Remotely Piloted Aircraft in the United States Air Force

Lt Gen Dave Deptula
Deputy Chief of Staff, Intelligence, Surveillance and Reconnaissance
Agenda

- Info-in-war Revolution
- Remotely Piloted Aircraft
- AF RPA Flight Plan
- Domains & Environments...
- America’s Asymmetric Advantage
Evolution of Technology, Information, and Culture Enabled Move from Segregation of Ops and Intel to Integration of Ops and Intel...
Remotely Piloted Aircraft: MQ-1/MQ-9 CAP=168 Total Personnel

Leadership: 2
Admin & Overhead: 14
MX: 4
Pilots: 7
Sensors: 7
Msn Coordinator: 5
Leadership: 2
Admin/Overhead: 14
Other Equip: 1
Ground Station: 1
Satellite Link: 1
Data Terminal: 1

FMV SIGINT: 34
SIGINT: 18
Maintenance: 53
GCS: 1
GDT: 1
PPSL: 1

* Additional CAPs co-located require ~80% less MX, ops/PED personnel remain the same
† Surge numbers, steady state = 10 each
‡ Does not include backshop Personnel
Attributes of Remotely Piloted Aircraft (RPA)

- Persistence - ability to loiter over a target for long time periods for ISR and/or opportunity to strike enemy target
- Undetected penetration / operation
- Operations in dangerous environments
- Can be operated remotely, so fewer personnel in combat zones — projects power without projecting vulnerability
- Integrates “find, fix, finish” sensor and shooter capabilities on one platform
Air Force RPA Vision: Tenets of RPA Evolution

- RPA compelling where the human is a limitation to mission success
- Seamless manned and unmanned systems integration
- Automation is key
- “Integrated Systems” approach
- Modularity = Flexibility
- Robust, agile, redundant C2 enables supervisory control (“man on the loop”)
- Solutions are linked and must be synchronized
...A Joint approach to:

Get the most out of RPA to increase joint warfighting capability, while promoting service interdependency and the wisest use of tax dollars

Requires:

- Optimal Joint Concept of Operations (CONOPS)
- Airspace Control Resulting in Safe / Effective RPA Operations
- Air Defense Architecture to Achieve Security w/o Fratricide
- Acquisition Effectiveness, Efficiency, Standardization
An Air Force with…

- Remotely piloted aircraft fully integrated across the full range of operations
- Automated control and modular “plug-and-play” payloads
- Joint RPA solutions and teaming
- An informed industry and academia – knowing where we are going and what technologies to invest in….

Capabilities-based Air Force RPA vision thru 2047: Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities
Air Force Core Functions
What We Bring to the Fight

- Nuclear Deterrence Ops
- Air Superiority
- Space Superiority
- Cyberspace Superiority
- Command and Control
- Global Integrated ISR
- Global Precision Attack
- Special Operations
- Rapid Global Mobility
- Personnel Recovery
- Agile Combat Support
- Building Partnerships
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<th>Core Functions (Ways)</th>
<th>Capabilities (Means)</th>
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<td><strong>Nuclear Deterrence</strong></td>
<td>Ballistic Missile Defense</td>
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<td><strong>Air Superiority</strong></td>
<td>Electronic Warfare   Suppression of Enemy Air Defenses</td>
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<td>Air-to-Air Superiority</td>
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<td><strong>Space Superiority</strong></td>
<td>Space Force Enhancement  Space Support (including launch support)</td>
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<td>Space Control         Space Force Application</td>
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<td><strong>Cyberspace Superiority</strong></td>
<td>Network Warfare Operations Network Operations</td>
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<td>Influence Operations Space Control (Negation)</td>
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<td><strong>Command and Control</strong></td>
<td>Connectivity Information Integration</td>
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<td>Theater Planning &amp; Execution</td>
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<td><strong>Global Integrated ISR</strong></td>
<td>Collection Plan &amp; Direct ISR Activities</td>
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<td>Process and Exploitation Dissemination</td>
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<tr>
<td><strong>Global Precision Attack</strong></td>
<td>Close Controlled Strike Long Range Strike</td>
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<td>Intra-theater Strike</td>
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<tr>
<td><strong>Special Operations</strong></td>
<td>Specialized ISR Aviation FID</td>
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<td>Specialized Aerospace Fires Information Operations</td>
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<tr>
<td><strong>Rapid Global Mobility</strong></td>
<td>Airlift Air Refueling</td>
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<td><strong>Combat Search and Rescue</strong></td>
<td>Humanitarian Assistance Ops CSAR</td>
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<td>Disaster Response</td>
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<td><strong>Agile Combat Support</strong></td>
<td>Employing the Force Positioning the Force</td>
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<td>Sustaining the Force Preparing the Battlespace</td>
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<td><strong>Building Partnerships</strong></td>
<td>Strengthen Relationships Assess</td>
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<td>Train, Advise, Assist Obtain Support for US Interests</td>
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**Legend**
- Currently Supporting
- Near-term shortfalls
- Long-term potential
AF RPA Flight Plan: Mission sets for RPA

