Overview

• Background
  • Product Groups
    – Full-scale Aerial Targets
    – Subscale Aerial Targets
  • Summary
Aerial Target Systems

• Airborne aircraft designed to replicate threat aircraft systems
  – Enemy fighter aircraft
  – Enemy cruise missiles

• Required per Public Law, Title 10, US Code 2366
  – New / improved weapon systems are required to demonstrate lethality prior to production
  – Also required for USAF air-to-air weapon system evaluation program (WSEP)

• Used to validate performance of DOD ground-air and air-air missile/aircraft systems
  – Must emulate performance, signatures, countermeasures (infrared and electronic attack)
Background

• The entire Air Force Aerial Targets team provides
  – Realistic threat-representative aircraft “presentations”
    • The target itself
    • The ability to control the target in the air
    • Launch, recovery, maintenance, repair

• The Aerial Targets System Directorate
  – Develops, procures and sustains aerial targets and related systems
Who Are Our Customers?

Missile Development Programs & Testers

SHOOTERS • OPERATORS • MAINTAINERS
691st Armament Systems Squadron

**CONTRACTING**
Capt Rebecca Little
Leanne Green GS-12
Karen Wagner GS-12
Michael Rivera GS-07

**Aerial Targets Squadron (691 ARSS)**
Commander: Lt Col Shaun House
Deputy Commander: Audrea Feist GS-14
Technical Director: Charlie Reuter GS-14
TAMS: George Dollson, Tiffany Haertelt

**FINANCE**
Jo-An Williams GS-12
Larry Newhouse (TAMS)
Scott Rahmes (TAMS)

**Full-Scale IPT (RTD)**
- **QF-4**
  - Capt Alex Sexton (PM)
  - Glenn Ragsdale GS-13* (EN)
  - Tiffany Bray GS-11 (LG)
  - **TEAS**
    - Brent Smith (EN)
    - Eddie Sutton (EN)
    - Dick Cook (EN)
    - Gene McCormack (EN)
    - Brad Ludwig (ED)
  - **TAMS**
    - Walt Guthrie (PM)
    - Steve Baca (LG)
    - Stan Zalace (PM)
    - Harry Brannan (AMARC)
    - Billy Ondrusek (TAMS)
    - Pete Starkis (TAMS)
    - Joe Beakey (AMARC)

**Sub-Scale IPT (RTS)**
- **AST**
  - Kenneth Hislop GS-13 (PM)
  - Lynn Herzig GS-13 (EN)
  - Joe Thibault GS-13 (LG)
  - Stephanie Russell GS-12 (LG)
  - **TEAS**
    - Clay Vind (EN)
    - Rob Tuttell (EN)
  - **TAMS**
    - Kirk Kemmler (LG)

**CM/DM**
Susan Brock (EA, TEAS)
Kathy Fuszner GS-12 (EN)
Steve Jenkins (EN, TEAS)

**TCS**
Ron Starbuck (EN, TEAS)

**AFSAT (BQM-167A)**
- **Vicki Waterman GS-13**
  - (Sub-Scale IPT Lead, PM)
  - Capt Morris (PM)
  - Capt Smart (PM)
  - Lt Steven Pugh (EN)
  - 2Lt Ruben Ligsay (EN)
  - David Walthall GS-13 (EN)
  - Jim Robison GS-12 (EN)
  - **TEAS**
    - Scott Dunkle (EN)
    - Maurice Hutton (EN)
    - Tom Moore (EN)
  - **TAMS**
    - Tom Brocato (PM)
    - John Nash (EN)
    - Rich Girardin (EN)
    - Paul McShane (LG)
    - Greg McKeown (LG)
    - Linda Wong (LG)

*Navy*
Overview

• Background
• Product Groups
  – Full-scale Aerial Targets
  – Subscale Aerial Targets
• Summary
Program Manager: Capt Alex Sexton (USAF)
Systems Engineer: Mr. Glenn Ragsdale (USN)
QF-4 Full Scale Aerial Target

