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Original title on 712 A/B: Manpower Requirements Determination for New Programs: A Structured Approach – BAMS UAV

Revised title: Manpower Requirements Determination for New Programs: A Structured Approach – BAMS UAV

Presented in: WG 20

This presentation is believed to be:
UNCLASSIFIED AND APPROVED FOR PUBLIC RELEASE
**Manpower Requirements Determination for New Systems Broad Area Maritime Surveillance (BAMS)Unmanned Aerial Vehicle (UAV)**

**Whitney, Bradley & Brown, Inc. 1604 Spring Hill Road, Suite 200 Vienna, Virginia 22182**

Manpower Requirements Determination for New Systems

Broad Area Maritime Surveillance (BAMS)
Unmanned Aerial Vehicle (UAV)

73rd MORSS Conference
WG 20
23 June 2005

Prepared by:
Whitney, Bradley & Brown, Inc.
1604 Spring Hill Road, Suite 200
Vienna, Virginia 22182 -- (703) 448-6081
Overview

- Tasks and general approach
- Manpower ConOps development
- Manpower requirements determination
- Manpower drivers
- Manpower requirements
- Lessons Learned
The Challenge

BAMS UAV Concept of Operations:
• High altitude (above 40K), Long dwell (over 24 hrs), autonomous
• Persistent, forward deployed ISR (5 x 24/7/365)

Traditional Approach
• Current system upgrade or new system replacing old
• Specific vehicle/system
• ROC/POE
• Workload metrics available (maintenance & Human Systems)
• Predominately Military (Active & Reserve) manning

BAMS UAV
• Completely new system – no Baseline Comparison System
• Vehicle not selected
• No ROC/POE
• No maintenance or HS data
• Guidance:
  - Total Force approach
  - Sea Warrior / TF Excel context
  - Optimum manning to reduce total numbers and life cycle cost
  - No end strength growth
  - Stakeholder concurrence on requirement on manpower conops and requirement
BAMS UAV Manpower
Plan of Attack

Task: Go from blank sheet of paper to detailed manning document in 8 months -
• Develop Manpower Concept of Operation (build Fleet consensus)
• Determine Manpower and Personnel requirements
• Articulate results in Manpower Estimate Report (MER) – Milestone B requirement

1. Operational CONOPS
   - Fleet and OPNAV approved ConOps identified constraints on manpower concept

2. Manpower CONOPS
   - Identify key manpower drivers
   - Develop manpower ConOps feasibility space
   - Consider fixed number of ConOps alternatives
   - Apply metrics and analysis
   - Build Fleet consensus for final ConOps Alternative

3. Manpower Analysis
   - Coordinate with N-12/NAVMAC
   - Employ defendable and agreed-to methodology

4. MER
   - Follow approved format, coordinate with POCs
   - Address all critical issues
   - Final document details final recommendation
BAMS Manpower ConOps Approach

- **Identify key Manpower ConOps variables**
  - Enough generality to capture only the major MPT drivers
  - Enough resolution to build Manpower ConOps alternatives

- **Get Fleet and Stakeholder input early**
  - 11 “variables” considered
  - 3 “options” within each variable
  - 177,147 potential “alternatives” available for consideration

<table>
<thead>
<tr>
<th>Organization</th>
<th>Air Vehicle</th>
<th>Capability Package</th>
<th>Force Structure</th>
<th>OPS Support Concept</th>
<th>Maintenance Support Concept</th>
<th>Support Concept</th>
<th>Community Ownership</th>
<th>TSC Capability</th>
<th>Number of Bases</th>
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**Variables**
**BAMS Manpower ConOps Development Methodology**

**ConOps Steps:**

1. Identify manpower variables and options
2. Apply constraints – eliminate infeasible variables and options
3. Neck down pathways by identifying manpower themes that “cover the waterfront”
4. Select alternatives for detailed analysis

**Variables**

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<th>Organization</th>
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**Assessment Methodology**

- **Prioritized Criteria:**
  - Manpower High
  - Manpower Low
  - UAV Centric
  - Transformational

- **Operation:**
  - Operations
  - Training
  - Manpower
  - Personnel
  - Cost
  - External Impacts

- **Best alternative recommended as MER input**

**Alternatives**

1. 177,147 Alternatives
2. 7776 Alternatives
3. 18 Alternatives

**Adequately cover the trade space**
Manning ConOps Alternative “Paths”

- 5 chosen alternatives “bracketed” trade space
- Evenly distributed across variable “options”

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<td>L &amp; R</td>
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- **Manpower High:** Highest Manpower requirement
- **Manpower Low:** Lowest Manpower requirement
- **Middle Ground:** Between High and Low Manpower requirements
- **UAV Centric:** Most acceptable from a UAV community perspective
- **Transformational:** Supports DoD Transformation concept
Cost Effective Combat Capability

Overall Objective
Weight Objectives
Weight Decision Criteria
Alternatives

9 criteria x 5 alternatives x 3 scenarios = **135 Assessments**
Assessment Model Weighting

