT:** Provide defensive and offensive PNT techniques and technologies in support of defense or offensive operations to counter adversaries

**WHY:** Establish a synchronized offensive PNT capability through disruptive technologies in conjunction with existing and future defensive APNT capabilities

**HOW:** Develop point specific and area wide degradation and denial

**WHEN:** Initial Capability Delivery (Classified)



# PNT Assessment Exercise (PNTAX) 19

Date(s): 22 Jul-17 Aug 2019

Location: White Sands Missile Range (WSMR)

## PNTAX Objectives:

- Present operationally-realistic threat scenarios to Dismounted, Mounted and NAVWAR sensor stand-alone systems and components
- Assess and identify PNT system performance and mission effectiveness
- Assesses emerging concepts, techniques and materiel (S&T / industry) systems / capabilities for participation in a Forward Operational Assessment (FOA) / theater exercise

## The So What:

- Provides technical (capability performance) and real world (enemy most likely/worst case) threat environment scenarios
- 68 technologies/systems across APNT, NAVWAR and Tactical Space supporting Munition, Missile, Ground and Aviation platforms
  - More Space based technologies/systems starting in FY20
- Informs Army Science & Technology and Programs of Record (PoR) investment strategies
- Soldier touch-points supporting new technology and current PoRs
  - Supports real feedback for development of new technology and DoD PoRs
  - Ensures proper feedback for mission effectiveness and efficiency



Patriot Battery Systems

JPADS



\* M1126 INFANTRY CARRIER VEHICLE (ICV)



USAF HC-130J



\* M1131 FIRE SUPPORT VEHICLE (FSV)



Horizon Alternate Navigation (USMC)

**PNTAX Highlights:**

- 68 systems to include integrated PoRs participating at Brigade and below
- Soldiers participation



M777



Electronic Warfare Planning & Management Tool (EWPMT)



NAVSense (NAVWAR SA)



Sensor-to-Shooter (LEO sensors)

