Information Dominance
Anytime, Anywhere…
Overview

• Mission/Vision/Organization
• Major Programs & Focus Areas
• Future Projects/Industry Opportunities
• Science & Technology Interests
• Summary
PMW/A 170 MISSION:
To acquire, integrate, deliver and support interoperable communications, enabling seamless operations for Fleet, Joint and Coalition Warfighters

PMW/A 170 VISION:
To remove communications as a constraint to the Warfighter

PMW/A 170 ORGANIZATIONAL CHART

Program Manager
- Technical Director
- Director of Operations
  - Navigation Principal APM
  - Future SATCOM Principal APM
  - SATCOM Principal APM
  - Tactical Comms Principal APM

Deputy Program Manager
- Business Financial Manager
Major Programs & Focus Areas
Major Programs
PMW/A 170

SATELLITE COMMUNICATIONS (SATCOM)
- Commercial Wideband Satellite Program (CWSP)
- International Maritime Satellite (INMARSAT)
- Commercial Broadband Satellite Program (CBSP)
- TV Direct to Sailors (TV-DTS)
- Enhanced Mobile Satellite Service (EMSS) Iridium
- Super High Frequency (SHF)
- Global Broadcast Service (GBS)
- Navy Extremely High Frequency SATCOM Program (NESP)
- UHF SATCOM (Legacy)
- Navy Multiband Terminal (NMT)
- Navy Transformational Communications (NTC)
- Joint Integrated System Technology (JIST Net)

TACTICAL COMMUNICATIONS
- Battle Force Email (BFEM 66)
- SubNet Relay (SNR)
- High Frequency Internet Protocol (HFIP)
- Digital Wideband Transmission System (DWTS)
- Enhanced Position Location Reporting (EPLRS)
- Shipboard Single Channel Ground and Airborne Radio System (SINCGARS)
- Digital Modular Radio (DMR)
- Switching (TSS, TVS)
- UHF Communications (LOS)
- High Frequency Radio Group (HFRG)
- HF Systems
- Portable Radios

NAVIGATION SYSTEMS (NAVSYS)
- GPS Positioning, Navigation, & Timing Service (G-PNTS)
- GPS Handheld (DAGR & PLGR)
- Navigation Sensor System Interface (NAVSSI)
- Navigation Warfare (NAVWAR)
- Combat Survivor Evader Locator (CSEL)
- AN/WRN-6

COMMON DATA LINK – NAVY (CDL-N)
- Common High Bandwidth Data Link (CHBDL)
- Communications Data Link System (CDLS)

METEOROLOGICAL/OCEANOGRAPHIC (METOC)
- SMQ-11 (Shipboard)
- FMQ-17 (Shore)

GPS: Global Positioning System
DAGR: Defense Advanced GPS Receiver
PLGR: Precision Lightweight GPS Receiver
TSS: Tactical Switch System
TVS: Tactical Variant Switch
PMW/A 170 Delivers

Note: Not a representation of all PMW/A 170 programs/products.
Navy Strategy is to Pursue Integrated MILSATCOM & Commercial Solutions to Meet Global Communication Needs
Tactical Communications Migration

Navy Strategy is to Reduce Radio Variants and Footprint To Meet Tactical Communication Needs

Updated: 7 Nov 07
Navigation Migration

Navy Strategy is to Provide Open, Extensible G-PNTS to All Platforms
# Navy SATCOM Roadmap

<table>
<thead>
<tr>
<th>Platform</th>
<th>Lg</th>
<th>Md</th>
<th>Sm</th>
<th>Subs</th>
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**Updated: 27 Sep 07**

*Acceptable System/Program Status
Marginal System/Program Status
Unacceptable System/Program Status
System/Program Sustainment*
# Tactical Communications Roadmap

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<thead>
<tr>
<th>Platform:</th>
<th>Lg</th>
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Updated: 12 September 2007

Legend:
- Acceptable System/Program Status
- Marginal System/Program Status
- Unacceptable System/Program Status
- System/Program Suspending

**Legend:**
- IOC: Initial Operational Capability
- FOC: Full Operational Capability

**Note:**
- JTRS Inc 1: UHF SATCOM & MUOS WCDMA
- JTRS Inc 2+: Requirements & Funding Are Unknown
# Navy NAVSTAR GPS PNT Roadmap

<table>
<thead>
<tr>
<th>Requirement/Capability</th>
<th>Platform</th>
<th>Air</th>
<th>Surf</th>
<th>Sub</th>
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<td>AN/WRN-6 (3-S)</td>
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<td>Integrated Shipboard Navigation Sensors</td>
<td>NAVSSI Blk 2</td>
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<tr>
<td>Network Capable, Single Frequency Nulling</td>
<td>NAVSSI Blk 3</td>
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<td>NAVSSI Blk 4.2</td>
<td>NAVSSI Blk 4.3</td>
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<tr>
<td>Above + SAASM, dual frequency nulling</td>
<td>NAVSSI Blk 4.3</td>
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<tr>
<td>Above +, Scalable Shipboard PNT Service</td>
<td>Shipboard GPS PNT Service</td>
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<tr>
<td>M-Code Receiver (MAGR2K, EGI, ANAV, other)</td>
<td>Airborne GPS PNT Service</td>
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<tr>
<td>SAASM</td>
<td>MAGR2KS (EGI-S)</td>
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<tr>
<td>All-In-View, Integrity, Modularity</td>
<td>MAGR2K</td>
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<tr>
<td>Field reprogrammable</td>
<td>MAGR</td>
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**Platform**