Current Capability Shortfalls

**NANO/MICRO**
- WASP III
- Raven
- Scan Eagle

**Small**
- MQ-1B
- MQ-9

**Medium “fighter size”**
- EO/IR/SAR
- RQ-4 Blk 10/20
- RQ-4 Blk 30

**Large “tanker size”**
- RQ-4 Blk 40
- +ASIP

**Special RPA**
- MP-RTIP
- RQ-4 Blk 40

**EA GAP**
- Nano
- Family of Transformers
- NextGen – Multi-Mission
- Tier II STUAS
- Air-Launched SUAS

**Fighter Recap**
- EA/ISR/CAS
- SEAD/AAR-T
- Counterair, Missile Defense
- Low Observable
- ISR/EA
- Interoperable RPA C2
- High Altitude Long Endurance
- Low Observable

**Indoor recon, indoor lethal/non-lethal, indoor comm, cyber attack, Swarming**
- Personal ISR, Lethal, SIGINT, Cyber/EW, Counter RPA, Auto-sentry
- ISR, Comm Relay, Lethal/Non-lethal, Cyber/EW, SEAD, SIGINT, Low Altitude Pseudo-Sats
- ISR, Comm Relay, Lethal, SIGINT
- Close-in ISR, Lethal, SIGINT/DF

**Special RPA**
- NANO/MICRO
- Small
- Medium “fighter size”
- Large “tanker size”

**AF RPA Flight Plan**
- Mission sets for RPA
AF RPA Flight Plan: Small “Family of Systems”

Nano
Navigate / communicate inside buildings

Micro
Close-in reconnaissance & situational awareness

Man-portable
- ISR
- Time-Sensitive
- Lethal

Air-Launched
- Close-in ISR
- Lethal
- SIGINT/DF

Multi-Mission
- ISR
- Force protection
- FID

Irregular Warfare

Raven B
Increasing across all mission sets

Switchblade SUAS
Technical Demonstration

Anti-Access Support

Finder SUAS
Technical Demonstration

Voyeur SUAS
Technical Demonstration

Tier II Joint
- ISR
- Comm Relay
- Lethal
- SIGINT

Next Gen Multi-Mission
- ISR
- Communications Relay
- Lethal / Non-lethal
- Electronic/Cyber Attack/SEAD
- SIGINT/Low Altitude Pseudo-Sats
- New Mission areas

Now

Future

Bio-Mechanicals
- Indoor Reconnaissance
- Indoor Lethal/Non-lethal
- Indoor Comm
- Cyber attack
- Swarming

“SUAS Family of Transformers”
- Personal ISR
- Lethal
- SIGINT
- Cyber/EW
- Counter-UAV
- AutoSentries

Family of Expendables
- Close-In ISR
- Expendable Jammers
- Lethal
- Counter Air
- Precision Clandestine Resupply
- Cyber attack

Irregular Warfare

Gremlin
Anti-Access Support

Increasing across all mission sets

GT Aero
Conceptual Bandit SUAS

Lite Machines
Conceptual SUAS
AF RPA Flight Plan: Medium Systems

MQ-1
- Collection – SIGINT/FMV

MQ-9
- Collection – SIGINT/FMV
- Wide Area Airborne ISR
- CAS

MQ-Xa
- Collection
- SIGINT/FMV
- Wide Area Airborne ISR
- SAR/GMTI
- CAS

MQ-Xb
- Collection
- Specialized ISR
- AAR-R

MQ-Xc
- Collection
- Specialized ISR
- AAR-R&T
- SEAD
- Air Interdiction
- Counter Air
- CSAR
- Missile Defense
- Strategic Attack