**APNT, Space and NAVWAR experimentation and prototyping to support operations in GPS challenged environment**



# Backup Charts

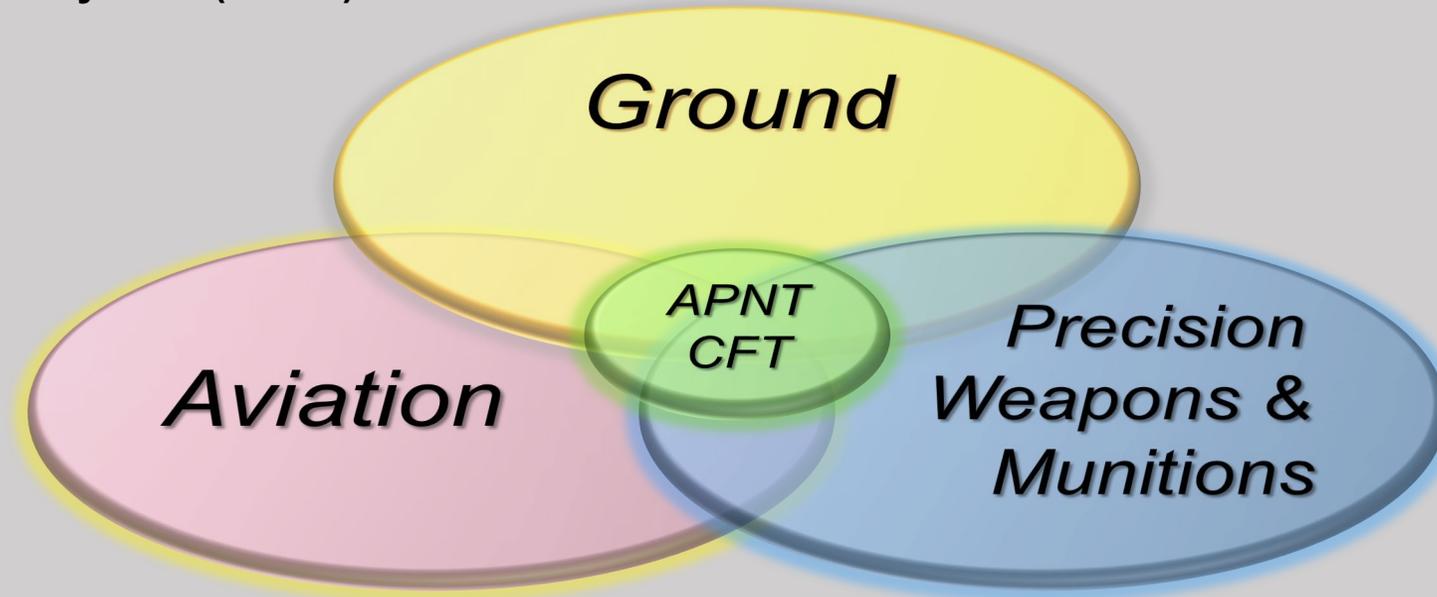


# APNT Line of Effort

## Ground

Mounted APNT System (MAPS)

Dismounted APNT System (DAPS)



## Aviation

Embedded GPS/Inertial Nav System-M-Code (EAGLE-M)  
Multi-Platform Anti-Jam GPS Navigation Antenna (MAGNA)  
Resiliency and Software Assurance Modifications (RSAM)  
Vision Based Navigation (VBNT)

## Precision Weapons & Munitions

Precision Guided Munitions (PGMs)  
Precision Weapons  
System-of-Systems "Kill Chain"

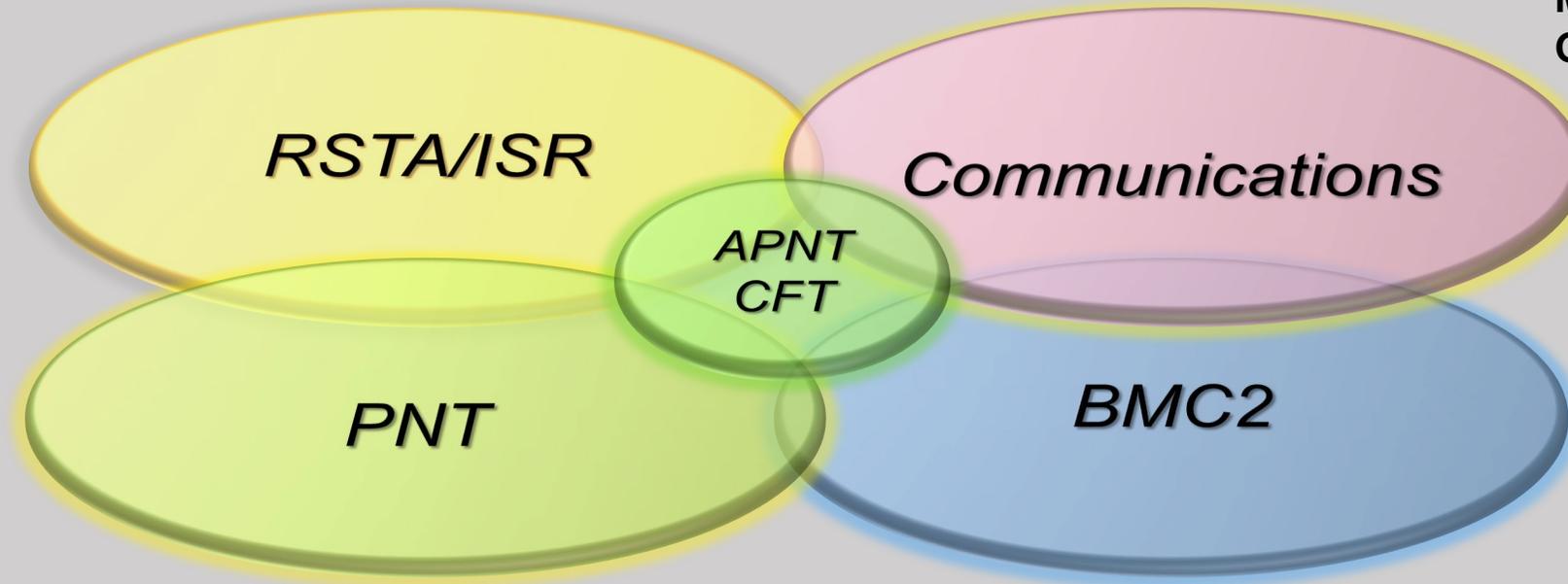
**The APNT CFT will deliver requirements for technologies that provide Soldiers access to accurate and trusted PNT even when GPS signals are degraded or denied**



