APKWS II
Turning 2.75-Inch Rockets into Precision Guided Munitions
15 May 2012

Chuck Paras
Atkinson Aerospace and Technology Engineering Support
PMA-242
Direct and Time Sensitive Strike Program
APKWS is highly effective weapon that allows aviators to complete their missions while minimizing the risk of harm to allies and non-combatants.
Advanced Precision Kill Weapon System II (APKWS II)

- APKWS is a Semi-Active Laser (SAL) guidance kit added to current 2.75-inch Rockets
  - Manufactured by BAE Systems
- Low collateral damage and minimal aircraft integration
- Accurate: <1 meter CEP in Test Program
- Increased Kills/Sortie: up to 76 per sortie

**Status:**
- Jan 2012 - Completed Operational Testing
- Feb 2012 - Fielding Decision by USMC
- Mar 2012 - Initial Operational Capability
- Full Rate Production Decision 2012

High Precision, Low Collateral Damage Weapon Deployed
APKWS II Weapons System Overview

**LAUNCH PLATFORM**

**Program of Record**
- **Legacy Launchers**
  - USN/USMC - LAU-61/LAU-68

**Joint Capabilities Tech Demo**
- **Legacy Launchers**
  - USN/USMC - LAU-61/LAU-68
  - USAF - LAU-131
  - USA - M260/M261

**LASER SOURCE**
- NTS
- GLD
- FLIR

**APKWS II**
APKWS II System

Shipping and Storage Container, CNU-711/ E (4 WGU-59/ B)

Guidance System, WGU-59/ B

MK 66 Mod 4 Rocket Motor

Fuze    Warhead

Mk 152 HE w/ Mk435 Mod 0 fuze
M151 HE w/ M423 fuze

AUR Length/ Weight: 73.8-inches / 32.8 lbs

Aiming Cues
UH-1Y SCS 7

Fastpack
PA-150 (4 AUR)

7-Tube LAU-68 F/A Launcher

AH-1W, UH-1Y

APKWS HE Impact
APKWS Comparison

WGU-59/ B APKWS II 2.75-Inch Rocket

<table>
<thead>
<tr>
<th>Features</th>
<th>Unguided 2.75-inch</th>
<th>APKWS II</th>
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<tbody>
<tr>
<td>MK-66 Mod 4 RM</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>M151/MK152 WH</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Point Detonating Fuze</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>LAU-61/LAU-68 Launcher</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PA-92 Shipping &amp; Storage Container</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SAL Guidance Section</td>
<td></td>
<td>X</td>
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</tbody>
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Length | 73.8 inches
Weight | 32 lbs
Diameter | 2.792 inches
Longitudinal CG | 41.39 inches
Lateral CG | 0.001 inches

Unguided 2.75 Inch Rocket

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<tr>
<td>LAU-61 D/A or LAU-68 C/A Launcher</td>
<td>55.3 inches</td>
<td>23 lbs</td>
<td>2.792 inches</td>
<td>29.92 inches</td>
<td>0.001 inches</td>
</tr>
</tbody>
</table>

LAU-68 F/A Launcher

LAU-68 D/A or LAU-61 C/A Launcher

CNU-711/C Shipping and Storage Container
APKWS - How it Works

1. DASALSTM Seeker optics receive laser energy from target

2. Seeker electronics convert laser intensity to determine target angle

3. IMU (Atlantic Inertial Systems) senses rocket pitch, yaw & roll

4. Autopilot uses IMU data and seeker data to calculate flaperon positions, which are sent to the Control Actuation System (CAS)

5. CAS moves flaperons to commanded locations and airframe reacts to hit target

DASALSTM is a trademark of BAE Systems, Inc.
APKWS Off Axis Capability

5000 meter shot

3000 meter shot

1400 meter shot

Surface Danger Zone
-1,600 to 12,750 meters (longitudinal)
±8,000 meters (lateral)

Average Miss Distance:
0.44 meters
Concept of Operations
Fixed Wing APKWS J CTD

- Shots & Military Utility Assessment Spring 2013

Air Force A-10C with LAU-131/A and APKWS Instrumented Measurement Vehicles at Eglin AFB

USMC AV-8B with LAU-68F/A and APKWS Instrumented Measurement Vehicles at NAS China Lake

Environmental:
- Wing Slot Seal Modification

Guidance:
- Control Actuation system Modification

Wing Deployment:
- Wing Slot Seal Cracker

Updated for FW APKWS II

Unchanged for FW APKWS II
APKWS II Program of Record Qualification Testing Complete

- **Laboratory/ Ground Tests Summary**
  - Environmental Qualification
  - Adjacent Rocket Fire
  - Hazards of Electromagnetic Radiation to Ordnance
  - Drop Tests – Handling (37”) & Safety (40’)
  - Shipboard Shock
  - Electromagnetic Environmental Effects (E³)
  - Ground Launch at Targets from 1.5 to 5 Km
  - First Article and Lot Acceptance Tests

- **Flight Tests**
  - Captive Carriage & Safe Separation
  - Integrated Flight Tests (IT-B and IT-C)
  - Operational Assessment (OT-B)
  - Initial Operational Test and Evaluation (IOT&E)
Production

- Low Rate Initial Production
  - Lot 1 Delivered
  - Lot 2 in Manufacture
- Full Rate Production
  - In Negotiation
Other Applications

- Same interface as unguided rockets
  - Simple qualification for follow-on platforms

MQ-8B Firescout

Rapid Deployment Capability

AT-6 Texan

Follows Fixed Wing JCTD

F-18 Hornet

Industry Funded Demonstration
Summary

• APKWS II in production
• Units being tested in combat
• Success in combat will inform future plans

Questions?
Contact Info

Charles Paras
Rockets System Engineer
PMA-242-Direct and Time Sensitive Strike Program
301-757-7401
charles.paras.ctr@navy.mil