- **ANW/RN-6 (3-S)**
- **NAVSSI Blk 2**
- **NAVSSI Blk 3**
- **NAVSSI Blk 4.2**
- **NAVSSI Blk 4.3**
- **Shipboard GPS PNT Service**
- **Airborne GPS PNT Service**
- **MAGR2KS (EGI-S)**
- **MAGR2K**
- **MAGR**

**Other Calendar-based Drivers**

- **TSCEI**
- **CANES IOC**
- **JPALS**

**GPS Capabilities:**

- Single Freq. Null
- Dual Freq. Null
- Multi-Beam Steering (DACU/DRM)

**M-Code IOC**

- M-Code

**SAASM**

- GAS-1
- ADAP

**Updated: 28 Jun 07**

**Status Colors:**

- Acceptable System/Program Status
- Marginal System/Program Status
- Unacceptable System/Program Status
- System/Program Sustainment
Future Projects & Industry Opportunities
NTC Future Industry Opportunities

• **Navy Transformational Communications (NTC)**
  - Follow-on to NMT
  - Leverage NMT hardware/software investments to the maximum extent possible
  - Anticipate ACAT IC, M/S B 1QFY13 (tentative)

• **NTC will Implement new capabilities**
  - Single ship downlink rates up to 440 Mbps
  - Terminal/Space based packet communications (IPv6)
  - DBRA, as well as Anti Jam, Anti Scintillation, LPI/LPD
  - Dynamic Network Management
  - XDR+ and XDR waveforms for TSAT, while maintaining: XDR waveforms for AEHF, Enhanced Polar, and wideband WGS

• **Planned Contracts**
  - Conduct a full and open competition with downselect to two vendors for competitive prototype development
  - Downselect to single vendor for development of 20 EDMs
    - Develop new TSAT-capable NMT Communications Group (CG) (below decks equipment)
NTC Impact on Navy Terminal Suite

**DIGITAL PROCESSING SUBSYSTEM**
- Data Interface Processor
- Terminal Control Processor
- Radio Frequency (RF) Controller
- TRANSEC
- Antenna Control Processor
- MODEM

**RF SUBSYSTEM**
- Synthesizer
- Amplifier
- Low Noise Amplifier (LNA)
- Radome
- Reflector
- Feed
- Pedestal

**Communications Group (CG)**
- Network Access Functions
- Policy Control Functions
- Encryption
- Routing (ADNS)
- Quality of Service (QoS)
- Multiplexing (TIMEPLEX)
- TDMA Interface Processor (TIP)

**ENCLAVE ROUTING TERMINAL**
- Absolutely Affected by TSAT
- Less Impact by TSAT

**SATELLITE**
Common Radio Room (CRR)  
Future Industry Opportunities

PMW 760 has overall cognizance and responsibility for CRR program implementation and development.

PMW 100s

NMT (AEHF)

CBSP

MOS

DMR

Crypto

Note: These systems and interfaces are not all inclusive. They are a representative list of systems that can be automated through C&M solution set.
Science & Technology Interests
Topside Challenges

Reduce antenna size, numbers, and footprint

Reduce EMI/cosite interference

Link speed and reliability directly tied to signal to noise ratio

Commercial SATCOM lives in a **very** tough environment shipboard
PMW 170 S&T Interests

*Improved Multi-function, Multi-band, High Bandwidth Apertures*

- Electrically short, high efficiency, HF broadband transmit antenna
  MCCP Program

- Multi-band T/R apertures for simultaneous waveforms (2MHz-50GHz)
  RF TAP (Trans. Ant. Panels)

- Integrated Topside Program

**TRL – Technology Readiness Level**

- TRL 6
- TRL 5
- TRL 2

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PMW 170 S&T Interests
SATCOM Throughput Improvements

Metamaterials for antenna reflectors to increase gain/reduce sidelobes

Very linear power amps for phase and amplitude modulation

LNA noise figure improvement
*Cryogenic cooled*
*Digital RF front-end*

Improve output control of EHF power amps to meet TSAT specs

**TRL** – Technology Readiness Level

Improve (SATCOM) transmit power amp efficiency
*Reduced radome heating*
*Higher MTBF*
Navy is in process of establishing throughput requirements in a jammed SATCOM environment.
Summary

• Continue framework to pursue opportunities for PMW/A-170 and Industry to accelerate development and insert technologies
  ➢ Alignment with PEO-C4I roadmaps
  ➢ xxx

• Continue to pursue and identify specific opportunities for technological improvement in areas of need for PMW/A-170
  ➢ Integrated Topside, RF-TAP, Adv. RF Distribution System…

• Continue to team with Industry on on-going Commercial SATCOM efforts
Program Office Point of Contact

• POC for Industry Opportunities
  ➢ Director of Operations (PMW/A170)
  ➢ Phone: (619) 524-7760

• Next PMW/A 170 Interchange Meeting:
  ➢ SPAWAR Industry Executive Network (SIEN)
  ➢ San Diego, 23 June
Questions?