1. Evaluated alternatives using the Analytic Hierarchy Process (AHP)
2. Alternatives rated over several *weighted* criteria
3. Resulting “scores” reflect alternative value from *two* aspects
   • Operational value and Support (MP cost) value
4. Allowed selection of a single alternative to proceed to MER
• From a “balanced” perspective, two alternatives break out
  • Middle Ground & Transformational

• Both had significant value from both an Operational and Manpower perspective
Using weights from the AHP model, LP was used to determine optimum manpower conops variable options …
# Final Manpower ConOps

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<td>Other</td>
<td>L &amp; R</td>
<td>7</td>
<td>None</td>
</tr>
</tbody>
</table>

- 5 vehicles / 2 MCS per site / 1 vehicle airborne 24 / 7 / 365
- Limited surge: FOV ops
- 8 crews per site:
  - 2 UAV pilots
  - 2 Sensos
  - 1 IS
  - IFTs on duty 24/7 (Data link & UAV ground systems)
- 8-hr watches, 6hr missions, 2hr overlap, officers are DHs/DivO’s
  - Mission crews handle mission planning
- Shore duty
  - NAVMAC policy: 33.4hr standard workweek for military
- FRS training done at CONUS squadron
- Maintenance supervisory training done at factory
- No unique maintenance skill sets required – no unique training
- 7 civilians = 10 active duty
  - NAVMAC and NAVAIR policy
- Reserves not directly addressed
Analysis Methodology

1. Started with USAF Global Hawk manpower requirement
   - GH MER
   - Current GH “SQMD” and operational experience

2. Translated AF manpower ratings & designators into USN
   - Adjusted for USN/USAF differences in operational and manpower ConOps

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<th>USAF GH Current</th>
<th>USN BAMS UAV</th>
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<td>Vehicles/MCS per site</td>
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<td>4/1</td>
<td>5/2</td>
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<td>OPTEMPO</td>
<td>24/7 at 3 sites (wartime)</td>
<td>24/7 at 3 sites (wartime)</td>
<td>24/7 at 5 sites continuous</td>
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<tr>
<td>Exploitation</td>
<td>Centralized</td>
<td>Centralized</td>
<td>Limited onsite capability</td>
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<table>
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<td>Individual MOEs/Ratings</td>
<td>7 Officer / 33 Enlisted</td>
<td>7 Officer / 28 Enlisted</td>
<td>4 Officer / 15 Enlisted</td>
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<tr>
<td>Active/Civilian Mix</td>
<td>4.5%</td>
<td>4.1%</td>
<td>76.0%</td>
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<tr>
<td>Total Program Requirement</td>
<td>1,772</td>
<td>998</td>
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</tr>
</tbody>
</table>

3. Build USN all military requirement using modified Aviation Sqdn Model
   - BAMS UAV skills requirement different from current USN UAV inventory
   - Higher tech, less maintenance

4. “Civilianize” USN military billets subject to military essentiality
   - 7:10 for non-watch billets (maintenance & support)
   - 1:1 for watch and supervisory billets(Pilot, Senso, MMCO, etc)
Manpower based on most conservative (highest) estimate of contractor requirement …

<table>
<thead>
<tr>
<th></th>
<th>CONUS</th>
<th>OCONUS</th>
<th>TOTAL</th>
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<tr>
<td>Officers</td>
<td>16</td>
<td>12</td>
<td>64</td>
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<tr>
<td>Enlisted</td>
<td>22</td>
<td>15</td>
<td>82</td>
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<tr>
<td>Contractor</td>
<td>112</td>
<td>92</td>
<td>485</td>
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<tr>
<td>Program Total</td>
<td>155</td>
<td>119</td>
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</table>

**Highlights:**

- 75% of manpower Contractor
- 50/50 mix for operational Manning

**Resulted in:**

- 80% reduction in required milpers
- 15% reduction in total manpower
- No military end strength growth
Lessons Learned

• **Manpower ConOps critical for new systems**
  - Bounds manpower trade space
  - Shows that all reasonable alternatives were considered
  - Fleet participation fosters ownership of manpower solution (and bill)

• **Identifying a surrogate BSC is important**
  - Provides acceptable analytical framework for Milestone B manpower estimate
  - Translation from BSC to new system must be logical

• **New process – First USN MER in new OSD format**
  - Total Force approach and close coordination with N125, NPC and NAVMAC facilitated buy-in from Navy manpower community

• **Continuous involvement with Stakeholder generates concurrence**
  - N1, FUNCWINGs, TYCOMS, CFFC, PATWING

• **BAMS UAV Manpower**
  - Lead turned CNO’s Human Capital Strategy initiatives
  - Total Force approach in sync (15% less people, 80% less uniforms)
  - Able to execute the program with no growth in end strength or robbing from Fleet
  - Contractors not necessarily cheaper than military (overseas)
  - Fleet does not understand the issue of personnel “right sizing” – sees problems with assignments, rotations, TAD billets …
BACKUPS & LINKS
Total Force Makeup

Military Enlisted

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Military Officer

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Reserve participation was not fully determined …

