United States Air Force

Air Force Aerial Targets

October 2006

NDIA Brief

Panama City Beach, FL

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Director, 691st Armament Systems Squadron
Eglin AFB, FL

Overall Classification of This Briefing is Unclassified

Overview

- **Background**
- **Product Groups**
  - **Full-scale Aerial Targets**
  - **Subscale Aerial Targets**
- **Summary**

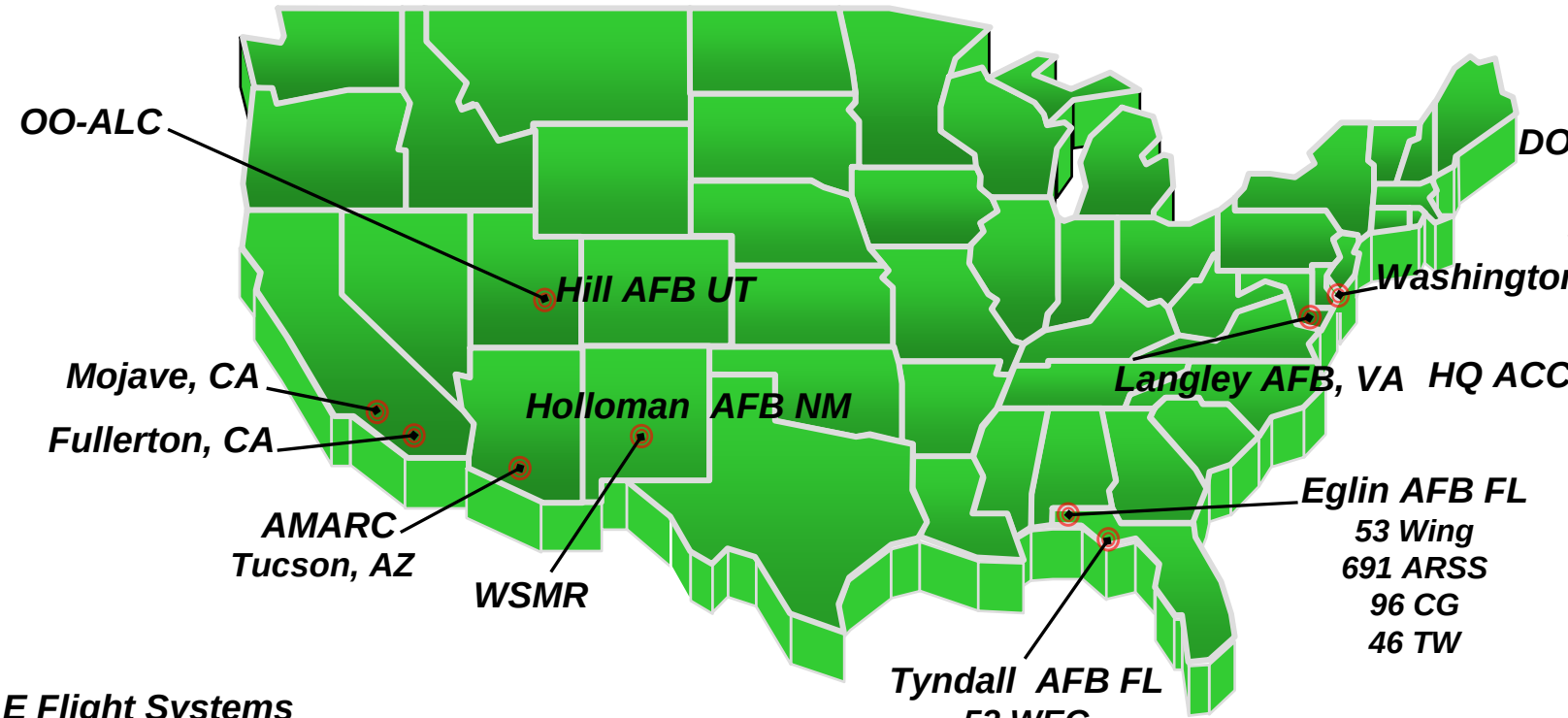
Aerial Target Systems

- 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

