Air Force Unmanned Aerial System (UAS) Flight Plan 2009-2047

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### Air Force Unmanned Aerial System (UAS) Flight Plan 2009-2047

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**Standard Form 298 (Rev. 8-98)**
Prepared by ANSI Bal Z39-18
AF ISR Transformation

- New challenges, new adversaries mandate new role for ISR
  - Collectively necessitated **AF ISR Transformation**
  - Expanded role and reach of AF ISR
  - Requires changing the culture regarding ISR

- Approach:
  - **ORGANIZATION:** Organize AF ISR as a holistic AF-wide enterprise to optimize presentation of ISR capabilities to service, joint, & national users
  - **PERSONNEL:** Develop ISR career paths to build viable “bench” of AF ISR senior leaders to meet 21st Century demands
  - **CAPABILITY:** Plan, guide, and orchestrate AF/ISR from a capability-based perspective as a consolidated functional area
1) **AF ISR Strategy**: AF ISR’s long-range plan that provides overall guidance and philosophy

2) **AF ISR Flight Plan**: Identifies options to resource the AF ISR strategy

3) **AF UAS Flight Plan**: Action plan to guide AF UAS development

4) **ISR CONOPs**: Describes how we envision integrating and optimizing ISR day-to-day operations
What do UAS’s Bring to Operations?

- Persistence—ability to loiter over a target for long time periods for ISR and/or opportunity to strike enemy target
- Undetected penetration / operation
- Operation 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
Growth in Air Force medium-altitude MQ-1 Predator and MQ-9 Reaper Combat Air Patrols

- 2004 = 5
- 2005 = 8
- 2006 = 11
- 2007 = 18
- 2008 = 33
- 2009 = 38

660% Increase in 6 years!
...A Joint approach to:

Get the **most** out of UAS 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 UAS Operations
- Air Defense Architecture to Achieve Security w/o Fratricide
- Increased Acquisition Effectiveness, Efficiency, Standardization
An Air Force with...

- Unmanned aircraft that are fully integrated with manned aircraft across the full range of military operations
- UAS that use automated control and modular “plug-and-play” payloads to maximize combat capability, flexibility and efficiency
- Joint UAS solutions and teaming
- An informed industry and academia – knowing where we are going and what technologies to invest in

**Capabilities-based Air Force UAS vision thru 2047:**
Defines DOTMLPF way forward
AF UAS Flight Plan
2009-2047

Colonel Eric Mathewson
AF UAS Task Force
Assumptions

- Manned and unmanned systems must be integrated to increase capability across the full range of military operations for the Joint Force
- UAS compelling where the human is a limitation to mission success
- Automation is key to increasing effects, while potentially reducing cost, forward footprint and risk
- The desired effect is a product of the “integrated system” (payload, network, and PED); and less the particular platform (truck)
- Modular systems with standardized interfaces enhance adaptability, sustainability and reduce cost
- Robust, agile, redundant C2 enables supervisory control (“man on the loop”)
- DOTMLPF-P solutions are linked and must be synchronized
**Conventional Harbor**

- 4 operators per crane
- Manpower-centric system
  - Legacy system
  - Manpower dependant
  - Manual Operation

**“Multi-Crane Control”**

- 1 operator per 6 cranes
- 24x increase in efficiency
- Tech-centric system
  - Multi-crane Control
  - Automation (cranes and AGV)
    - DGPS
    - Algorithms

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**Autonomy**

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**Integrity - Service - Excellence**
Autonomy – Multi-Aircraft Control
Potential Manpower Savings

2011 (Current system)
- 50 CAPs
  - 50 MQ-9 CAPs
  - + 7 a/c in constant transit
- 10 pilots per CAP
  - 500 pilots required
  - + 70 pilots to transit a/c
  
  570 Total Pilots

2012 (MAC)
- 50 CAPs
  - 50 MQ-9 CAPs
  - 2 CAPs per MAC GCS
  - 1 transit per MAC GCS
- 5 pilots per CAP
  - 250 Pilots required
  - + 0 to transit aircraft
  
  250 Total Pilots

TBD (MAC + 50% auto)
- 50 CAPs
  - 50 MQ-9 CAPs on orbit
  - 25 CAPs automated
  - 25 CAPs in MAC (5 pilots/CAP)
  - 125 pilots required
  - + 25 auto-msn monitor pilots
  - + 0 to transit aircraft

  150 Total Pilots

64% Manpower Savings

MAC = 1 pilot can fly up to 4 a/c
**Modularity**

**Effective**
- B-52
  - Standard Interfaces
  - Variable / Tailorable armament set
  - JFC Mission Flexibility
    - Conventional/nuclear
    - Stand-off strike, CAS

**Affordable**
- PCs
  - Standard interface/bus
  - Swappable components
  - Promotes vendor competition
  - Drives down price, improves quality, allows for tailorability
  - $399 PCs are reality

**Flexible**
- C-130
  - One platform/truck
  - Supports multiple missions
  - Swappable modules
Enabling the “Global” in “Global Vigilance, Reach and Power!”

AMC-X CONCEPT
CAPABILITIES STUDY

Common components, similar shape, and same production line

Multi-Mission Aircraft

Notional Examples

- Mobility
- Long Range Strike
- Air Refueler

Common Platforms
Common R&D

PSAS
M-X
KC-X
AMC-X
How do we get there?