Contractor Support impact:
- 40% reduction in officer,
- 87% reduction in enlisted

Three fourths of BAMS manpower contracted
## BAMS UAV Manpower Estimate

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<tr>
<th>Billet Title</th>
<th>CONUS Squadron/FRS Officer</th>
<th>CONUS Squadron/FRS Enlisted</th>
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<th>OCONUS Squadrons Officer</th>
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<td>6</td>
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<td>0</td>
<td>7</td>
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<td>5</td>
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<td>UAV SQUADRON TOTAL REQUIREMENTS</td>
<td>16</td>
<td>22</td>
<td>117</td>
<td>12</td>
<td>15</td>
<td>92</td>
<td>64</td>
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<td>UAV PROGRAM TOTAL REQUIREMENTS</td>
<td>155</td>
<td>119</td>
<td>631</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Civilian Skill Sets

Liaison with industry suggested these skill sets are obtainable …

Aircrew

- General Unskilled
- Supervisory
- Administrative
- General

Maintenance

- Aircrew
- Other Maintenance
- Aircraft Structures Mechanic
- Aviation Electronics Technician
- Aviation Electrical Technician
- Aviation Administration

Computer Systems Technician

- Administrative
- Other Administration
- Intelligence Specialist

Aviation Supply

- Liaison with industry suggested these skill sets are obtainable …
## Number of Crews

<table>
<thead>
<tr>
<th>Crews</th>
<th>AVG Workweek</th>
<th>Shift Overlap</th>
<th>Ground Job Time</th>
<th>Surge Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>28.0</td>
<td>None</td>
<td>5hrs</td>
<td>None</td>
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<tr>
<td>7</td>
<td>27.3</td>
<td>1 hr</td>
<td>6hrs</td>
<td>Minimal</td>
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<tr>
<td>8</td>
<td>27.8</td>
<td>2hrs</td>
<td>5hrs</td>
<td>Some</td>
</tr>
</tbody>
</table>

### Assumptions:
- Shore duty (33.3 hr effective workweek)
- Work week applied to civilians >> ground time is surplus.
- Intel and MCE Tech not part of crew:
  - 6 Intel, 8 hr shifts, no overlap, 5 hr surplus
  - 5 MCE Techs, 8 hr shifts, no overlap or surplus

### Observations:
- 6 crews is minimum to support 24/7 and allow for some ground job time.
- 7 crews is minimum to support 24/7, allow for some ground job time and surge.
- 8 crews allows most flexibility
- 1 hr crew overlap = 1 additional crew
Crew Cycle

8 crews, 8-hr missions, 28/5hr ops/admin work week

- Minimal “ground job” with 75% civilian contingent

<table>
<thead>
<tr>
<th>Crews - 2 hr overlap</th>
<th>MCE Team 1</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crews - 2 hr overlap</td>
<td>MCE Team 2</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Team 3</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Team 4</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Team 5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Team 6</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Team 7</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Team 8</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crews - 1 hr overlap</th>
<th>MCE Team 1</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crews - 1 hr overlap</td>
<td>MCE Team 2</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Team 3</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Team 4</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Team 5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Team 6</td>
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<td></td>
<td>MCE Team 7</td>
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<td>MCE Team 8</td>
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<table>
<thead>
<tr>
<th>Intel Support Personnel</th>
<th>MCE Intel 1</th>
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<tbody>
<tr>
<td></td>
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<td>MCE Intel 3</td>
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<tr>
<td></td>
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<td>MCE Intel 5</td>
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<tr>
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<td>MCE Intel 6</td>
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<td></td>
<td>MCE Intel 7</td>
<td>8</td>
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<tr>
<td></td>
<td>MCE Intel 8</td>
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<table>
<thead>
<tr>
<th>MCE Technicians</th>
<th>MCE Tec 1</th>
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<td>MCE Tec 3</td>
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<td></td>
<td>MCE Tec 4</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MCE Tec 5</td>
<td>8</td>
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</tbody>
</table>

Weekly Total Hrs:
- MCE Team 1: 32.0
- MCE Team 2: 32.0
- MCE Team 3: 32.0
- MCE Team 4: 32.0
- MCE Team 5: 32.0
- MCE Team 6: 32.0
- MCE Team 7: 32.0
- MCE Team 8: 27.9 AVG

Weekly Total Hrs:
- MCE Team 1: 32.0
- MCE Team 2: 32.0
- MCE Team 3: 32.0
- MCE Team 4: 32.0
- MCE Team 5: 32.0
- MCE Team 6: 32.0
- MCE Team 7: 32.0
- MCE Team 8: 31.7 AVG

Weekly Total Hrs:
- Intel Support Personnel: 32.0
- MCE Intel 1: 32.0
- MCE Intel 2: 32.0
- MCE Intel 3: 32.0
- MCE Intel 4: 32.0
- MCE Intel 5: 32.0
- MCE Intel 6: 32.0
- MCE Intel 7: 27.3 AVG

Weekly Total Hrs:
- MCE Tec 1: 40.0
- MCE Tec 2: 32.0
- MCE Tec 3: 32.0
- MCE Tec 4: 32.0
- MCE Tec 5: 32.0