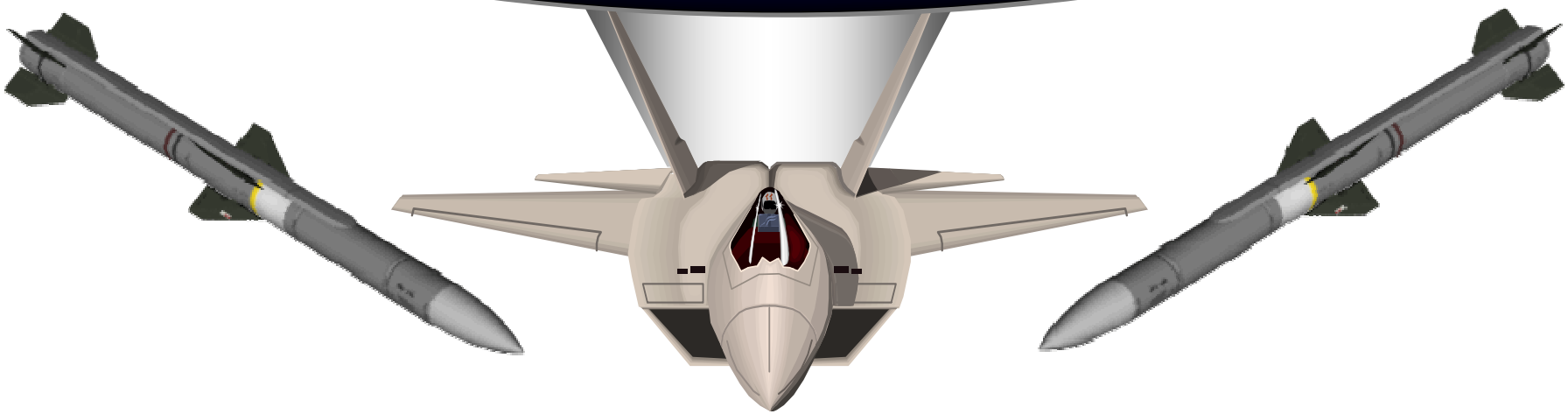
Aerial Targets Organizations



BAE Flight Systems
5 D
Lockheed Martin
Cartwright Electronics
MicroSystems

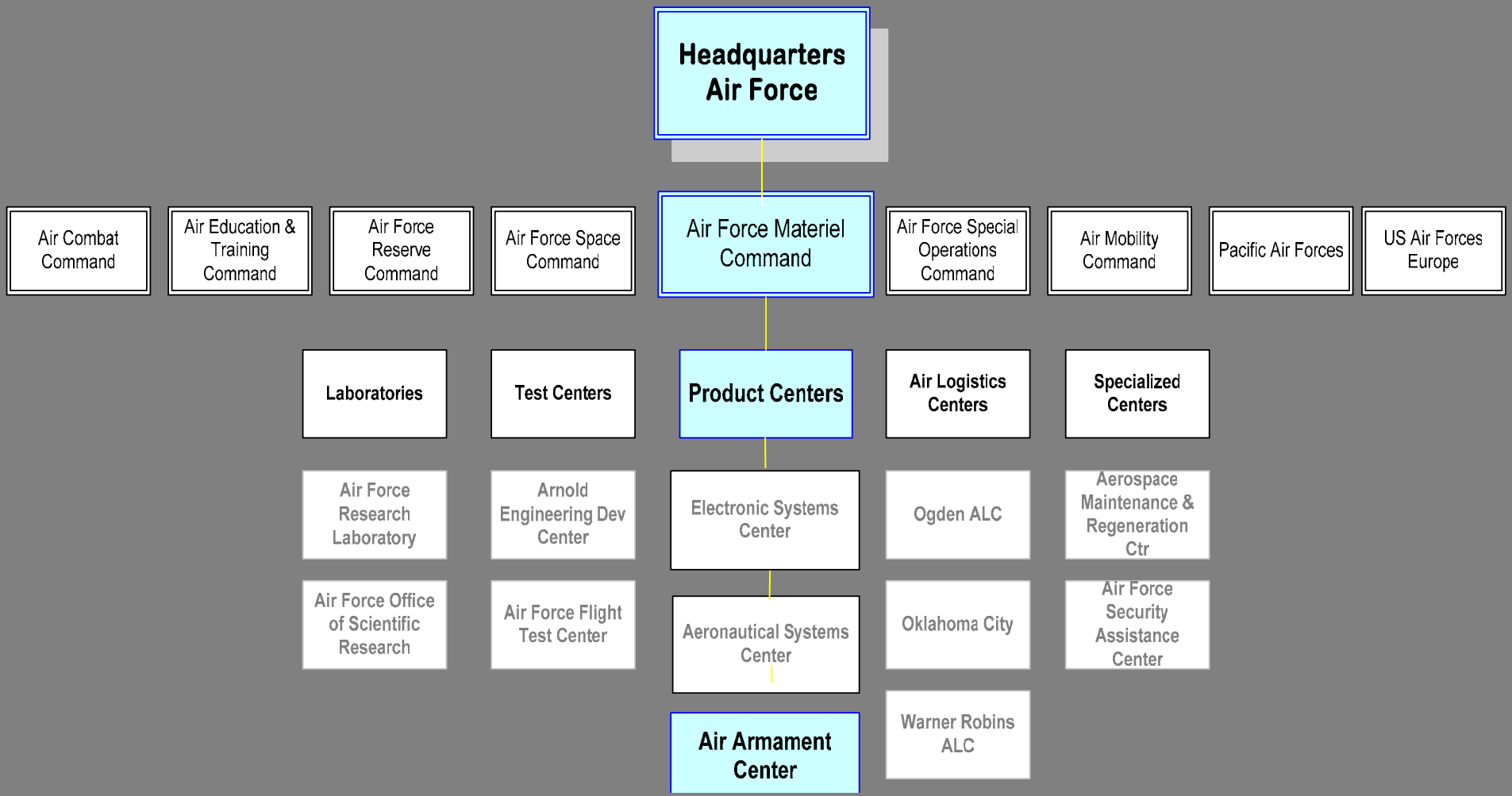
Who Are Our Customers?

Missile Development Programs & Testers



SHOOTERS • OPERATORS • MAINTAINERS

Where We Fit In



691st Armament Systems Squadron

691 ARSS

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

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

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)

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)