Key Features

- Conversion of F-4 E/G and RF-4C aircraft into full scale aerial targets
- Satisfies Title 10 “Live Fire/Lethality” development & operational test reqmts
- Operates via automatic flight control system, positive ground & airborne control, & flight termination system
- Program in full production; prime contractor is BAE Systems, Mojave, CA

Key Enabler for Multiple Strategies

- Assures warfighters that weapon systems perform adequately against threat-representative targets
  -- Satisfies public law Title 10 “Live Fire/Lethality” developmental/operational test requirements
  -- Validates operational missile/weapon system effectiveness, fighter OFP updates, etc.
  -- Supersonic, high-G, heavy-load capability
- Meets USAF, Army, Navy, allies’ test requirements
- Refurbed F-4 aircraft (by AMARC), droned by BAE

Program Schedule

Table showing delivery dates for different lots.
A Year of Successes

- Delivered 200th QF-4 in May 06
- Reestablished depot capability at Ogden Air Logistics Center
  - Key to successful fielding of RF-4C-based drones
  - Provides 3 additional years of QF-4 ops
  - Now projecting 15 lots against original rqmt for 9 lots
- BAE on track with RF-4C ECP
The Future of QF-4

- Project last QF-4 delivery in FY11
  - Inventory exhausted in FY13
- Final 3 lots populated with RF-4Cs
  - Ogden ALC addressing parts/support issues
  - Extremely limited options to extend beyond lot 15
- Trying to stretch inventory to avoid gap in full scale ops
Program Schedule
(Based FYDP Purchase/20 Killed/Yr)

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<tr>
<th>FY05</th>
<th>FY06</th>
<th>FY07</th>
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- **Begin AST Study**
- **Contract Award**
- **Prod Decision**
- **1st Del**

**Legend:**
- Requirement Definition/Contract Prep
- Development (SDD)
- Production
- Operation
- Milestone
- Program Events
- Mission Transfer
Air Superiority Target (AST)

Program Manager: Mr. Ken Hislop

Capability Description

KPP | Threshold | Objective |
--- | --- | --- |
Airspeed/15kft | 250KCAS | 200 KCAS |
-Minimum | 1.7M | 1.85M |
-Maximum | 2,3,4 Targets | --- |
Formation Flight | 2,500lbs | 5000lbs |
Payload Carriage | Auto/Manual | --- |
Flight Termination | Satisfy all critical IERS | --- |
Interoperability | --- | --- |

System Information

- Follow on Full Scale Target Program
- Planning for 2-Phase analysis of alternatives
- Phase 1: Update previous studies, get program started in FY08
- Phase 2 study to look at long-term solution
  -- Supersonic, high-G, heavy payload, with 2, 3, or 4 target formation

Schedule (TBD)

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<tr>
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<th>FY06</th>
<th>FY07</th>
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<td>Analysis of Alternatives</td>
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<td>System Design Rev</td>
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AST Status

- AoA in FY06
  - Study plan complete - approved by AFROCC
  - Two-phased study
  - Directed to focus on full scale alternatives
  - Assess intel/threat, CONOPS, effectiveness, cost
- Prepare Capability Development Document (CDD)
- AST funding status being discussed as we speak
- Anticipate series of industry days in FY07/08
- RFP release in FY08
- Contract award in FY09
Overview

• Background
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  – Full-scale Aerial Targets
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• Summary
AFSAT

Program Manager: Capt Blair Morris (USAF)
Systems Engineer: Mr. Dave Walthall
BQM-167A (AFSAT)

Key Performance Parameters

- **Payload Weight (lbs)**
  - **Threshold/Objective**
    - Total: 300/500
    - Internal: 100/350

- **Endurance/Mission Time (Min)**
  - **Total**: 60/75
  - **Mil Power**: 30 of 60 @ 15k ft/45 of 75 @ 500 ft