32.0 AVG

8 crews, 8-hr missions, 28/5hr ops/admin work week

- Minimal “ground job” with 75% civilian contingent
## Number of Vehicles

<table>
<thead>
<tr>
<th>Vehicles</th>
<th>Maint Shifts Between Flights</th>
<th>Avg. Annual Flight Hours</th>
<th>FLE</th>
<th>Surge Capacity</th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td>3.5</td>
<td>2,184</td>
<td>1.2X</td>
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<tr>
<td>5</td>
<td>3</td>
<td>2,621</td>
<td>X</td>
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<td>4</td>
<td>2</td>
<td>3,276</td>
<td>.8X</td>
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<td>1</td>
<td>4,368</td>
<td>.6X</td>
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</table>

**Assumptions:**
- 6hr transits, 20hr on station, 32hr flights
- Single 8 hour maintenance shift
- Continuous 24/7 operations

**Observations:**
- 6 vehicles will support 2 UAV’s 24/7 continuously
- 5 vehicles will support almost 24/7 x 2
- 4 vehicles will support 24/7
- 3 vehicles will not support continuous 24/7
## Number of Vehicles

<table>
<thead>
<tr>
<th>Vehicles</th>
<th>Maint Shifts Between Flights</th>
<th>Avg. Annual Flight Hours</th>
<th>FLE</th>
<th>Surge Capacity</th>
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</thead>
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<td>1.2X</td>
<td>2 UAV’s 24/7 continuous +</td>
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<td>3</td>
<td>2.5</td>
<td>3,259</td>
<td>.6X</td>
<td>Some</td>
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### Assumptions:
- 2hr transits, 28hr on station, 32hr flights
- Single 8 hour maintenance shift
- Continuous 24/7 operations

### Observations:
- 6 vehicles will support 2 UAV’s 24/7 continuously and provide some surge capacity.
- 5 vehicles will support 2 UAV’s 24/7 continuously.
- 4 vehicles will support 24/7 and significant surge.
- 3 vehicles will support 24/7 with some surge.
5-person Crew
Knowledge, Skills & Abilities (KSAs)

• Mission Commander
  - Responsible for UAV safety of flight
  - POC for coordination with supported commands
  - Pilot station duties
  - KSA for Maritime Dominance MSN
    • VP, VQ, VS, HS, HSL type skill

• Pilot
  - Mission planning
    • Includes input to supported commands mission plans
  - UAV control
  - Launch and recovery
  - Flight and MSN plan adherence
  - Position UAV to employ sensors
  - Adjust flight track when mission tasks or priorities change
  - Employ sensors when necessary
  - KSA for Maritime Dominance MSN
    • Fleet aviator experience probably adequate

• SENSO 1 (EO/IR - Radar)
  - Support mission planning
  - Plan sensor employment
  - Process sensor data
  - Recommend actions to MC / supported command
  - Recommend flight path adjustments to optimize sensor employment
  - KSA for Naval Aircrewman, OS, IS, other

• SENSO 2 (ESM)
  - Same tasks as SENSO 1
  - KSA for EW, CT
    • Also OS, AT, IS with formal training

• Intel Specialist
  - Support mission planning to factor Intel specific needs
  - Prepare and brief Intel section for mission
  - Perform ad hoc assessment of data collected within MCS capability
  - Screen data and forward high interest items to supporting reach-back facility for exploitation
  - Prepare mission and post-mission reports
Potential BAMS Career Paths
Pilot / NFO

**VP Centric**

- **Flight School**
- **VP/MMa Squadron Sea Duty**
- **BAMS SQD Shore Duty**
- **Disassociated Sea Tour Sea Duty**
- **VP/MMa SQD DH Tour Sea Duty**
- **2nd Shore DC Joint Shore Duty**
- **VP/MMa - BAMS XO / CO Shore Duty**

**No VP DH Screen**

- **Flight School**
- **VP/MMa Squadron Sea Duty**
- **Training Command Shore Duty**
- **Disassociated Sea Tour Sea Duty**
- **BAMS SQD DH Tour Shore Duty**
- **2nd Shore DC Joint Shore Duty**
- **BAMS XO / CO Shore Duty**

**BAMS Centric**

- **Flight School**
- **VP/MMa Squadron Sea Duty**
- **BAMS SQD Shore Duty**
- **Disassociated Sea Tour Sea Duty**
- **BAMS SQD DH Tour Shore Duty**
- **2nd Shore DC Joint Shore Duty**
- **BAMS XO / CO Shore Duty**
Military Essentiality Criteria*

- Direct combat or combat support (flying bullets)
- **Military readiness**
  - Flight surgeons, EOD, etc
- **Military experience**
  - Program/Requirements officers, RTC instructors, etc.
- **Military tradition or custom**
  - Navy Band, Recruiters, Chaplains, etc
- **Uniformed representative in external services/agencies**
  - Exchange tours, military attaché's, etc.
- **Civilian skills unavailable**
- **Required by law**
- **Sea-shore rotation and career progression (enlisted)**