Modular Payloads
- EW
- ISR
- CAS
- Comm Relay
- Collection
- Dissemination
- Specialized ISR
- AAR-R

Modular Payloads
- EW/ISR
- CAS
- Comm Relay
- Collection
- Dissemination
- Specialized ISR
- AAR-R&T
- SEAD
- Air Interdiction
- Counter Air
- CSAR
- Missile Defense
- Strategic Attack

Now
Future
AF RPA Flight Plan: Large Systems

RQ-4 (Blk 20/30/40)
- Collection:
  - Block 20
    - Enh SAR
    - Enh EO/IR
    - BACN
  - Block 30
    - Adv SIGINT
  - Block 40
    - MP-RTIP Radar
    - GMTI and concurrent SAR
    - High Range Resolution
    - No EO/IR or SIGINT

RQ-4 (Blk 10)
- Collection – ISR
  - Basic SAR
  - Basic EO/IR

MQ-Lc
- Modular Payloads
  - EW
  - ISR
  - Command and Control
  - Airborne Moving Target Indicator
  - Ground Moving Target Indicator
  - Information Integration
  - AAR-R & T
  - Airlift

MQ-Lb
- Modular Payloads
  - EW
  - ISR
  - Command and Control
  - Airborne Moving Target Indicator
  - Ground Moving Target Indicator
  - Information Integration
  - AAR-R & T
  - Airlift

MQ-La
- Modular Payloads
  - EW
  - ISR
  - Command and Control
  - Airborne Moving Target Indicator
  - Ground Moving Target Indicator
  - Information Integration
  - AAR-R

Now

Future

U.S. AIR FORCE

Integrity - Service - Excellence
Foundation: Modularity

- Multi-mission modules
- Mission drives payload

Open architectures

- Airframe, Sensors, Payloads
- “On-Demand” on any network

High subsonic dash

Greater endurance

Ability to operate in a contested environment
Sensor technology rapidly expanding ISR capacity

Analysis and exploitation tools need to keep pace with sensor development and deployment

Swimming in Sensors...
Need to Avoid Drowning in Data...
MQ-1:
Observe single target
Single ROVER / OSRVT

MQ-9:
Wide area coverage area
10-12 independent ROVER queries
and potentially 50-60 clips through the GORGON STARE ground station

Increment 1
Gorgon Stare

Increment 2
Gorgon Stare

21st Century Challenges:
Dealing With Data Growth

Today
IOC 3rd Qtr FY10

Delivers 1st Qtr FY12
Why “CAPs” Should Not be Used as a Measure of ISR Sufficiency

- Increment 1: GORGON STARE
- Increment 2: GORGON STARE

Graph showing motion imagery spots from FY08 to FY16:
- MQ-1/9 only "spot" numbers without WAAS
- MQ-1/9 "spot" nums with all MQ-9 WAAS enabled fleet

CAPs:
- FY08: 34 CAPs
- FY09: 39 CAPs
- FY10: 49 CAPs
- FY11: 50 CAPs
- FY12: 62 CAPs
- FY13: 65 CAPs
- FY14: 68 CAPs
- FY15: 70 CAPs
- FY16: 72 CAPs
How to Get the Most ISR Soonest: Focus on “Output” Instead of “Input”

- WAAS Program Of record
- MQ-1/9 FMV only
- Additional MQ-1/9 FMV only
- MQ-9 with WAAS/GCS

Motion Imagery Spots

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<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
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<tr>
<td>36 CAPs</td>
<td>44 CAPs</td>
<td>59 CAPs</td>
<td>50/62 CAPs</td>
<td>50/65 CAPs</td>
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Domains & Environments: A cautionary note...

REGULAR

IRREGULAR

AIR
SPACE
CYBERSPACE
GROUND
MARITIME

CATASTROPHIC

DISRUPTIVE
Domains & Environments: A cautionary note...

PERMISSIVE

CONTESTED

DENIED

AIR
SPACE
CYBERSPACE
GROUND
MARITIME
America’s Asymmetric Advantage…
Operations From the Third Dimension

“Tanks And Armor Are Not a Big Deal...The Planes Are The Killers. I Can Handle Everything But The Jet Fighters....”
“The drones are very effective...”

- Taliban Field Commanders

Does our asymmetric advantage offer alternatives to long-term, large resource investment and personnel presence?
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