- **Airspeed**
  - **Minimum**: 250KCAS/200KCAS
  - **Maximum**: 0.90M/1.5M

- **Formation Flights**: 2, 3, and 4 targets

**Description**

- Assures warfighters that weapon systems perform adequately against threat-representative targets
  - Satisfies Public law Title 10 “Live Fire/Lethality” developmental/operational test requirements
  - Validates operational missile/weapon system effectiveness, fighter OFP updates, etc.
  - Subsonic, relatively heavy-payload capability
  - Meets USAF, Army, Navy, allies’ test requirements
  - All-composite airframe, long endurance, more capable than BQM-34 and MQM-107 subscale targets

**Schedule**

- **FY 01**
  - Contract Award
  - LRIP (Lot 1) Award
  - Flight Test
- **FY 03**
  - LRIP (Lot 2) Award
- **FY 05**
  - Lot 3 Award
- **FY 07**
  - RAA


AFSAT Schedule

<table>
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<tr>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
</table>

- Milestone C (LRIP) Decision (Lot 1)
- LRIP (Lot 1) Award (10 Targets)
- FPD Flights 1 - 13
- LRIP (Lot 2) Award (38 Targets)
- Initial LRIP (Lot 1) Delivery
- FAAT
- LRIP (Lot 3) Award (24 Targets)
- Pre-OT Flight Test
- Final Lot 1/Initial Lot 2 Delivery
- Operational Test
- Interim Capability
- FRP Decision
- RAA

**FPD** Flight Product Demonstration
**LRIP** Low Rate Initial Production
**FCA/PCA** Functional/Physical Configuration Audit
**FAAT** First Article Acceptance Test
**RAA** Required Assets Available
Flight Demonstration Successes

- Speeds: 218 KCAS to 0.95 MACH
- Duration: > 60 Minute (7 flights)
  - Includes 30 Minute Mil Power Run at 15,000 feet
- Payload: Total 300 lbs (100 lbs internal)
- Altitudes: 50’ – 51,600’
- Maneuvers: Pitchback, Slice, Weave, Barrel Roll, Split S, 9G Turns
- Recovery: Land (14); Water (7)
- Successful Target Recovery: 86% (18 of 21 flts)
  - None lost due to recovery system failure
Challenges

• Have lost 3 vehicles during testing to date
  – In-flight & recovery performance is good
  – Launch reliability has been a problem
• Made changes to aircraft software to ensure more robust launch capability
• Added series of flights to build reliability prior to start of operational testing
Subscale Inventory Levels

- **Existing Subscales**
- **Cum AFSAT Production**
- **Cum Subscale Inventory**

* APB & EMA pending approval/signature

Assumes USAF kill rate of 40/yr and all FMS/Navy/Army assets killed in year delivered
Overview

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Summary

- Monitoring full-scale inventory
- Final QF-4 lots supportable
- AST future under discussion at OSD level
- Aggressively monitoring subscale inventories
- Pressing to complete AFSAT flight demonstration and to improve launch reliability
BACK UP CHARTS
Gulf Range Drone Control System (GRDCS)

Key Features

- Able to track:
  - and control 4 drones (any mix)
  - 4 shooter aircraft via GRDCS II pods
  - 4 missiles (AMRAAM) via WRTTM
  - 4 high fliers (MU-2s for OTH)
  - 2 other aircraft (E-9 – AP/TM)
  - Missile termination (4 via WRTTM)
  - Target termination (4 QF-4s)
- Over-the-Horizon (OTH) operations
- 8 consoles (Tyndall), 14 ground stations, 15 tracking pods, 2 Mobile control systems, 1 development system (Eglin)

Program Schedule

- IOC - 1985
- Sustainment – FY13
- Implementation of Advanced Target Control (ATCS)
  - Leverages Multi-Service Target Control System (MSTCS) and other CTEIP developed systems
- ATCS RAA – FY12

Program Manager: Everett Eblen
Lead Engineer: Jim Lefebvre
Concern Areas

- Operates on commercial frequency bandwidth (915 MHz)
- No GPS
- No encryption
- Parts Obsolescence
- Future upgrades/replacement