* TFMMS Coding Manual
USN/USAF Manning

USN BAMS UAV manpower patterned after USAF Global Hawk – similar people requirement when adjusting for deltas in conops and manpower structure

- USAF manpower supports full wartime requirement (10 continuous orbits)
- USAF ConOps requires full mission crew stateside PLUS L/R crews at OCONUS sites
- Support ConOps different – Medical, weather, comm, security and other USAF billets not included in BAMS UAV
  - 5 Flt Surgeons/5 Corpsman
  - 45 WX support, 36 Comm support
  - 60 Crew Chiefs, 165 Security, others
- USAF MOS structure inherently drives higher manpower
  - 3 USAF comm maint MOS’s = 2 USN AT’s
- USAF limited use of CLS result in higher total manpower
  - 15% reduction for BAMS using CLS

<table>
<thead>
<tr>
<th></th>
<th>USAF</th>
<th>USN</th>
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</thead>
<tbody>
<tr>
<td>Peacetime</td>
<td>40 24hr sorties from each of 4 sites</td>
<td>24/7 at 5 sites continuous</td>
</tr>
<tr>
<td>Wartime</td>
<td>10 orbits continuous (war)</td>
<td>Same as Peacetime</td>
</tr>
<tr>
<td>Crew Concept</td>
<td>20/2E 6hr mission time</td>
<td>20/2E 6hr mission time</td>
</tr>
<tr>
<td>Intel Support</td>
<td>12O/33E at CONUS site</td>
<td>10/7E at each of 5 sites</td>
</tr>
<tr>
<td>Support Concept</td>
<td>Independent of base facilities</td>
<td>Utilizes base facilities</td>
</tr>
<tr>
<td>OPS Support</td>
<td>Active &amp; Reserve</td>
<td>Active &amp; Contractor</td>
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<tr>
<td>Maintenance</td>
<td>Active &amp; Reserve</td>
<td>Contractor</td>
</tr>
<tr>
<td>Individual</td>
<td>7 Officer / 33 Enlisted</td>
<td>4 Officer / 15 Enlisted</td>
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<tr>
<td>MOEs/Ratings</td>
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<tr>
<td>% CLS</td>
<td>4.5% CLS COS</td>
<td>0% CLS</td>
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<tr>
<td></td>
<td>99% CLS CO</td>
<td>50% CLS</td>
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<tr>
<td>Total Program</td>
<td>1772 *</td>
<td>631</td>
</tr>
</tbody>
</table>

* 2001 USAF GH MER: 324AD off, 1110 AD enl, 17 Civ TechReps, 254 Res, 67 CLS
BAMS Manpower ConOps Briefings

Others:
- VP OAG 12 Aug
- Beale AFB 9TH RS 11 Sep
- COMPACFLT Staff 26 Aug
- CPRG Staff 26 Aug
- NSAWC Staff 26 Aug
- Reno ANG 27 Aug
- 3rd Fleet Staff 27 Aug
- CNAP Staff 25 Aug
- CCG-1 Staff
- SURFPAC Staff
- SPAWAR SSC-SD

- WPAFB 21 July
- CPRW 5 Staff 22 July
- COMPATRESWING 30 Sept
- Wash, DC
  - OPNAV
  - N780
  - N125
  - N20 22 July
- East Coast
  - 2nd Fleet Staff
  - CFFC Staff
  - CNAL Staff
- CPRG
  - CPRW 11
  - VP-30
- ACC
  - PMA 263
- NAVMAC
  - 1 Oct
- ACC
  - COMPATRESWING 30 Sept
- NAVMAC
  - 1 Oct
- CVN 9 Oct
- LHD 4 Sep
- VC-6 9 Oct
BACKUPS & LINKS

Manpower ConOps Variables
Organization

Squadron

- **Self-sufficient / stand-alone squadron**
  - Fully responsible for, and capable of all aspects of training, operations and maintenance
  - Squadron supports base TAD needs
- **Personnel are PCS to individual BAMS squadron UICs**
  - Located at Sigonella, Jacksonville, Diego Garcia, Oahu, Kadena (notional)
- **Number of squadrons = number of permanent BAMS operating bases**
  - 3, 5, 7
- **CONUS-based squadron also serves as FRS**
  - If there are two CONUS-based squadrons, only one is an FRS
Organization
Detachment (Deploy)

- CONUS-based “Mother” Squadron(s)
  - Detachments at 4-5 OCONUS bases
- Detachments are capable of supporting normal operations
  - 24/7 for 7 days
- Detachment does not have manning to support high-tempo operations
  - Relies on VP personnel for augmentation
- Supports CNO “surge” concept
- Concept may require VP squadron manpower increase
  - Option A (Deploy)
    - Deploy with VP Squadron
    - IDTC Training at mother squadron
    - 2 home / 1 deploy (PERSTEMPO)
    - Most manpower intensive unit
Organization
Detachment (PCS)