- Methodology
  - Identified where we are today
  - Examined future scenarios and desired capabilities
  - From that future perspective identified actions to get there from today
  - Matched compelling requirements to UAS capabilities aligned with AF Core Functions
  - Identified and sequenced actions addressing not only materiel solutions, but also the doctrine, organization, training, facilities and policy
AF UAS Flight Plan: Mission sets for UAS
SUAS "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**
- Increasing across all mission sets
- Raven B
- Switchblade SUAS
- Anti-Access Support

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

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

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

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Now Future

Integrity - Service - Excellence
Medium “System”

MQ-1
- Collection – SIGINT/FMV
- CAS

MQ-9
- Collection – SIGINT/FMV
- CAS

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

MQ-Xa
- Collection
- SIGINT/FMV
- Comm Relay
- Dissemination
- Specialized ISR
- AAR-R

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

MQ-Xc
- EW/ISR
- CAS
- Comm Relay
- Collection
- Dissemination
- Specialized ISR
- AAR-R & T
- SEAD
- Air Interdiction
- CSAR
- Strategic Attack

Modular Payloads

Now

Future

I n t e g r i t y - S e r v i c e - E x c e l l e n c e
Large “System”

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

MQ-La
- Collection – ISR
- Basic SAR
- Basic EO/IR

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

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

Modular Payloads
- Humanitarian Assistance
- Strategic Attack
- Global Strike
- CAS
- Air Mobility
- Airlift

Now

Future

Integrity - Service - Excellence
Connectivity and Teaming
Future

MQ-LE
Collection/Info Ops
Connectivity

MQ-Ls
EW/Collection/Info Ops
CAS/Air Interdiction/Airlift

MQ-L
Collection/Info Ops
(AWACS/JSTARS)

MQ-Hyper Sonic
Strategic Attack/Prompt Global Strike

B-2/MQ-L Teaming
Strategic Attack/
CAS/Air Interdiction
Kinetic & Non-kinetic Wpns

MQ-L – JSF/MQ-X
Aerial Refueling/
Connectivity

F-22/MQ-X Teaming
Counterair/Missile Defense
Kinetic & Non-kinetic Wpns

JSF/Multi Msn MQ-X Teaming
Air Interdiction, CAS --
Kinetic & Non-kinetic Wpns

Multi Msn MQ-L/X, SUAS - FOS Teaming
ISR/EW/SEAD – Kinetic & Non-kinetic Wpns

Network

NAT'L (JCS,
NSA, NGA,
DIA, etc.)

JTF HQ, CAOC
MCEs, DCGS

SOF, ALO, TAC-P

Integrity - Service - Excellence
Action Synchronization

**Doctrinal**
- Near-term FY09-10
  - CDR allocation
- Mid-term FY10-15
  - J2/J3
- Long-term FY15-25
  - Auto Tgt Engage
  - Autonomous Fight

**Organization**
- Near-term FY09-10
  - SUAS Sqdn
  - MAC Ops MAC Logistics Sqdn
- Mid-term FY10-15
  - Auto OPS Sqdn
  - Auto Flight
- Long-term FY15-25
  - Autonomous Fight

**Training**
- Near-term FY09-10
  - UAS Beta Test
  - 100% Sim Training
  - Common GCS
  - ASSURED Comm
- Mid-term FY10-15
  - Auto OPS Sqdn
  - Auto Flight
- Long-term FY15-25
  - Autonomous Fight

**Materiel**
- Near-term FY09-10
  - MAC Auto T/O
  - T/O Sim
  - Land
  - ECSS
  - UAS AFSC
  - CBM+
- Mid-term FY10-15
  - Autonomous Fight
  - Swarming Alt Energy
  - Auto MX
- Long-term FY15-25
  - Auto MX

**Leadership**
- Near-term FY09-10
  - CC’s
  - SAF/PA Outreach
  - PME
  - Career Pyramids
- Mid-term FY10-15
  - Command of Autonomy
  - Bldg the “New” AF Leader
- Long-term FY25-47
  - Bldg the “New” AF Leader

**Personnel**
- Near-term FY09-10
  - Rated
  - SUAS Operator
  - UAS LNOs
  - Recruiting Focus
  - Teaming w/ Schools
- Mid-term FY10-15
  - Force Structure Reform
- Long-term FY25-47
  - Force Structure Reform

**Facilities**
- Near-term FY09-10
  - C2 Facility
  - CFACC Facility
- MPR
- Long-term FY25-47
  - Auto MX Facilities

**Policy**
- Near-term FY09-10
  - NAS
  - ILAs
  - Acq Excellence
  - MAC-in-NAS
- Mid-term FY10-15
  - Treaties
  - Autonomy
- Long-term FY25-47
  - Auto Tgt Engage

**Integrity - Service - Excellence**
AF UAS Flight Plan Vision

- An Air Force where unmanned aircraft systems are considered as viable alternatives to traditionally manned platforms

- An Air Force that harnesses increasingly automated, modular and sustainable systems resulting in a leaner, more adaptable, tailorable, and efficient force that maximizes combat capabilities to the Joint Force

- An Air Force that teams with the other Services, our allies, academia and industry to capitalize on the unique unmanned aircraft attributes of persistence, connectivity, flexibility, autonomy, and efficiency
AF UAS Flight Plan
2009-2047

Colonel Eric Mathewson
AF UAS Task Force