Next Generation Jammer (NGJ) Overview

March 2014

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.
The Next Generation Jammer (NGJ) system is critical to Airborne Electronic Attack (AEA) and vital for Naval and Joint force power projection.

The capabilities that the NGJ brings to the host platform (EA-18G), Carrier Airwing and Joint forces are needed today and need to be able to outpace the threat in the future.

AEA provides sanctuary by degrading red kill chain, allowing blue kill chain to accomplish the mission.
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• Airborne Electronic Attack (AEA) objectives
• EA-6B sundown, EA-18G transition
• ALQ-99
• NGJ Requirements
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Physical Destruction. “Precision strike” is an increasingly important aspect of physical destruction actions in Joint operations. EW is an important part of precision strike. Frequency management and deconfliction must account for frequencies used by various types of precision strike weapons.
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Electronic Warfare

Offensive
- Electronic Attack (EA)
  - Non-Destructive
    - Electromagnetic Suppression
    - Electromagnetic Deception
    - Directed Energy

Electronic Support (ES)

Electronic Protection (EP)

Defensive
- Destructive
  - Anti-Radiation Missile
  - Directed Energy
## AEA Jamming Required Capability

### Threat Issues Driving Change

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### Tactical Drivers

- Rapid increase of modern threats
- Critical threats are in NGJ range
- NGJ is DoD’s only TACAIR jammer
- IOC est. 2021

**NGJ is Threat Driven**
AEA Objectives
Disrupt, Deny, and Deceive, Confuse

Precision
• Freq Range
• Coherent
• Pointing Accuracy
• Techniques
• EIRP
• Time
• Polarization
**ALQ-99 Tactical Jamming System (TJS)**

**Designed in 1969 and fielded by the Navy in 1971**

- Antenna mechanical steering limitation
- Aging pod with degraded availability, vendor issues & excessive RF fratricide
- EA-18G under-wing aerodynamic environment tougher than EA-6B
- ALQ-99 test equipment is also reaching obsolescence
EA-6B Prowler Transitions to EA-18G Growler

1971 - 2019

Turnover in progress

2010 – 2035…
• NGJ is a Tactical Jamming System (TJS)
• Replaces aging ALQ-99 TJS on the EA-18G
  - EA-18G’s primary offensive airborne electronic attack system
• 2021 IOC for critical Mid-band capability
• Service: DoN
• Threshold Platform: EA-18G
• Entered 25 month Technology Maturation and Risk Reduction Phase on 17 Jan 2014 with contract award to Raytheon
• ACAT Level: ID
• MDA: USD (AT&L)
• CAE: ASN (RDA)
• PEO: RADM Gaddis
• PM: CAPT Bailey
Development Strategy
Increment 1 Mid-band

Technology Maturation Studies
- Completed 4/13
  - Subsystem level maturation of key technologies
    - Prototyping & Maturation of Subsystems
    - Design and documentation of a system level Concept Demonstrator

Technology Maturation and Risk Reduction (TMRR)
- Awarded 7/13 & 1/14
  - System level prototyping & test
    - Concept Demonstrator (TRLs)
    - Lab and contractor flight testing
  - System level design through PDR
    - System Requirements Review, System Functional Review, Preliminary Design Review

Engineering Manufacturing and Development (EMD)
- System level design through CDR
- System level testing
- Aircraft Integration
- Test installed system performance

Production & Deployment
- LRIP 1 – Mix of OT and IOC assets
- LRIP 2, 3 & FRP – FOC Assets

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Requirements
NGJ Draft CDD

• Key Performance Parameters (KPPs)
  - Frequency Coverage
  - Effective Isotropic Radiated Power
  - Material Availability
  - Operational Availability
  - Other Mandatory KPPs assumed by the host aircraft
    » Survivability, Force Protection, Net-Ready and Manpower

• Key System Attributes (KSAs)
  - 4 Warfighting KSAs:
    » Number of Assignments
    » Jamming Techniques
    » Spatial Coverage
    » System Weight
  - 3 Sustainment KSAs
    » Material Reliability
    » Ownership Cost
    » System Training

NGJ requirements threat driven

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Unclassified
NGJ is a System

Pods + Integration + Platform

- Comprehensive Airborne Electronic Attack (AEA) Platform
  - Pods – 2 pods / ship set for Inc 1 (Govt. preferred system concept)
  - Platform – EA-18G
  - Integration
    » Hardware – Boeing
    » Software – Government SSA – Advanced Weapons Lab (AWL)
- Inventory objective: 138 pod sets

NGJ is a systems approach to providing AEA capability
NGJ Incremental Approach

Focus is Mid-band IOC and affordability alternatives

- Mid-band (Increment 1)
  - Covers majority of critical threats
  - "Missionizable" due to MOSA
  - Designed to allow swap of mid-band and future high band arrays

- Low band (Increment 2)
  - Current LBT minimizes risk of Inc 2 deferral
  - LBT still in production – last delivery in 2015
  - LBT currently planned to fly with Mid-band (Increment 1)
  - LBT upgrade could be an ECP

- High band (Increment 3)
  - Requires further study of alternative solutions & affordability
  - Mid-band pod missionization provides growth path to High-Band array
  - Allocations support a future High-Band pod and array
Technology Maturation and Risk Reduction Phase Deliverables

• **Increment 1 (Mid-Band) Design to PDR**
  - Establish Functional (SFR) and Allocated (PDR) baselines
    » Robust PDR with all subcontractors participating
    » Substantiate allocations for Size, Weight, & Power
  - Affordability emphasized in Opportunity management process

• **System Level Prototyping and Test**
  - Complete technology risk reduction efforts
  - Demonstrate CTEs in relevant environment (TRL 6 at MS B)

• **Platform Integration**
  - Synchronize Pod development and Platform integration efforts
    » Parallel efforts underway with Platform OEM (Boeing) and Advance Weapons Lab (AWL-China Lake)
  - Established Interface Control Working Group (ICWG)
NGJ Potential Integration Impacts

Blue: Expected Software Impacts Only
Red: Potential for HW Impacts

- **Wiring** (Blanking & Data Network)
- **DMD** (Larger Mission File Sizes)
- **ALQ-218** (Blanking)
- **EAU** (Jammer Mgmt)
- **ALQ-227** (CCS Integration)
- **AMC** (Controls & Displays)
- **SMS** (Store ID & Load Shedding)
- **FCNS** (Advanced Data Network)
- **Pylons** (Blanking & Data Network)
Using NGJ’s New Rhombic Shaped Electrons
Summary

• AEA is a critical requirement for precision strike
• NGJ will replace the ALQ-99 as the leading AEA component
• NGJ will be a more precise weapon system than the ALQ-99 and will be better suited to defeat and pace the threat
Questions