- CONUS-based “Mother” Squadron(s)
  - Detachments at 4-5 OCONUS bases
- Detachments are capable of supporting normal operations
  - 24/7 for 7 days
- Detachment does not have manning to support high-tempo operations
  - Relies on VP personnel for augmentation
- Supports CNO “surge” concept
- Concept may require VP squadron manpower increase
  - Option B (PCS)
    - BAMS personnel PCS at TSC UIC
    - Training, operations and maintenance conducted at the Det level
Air Vehicle
Global Hawk-like

- Payload Capacity: 2800 lbs
- Loiter Altitude: 45 kft
- Range: 5400 NM
- TOS: 34 hrs
- Fuselage Length: 44.4 ft
- Wing Span: 117 ft
- Vehicle Height: 15.2 ft
- Engines: 1 Turbofan
<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload Capacity</td>
<td>2800 lbs</td>
</tr>
<tr>
<td>Loiter Altitude</td>
<td>35 kft</td>
</tr>
<tr>
<td>Range</td>
<td>4650 NM</td>
</tr>
<tr>
<td>TOS</td>
<td>23.5 hrs</td>
</tr>
<tr>
<td>Fuselage Length</td>
<td>96.5 ft</td>
</tr>
<tr>
<td>Wing Span</td>
<td>93.5 ft</td>
</tr>
<tr>
<td>Vehicle Height</td>
<td>25.8 ft</td>
</tr>
<tr>
<td>Engines</td>
<td>2 Turbofan</td>
</tr>
</tbody>
</table>
Capability Package
Multi-INT

• UAV possesses full spectrum sensor suite
  - EO and IR
  - Radar with maritime and overland modes
  - Multi-INT
    • ESM suite but specific capability not yet defined
    • COMINT capability minimum, possibly none - TBD
    • Imagery from EO / IR sensor
  - On board vs. off board data integration and fusing not yet defined

• Limited comm and data relay
  - Potential for modular avionics design to allow reconfiguration for dedicated comm
    and data relay mission

• Largest mission operating crew to operate UAV and sensor suite

• Largest data exploitation crew

• Typical capability
  - Provide wide area ocean surveillance with a maximized area coverage
  - Classify maritime targets using ISAR
  - Detect moving targets on land, open ocean and littoral environments
  - Provide strike support through SAR imaging – to include in-theater cueing
Capability Package
RF EO / IR

• UAV possesses fully capable RF and EO / IR suite
  - EO and IR
  - Radar with maritime and overland modes
  - ESM, level of capability less than ELINT quality suite
  - On board vs. off board data integration and fusing not yet defined

• Limited comm and data relay
  - Potential for modular avionics design to allow reconfiguration for dedicated comm and data relay mission

• Mission operating crew to operate UAV and sensor suite

• Data exploitation crew

• Typical capability
  - Provide wide area ocean surveillance with a maximized area coverage
  - Classify maritime targets using ISAR
  - Detect moving targets on land, open ocean and littoral environments
  - Provide strike support through SAR imaging – to include in-theater cueing
Force Structure
MMA POR

• **12 x VP squadrons**
  - 6-8 MMA per squadron (type aircraft dependent)
  - 12 crews per squadron
    • Sized to CONOP requirements
  - Crew size (9-11)
    • Boeing – 3 Pilots, 2 NFOs, 3-4 Sensor Operators and 1 Inflight Tech
    • Lockheed Martin – 3 Pilots, 2 NFOs, 2 Flight Engineers, 3 Sensor Operators and 1 Inflight Tech.
  - MC rates ~ 0.85 increase CSR 2.0

• **MMA Maintenance concept TBD**
  - Mixed contractor to uniformed
  - Significant reduction due to increased reliability and commercial logistics
  - 30–70% reduction squadron and AIMD

This alternative represents OPNAV current plan for the MMA Program
Force Structure
MMA Reduced POR

• Fewer squadrons of the current POR size
  - Bottom line is force needs to be sized to win war
  - Requirement is for aircrew/aircraft not squadrons

• 9 x VP squadrons - fewer squadrons but same size
  - 6-8 MMA per squadron (type aircraft dependent)
  - 12 crews per squadron
  - Crew size 10 (possibly 11)
    • Current 11 man crew but without a flight engineer

• MMA Maintenance concept TBD
  - Mixed contractor to uniformed
  - Significant reduction due to increased reliability and commercial logistics
  - 30–70% reduction squadron and AIMD

This alternative represents least number of VP aircrew available to augment BAMS Det personnel
• **Current VP force structure with P-3 aircraft**
  - P-3 FLE issue will reduce inventory of aircraft:
    • CNAF proposed
      - Maintain current force structure
      - Reduce P-3 inventory to 150 aircraft
      - Transition to 18 month IDTC (reduce FLE and increase surge ops capability)
    • MMA Offsite CNO agreed to
      - 150 x P-3 inventory
      - Maintain force structure
      - Acknowledge need to integrate reserves 12-0-3-1 (decision pending)

• **12 x VP squadrons**
  - 8-9 x P-3 PAA per squadron deployed
  - Variable PAA during IDTC
    • Broken into three phases (0-6, 6-12, 12-18)
  - 12 aircrews per squadron
  - Crew size = 11
  - 18 month IDTC