# Tactical Space Line of Effort

RSTA/ISR\*  
Kestrel Eye  
Gunsmoke

Communications  
Mega-Constellation  
Ground Terminal



Position, Navigation & Timing  
Allied Global Navigation Satellite System (GNSS) solutions  
Other signals of Interest

Battle Management / Command & Control (BMC2)  
Sensor-to-Shooter  
Tip and Cue  
Tactical Ground Station / Uplink / Downlink

**The APNT CFT will develop and integrate a strategy to provide Low Earth Orbit-based capabilities that will enable diverse Warfighter operations in anti access / area denial environments**

\* Reconnaissance, Surveillance, Target Acquisition / Intelligence, Surveillance, Reconnaissance

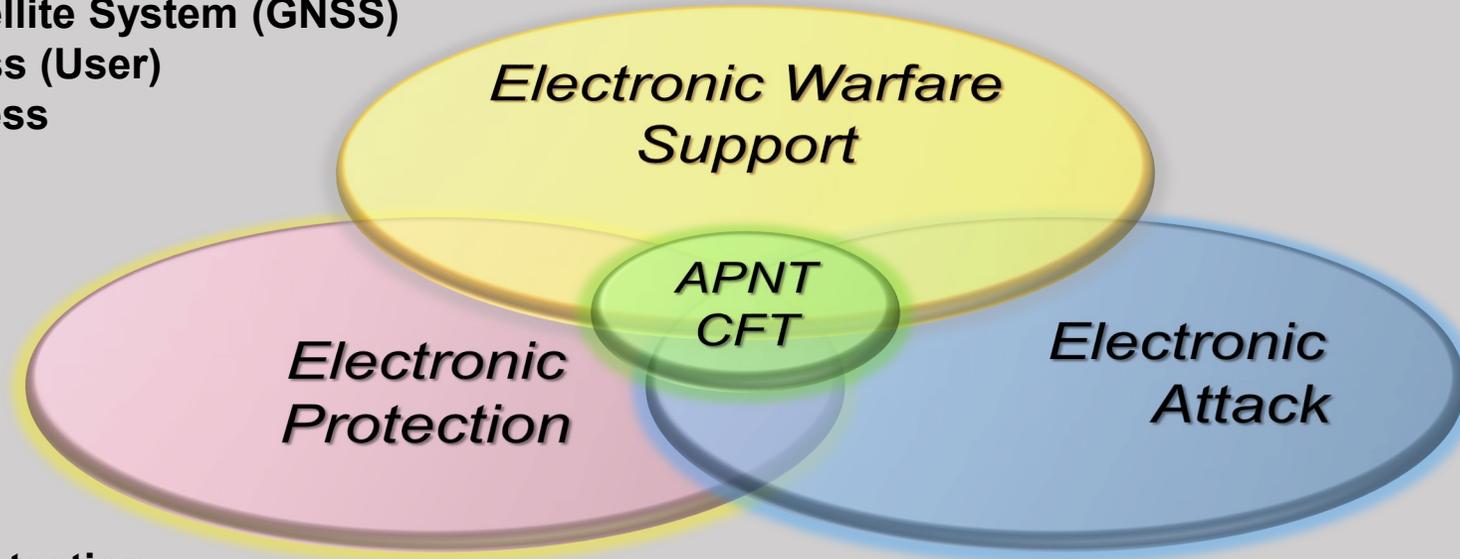


## Electronic Warfare Support

Global Navigation Satellite System (GNSS)

Situational Awareness (User)

EW Spectrum Awareness



## Electronic Protection

GNSS Signal Integrity

GNSS Signal Monitoring

## Electronic Attack

*Classified*

**The APNT CFT will develop an overarching Army NAVWAR strategy that will protect Soldier ability to shoot, move, and communicate during electronic acts and deny the GNSS electromagnetic spectrum to our adversaries**