Space and Missile Systems Center

Military GPS User Equipment (MGUE)

Lt Col James “Mutt” Wilson
Program Manager
29 Apr 15

Information contained in this briefing cannot be construed as contractual direction
### Military GPS User Equipment (MGUE)

**7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)**

Air Force Space Command, Space and Missile Systems Center, Los Angeles AFB, El Segundo, CA, 90245

**12. DISTRIBUTION/AVAILABILITY STATEMENT**

Approved for public release; distribution unlimited

**13. SUPPLEMENTARY NOTES**

Presented at the GPS Partnership Council 2015 (GPSPC15), held April 29 to May 1, 2015, at the Los Angeles AFB, CA.
Overview

- MGUE Acquisition Strategy
- MGUE Increment 1 (Inc 1) Schedule
- MGUE Inc 1 Test Plan
- MGUE Increment 2 (Inc 2) Plan
- M-Code Receiver Statistics
MGUE Program Summary

• Incremental Acquisition effort to develop form factors
  – Increment 1 (Inc 1): Ground (GB-GRAM-M) and Aviation/Maritime (GRAM-S/M)
  – Inc 1 form factors evaluated to be at high level of maturity

• Responded to Acquisition Decision Memorandum 20 Feb 14
  – Direction from USD(AT&L) to accelerate MGUE Increment 1
  – Pulled forward items from EMD phase and proceeding to MS B/C
  – Updated Acquisition Strategy Document, signed 10 Apr 15

• Requirements approved by JROC on 24 Jul 14

• Integrate Inc 1 form factors into service-nominated lead platforms
  – Ground: DAGR Distributed Device (D3) and Joint Light Tactical Vehicle (JLTV)
  – Air: B-2
  – Maritime: Arleigh Burke Class Missile Destroyer
• A commercial market driven acquisition approach
• Accelerating from TD phase to production

Incremental acquisition strategy sets basis for future
MGUE Test Strategy:
Path to Operational Test in FY16

MGUE Maturity
MGUE Circuit Card

MGUE Receiver Prototypes

Technical Requirements Document

Interface Control Document

Red Flag

Gypsy Juliet

Demonstrations

T-38

Card level testing and prototype demonstration

Lead Platform Program Offices

Hardware in The Loop

Prototype Box Testing

PRTAs

Goal: reduce risk of discovery during operational test

Operational Relevant Environment

Ready for OT FY16

PEO Certification

Platform Integration

OT

PRTA: Production Representative Test Articles
OT: Operational Test

Crawl
Walk
Run
Sprint
MGUE Performance: NavFest 2015

- Utilized C-12J to showcase MGUE capabilities
  - More mature hardware/software than Red Flag
  - Additional early integration of B-2 receiver
  - Able to track M-Code in jamming environment
- Test Successful – MGUE card held lock!
  - M-Code tracked in both contested & benign environments
MGUE Inc 2 Current Status

• JCIDS: Inc 2 Capabilities Development Document (CDD) in coordination
  – AFROC approved Draft CDD
  – Defines 3 items:
    • Precision Guided Munitions (PGM)
    • Space Receiver
    • Handheld (HH)

• PPBE: FY16 PB adds MGUE Inc 2
  – Starts in FY17, accelerating two years from FY19 start
Inc 2 Acceleration: Ongoing Efforts to Leverage Inc 1

Space and Missile Systems Center

- Possible Materiel solutions exists for 2 of 3 Inc 2 Platforms
  - Teaming with Army to integrate Increment 1 (Inc 1) technology into Precision Guided Munitions (PGM)
    - Analysis indicates Inc 1 technology can withstand PG environments
  - AF developing low size/weight/power GPS M-Code space receiver
    - Completed Preliminary Design Reviews – Mar 2015

- Potential materiel solution for third platform
  - Investigating NDI to meet Handheld requirements
MGUE Inc 2: Handheld Acceleration

- Continue accelerated commercial market driven approach by using existing Handheld with MGUE Inc 1 receiver
- Inc 2 requires handheld as an end item
- Opportunity to leverage Inc 1 efforts to handheld application
- USAF conducting market research of handheld vendors with potential to integrate MGUE Inc 1 ASIC into an existing product
- Seeking approval to pursue handheld as a non-developmental item
History of GPS User Equipment Development at SMC

Small Lightweight GPS Receiver (SLGR)

Precision Lightweight GPS Receiver (PLGR)

Defense Advanced GPS Receiver (DAGR)

Ground Based-GPS Receiver Application Module (GB-GRAM)

180,000 units, Bosnia and OIF

500,000 units, since 2005

100,000 units, since 2005

MGUE Next Step in Long History
## User Equipment Fielding vs Availability

### SAASM Receivers Processed

<table>
<thead>
<tr>
<th>User Equipment</th>
<th>Quantity in the field</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAGR (SAASM)</td>
<td>500,000+</td>
</tr>
<tr>
<td>GB-GRAM (SAASM)</td>
<td>100,000+</td>
</tr>
<tr>
<td>Projected M-Code Receivers (FY17-FY30)</td>
<td>~1.5M+</td>
</tr>
</tbody>
</table>

### M-Code receiver demand expected to increase with availability

DAGR: Defense Advanced GPS Receiver  
GB-GRAM: Ground-Based GPS Receiver Application Module  
SAASM: Selective Availability Anti-Spoofing Module
Summary

- MGUE is an incremental acquisition approach
- MGUE is operating on time
- MGUE Inc 1 accelerating to production
- MGUE Increment 2 will be a pre-planned product improvement
- M-Code is the way forward for GPS receivers