• **Maintenance concept remains uniformed**

This alternative represents greatest VP aircrew available to augment BAMS Det personnel
OPS Support Concept
Contractor Only

- Contractor personnel used to man UAV aircraft and sensor stations

- Limited uniformed personnel in the Det
  - Provide uniformed personnel to complete chain of command
  - Skills where clearances or training for data exploitation make civilian use impractical
  - Insight into tactical and operational needs of supported command
  - Better understanding of current tactics

- May pose a problem for status of forces agreements at OCONUS bases

- Training is the contractor’s responsibility
OPS Support Concept
Contractor & Navy

- ~ 50% of mission watch stations manned by contractor

- Several options available - need to reduce
  - Contractor mans sensor stations with USN pilot and NFO controlling the UAV
  - Contractor fills pilot / NFO watch stations with qualified personnel while Navy personnel monitor sensor watches
  - Even split of watch stations

- Uniformed personnel fill management positions
  - Department head, training, ...

- Skills where clearances or training for data exploitation make civilian use impractical

- May pose a problem for status of forces agreements at OCONUS bases

- Training at the Det is a Navy responsibility
  - Includes civilian personnel
OPS Support Concept
Navy Only

- **Navy pers man all watch stations**
  - Pilot, NFO, and enlisted aircrewmen required
  - Data exploitation personnel

- **Training a uniformed responsibility**
  - Contract support at RAG for training is an option
• Contractors provide all maintenance on site

• Uniformed officer and CPO liaison between contractor and Det operations (need to check how done in Training Command)

• May pose a problem for status of forces agreements at OCONUS bases

• Training is the contractor’s responsibility

• Potential problem if BAMS must forward deploy to support limited duration operations
Maintenance Support Concept
Contractor & Navy

• Contractors provide all maintenance for UAV specific components
  - Airframe, engine, flight controls, data links
  - May perform all UAV unique ground station (data link) maintenance
  - Navy personnel provide maintenance for avionics
    • Rationale: most avionics are off the shelf, non-developmental systems

• Uniformed officer and CPO liaison between contractor and Det operations

• May pose a problem for status of forces agreements at OCONUS bases

• Training responsibility split by systems

• Potential problem if BAMS must forward deploy to support limited duration operations
Maintenance Support Concept
Navy Only

• Normal Naval Aviation maintenance operations modified by any emerging concepts
  - Example: KSA personnel policies

• Includes civilian “tech reps”
  - Can be more than normal if impact reduces uniformed personnel requirements
    • May perform all UAV unique ground station (data link) maintenance

• Training is USN responsibility
  - RAG training can be contracted
Support Concept
O to D

• **Organization to Depot support concept implies**
  - Very reliable components
  - Spares on hand to prevent supply caused NMC aircraft
  - Automated ordering system
  - Short transport time from depot to squadron

• **All UAV specific parts are O to D**
  - Example: engine, actuators, pumps, …

• **Legacy components, especially avionics, are supported through the USN repair and supply system**
  - Example: UHF/VHF radio, IFF, FLIR, …
  - I level support may be in theater or in CONUS
  - No ‘I level’ repair facilities generated by BAMS
    • Use existing facilities
**Community Ownership**

**MPR Force**

- **MPR Community**
  - MPR Flags and Wings already involved, leading definition of BAMS
  - Potential large pool of skilled personnel to draw from in order to support BAMS

- **BAMS UAV Training**
  - Utilize VP pilots, NFO’s, enlisted aircrew, and maintainers but do not consider it a "disassociated tour"
    - Reap benefit of personnel, experienced in maritime patrol
    - Take “BAMS specific” training prior to BAMS tour, return to MMA community
      - Dovetails with Task Force Excel (TFE), just-in-time training
      - Leverage experience into MMA community
    - Have discrete BAMS community within MMA Community
      - Potential to become “second class citizens”

- **Career Path**
  - Incentivize desirability of BAMS tour by pay, auction ($$) (Assignment Incentive Pay-AIP), or promotion

- **Advocacy**
  - Requires Community leaderships’ collective commitment and support
• **Stand up new BAMS UAV Community**
  - Non aviator focus
  - Will likely add to endstrength requirements

• **Training**
  - Specific BAMS UAV training pipeline (aircrew, operators, maintainers), follows common VP training
  - Likely shorter pipeline, reducing Individuals Account bill
  - Over a career, less individual training required as proficiency maintained

• **Career Path**
  - Provide BAMS Command tours (sea and shore)
  - Provide a base for sea shore rotation
  - Will it be viewed as a desirable career?

• **Advocacy**
  - Career path will not likely lead to Flag and advocacy will be lacking
TSC Capability
MSN & Data Exploitation

• ‘TSC Capability’ represents the ability of the TSC at each BAMS to support BAMS missions
  - Planning, execution, post-mission processing and assessment
• Personnel involved are assigned to the BAMS Det UIC
• Facilities are TSC owned
  - Similar to CVW personnel working in CIC or CVIC during deployments
  - TSC may use facilities to support VP and VQ missions

• TSC has equipment and personnel to independently execute a BAMS mission
• Includes number and types of specialists
  - Examples: IS, AW, CT, Intel Officer, Cryptology Officer, …
• This variation complies with roadmaps for exploitation
  - Example: FIST concept
  - List other constraining plans
TSC Capability
MSN & Support

• Same assumptions as the Mission and Data Exploitation option

• TSC has equipment and personnel to execute a BAMS mission with the following exceptions
  - Capability similar to a VP crew
  - No Cryptology personnel - officer or CT
  - Limited number of IS personnel
    • Specifically limited numbers of imagery analysts
      - Rely on CONUS or JIC support
Number of Bases

3

• Overview
  - Five bases
  - 4 OCONUS
  - Baseline concept
  - Provides world wide access
  - Leverage current TSC infrastructure
  - CONUS based squadron would be FRS

• Capability
  - 3 bases offers less coverage than required for world-wide access
  - World-wide access attainable only through MOCC capability and Surge Concept
  - UAV range & endurance critical

• Infrastructure
  - 3 bases
    - Supports “Surge” concepts
  - 2 OCONUS
  - Leverage current TSC infrastructure
  - Least infrastructure cost
  - Fewest personnel, lower cost
  - Added cost to configure Dets to routinely deploy to other bases

* Open ocean commercial SATCOM coverage limited
Number of Bases
5

• Overview
- 5 bases
- 4 OCONUS
- Baseline concept
- Provides world wide access
- Leverage current TSC infrastructure
- CONUS based squadron would be FRS

• Capability
- 5 bases offers coverage required for world-wide access
- 4 OCONUS
  - Provides opportunity for interoperability with host nation(s)
- UAV with GH-like endurance required
  - In order to provide global coverage

• Infrastructure
- 5 bases
  - Baseline concept
- 4 OCONUS
  - Leverage current TSC infrastructure

Notional Basing Alternatives
- Open ocean commercial SATCOM coverage limited
**Overview**
- 7 Bases
- 5 - 6 OCONUS
- Leverage available TSC infrastructure
- 2 CONUS based squadrons could support HD/HS
- Only 1 CONUS based squadron would be FRS

**Capability**
- Seven bases offers coverage *beyond* that required for world-wide access
  - Modest additional capability
  - Increased redundancy, decreased risk
- 5 - 6 OCONUS
  - Provides maximum opportunity for interoperability with host nation(s)
- May be required for UAV with less mission endurance
  - In order to provide global coverage

**Infrastructure**
- 7 bases vice 5 or 3
- 5 - 6 are OCONUS
  - Increased commitment & reliance on host
- Leverage TSC infrastructure
- More personnel, infrastructure & cost
Ship Capability
Specifically Trained

• Add “BAMS specific” billets
  - CV, LHD, LHA, some CG

• Benefits
  - Billet(s) will likely draw from pool of “BAMS trained and experienced personnel”
    • Removes possibility of adding to ship’s workload requirement
  - Could be filled for deployment work-ups & deployment
  - Provides sea billets for BAMS community
    • Broadens experience
    • Helps promotion

• Costs
  - Adds end strength requirement
  - Number of billet requirements must be defined. Unlikely one will suffice
    • Maintenance and watch requirements
    • Equipment maintenance may be additive to ship’s workload when not deployed
  - Inefficient use of personnel when no BAMS OPS underway
Ship Capability
Trained

• **Draw personnel from existing billet structure**
  - Flight ops and sensor employment should require average aptitude
  - Identify Officers/Sailors from embarked staff or crew
    • Collateral responsibility
    • Send to “Ship operator” and “BAMs Equipment” school house in IDTC

• **Benefits**
  - On larger ships, large pool to draw from
    • Likely to be low workload requirement
    • Could be efficient use of manpower, does not add to end strength requirements
  - Training and experience opportunity for crew
  - Could use tech reps

• **Costs**
  - Must consider Rubic’s cube nature of Manpower requirements…
BACKUPS & LINKS

Initial Manpower ConOps Alternatives
“Manpower High” refers to highest Manpower requirement

_Could_ equate to highest level of capability and flexibility
- Potentially the least operational risk
- But…may also be greatest programmatic risk
**Manpower Low**

- "Manpower Low" refers to lowest Manpower requirement
- *Could* also equate to lowest level of capability and flexibility
  - Potentially the greatest operational risk
  - But...may be the least programmatic risk

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58
Middle Ground

- “Middle Ground” refers to the alternative that seemed to lie between High and Low Manpower requirements
- Takes into account cost, cost avoidance and operational risk

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UAV Centric

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- “UAV Centric” refers to most acceptable alternative from a UAV community perspective
**Transformational**

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- “Transformational” refers to alternative that appeared to support DoD Transformation concept
  - For example…
    - Minimum use of uniformed personnel
    - Greatest use of contractors - outsource
    - Synergistic use of force structure - MPR personnel supporting BAMS operations
    - May require deployment or “Surge” operations to cover crises
    - Acceptable risk for normal peacetime operations