Sub-Scale IPT (RTS)

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)

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

TCS
Ron Starbuck (EN, TEAS)

*Navy

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QF-4

UNMANNED UNARMED UNAERIAL
653D ARMAMENT SYSTEMS SQ

Program Manager: Capt Alex Sexton (USAF)

Systems Engineer: Mr. Glenn Ragsdale (USN)

QF-4 Full Scale Aerial Target

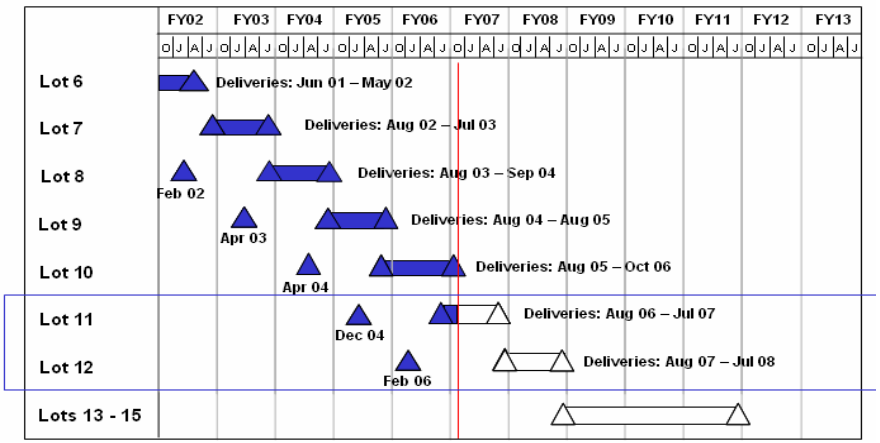
Key Features

- 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

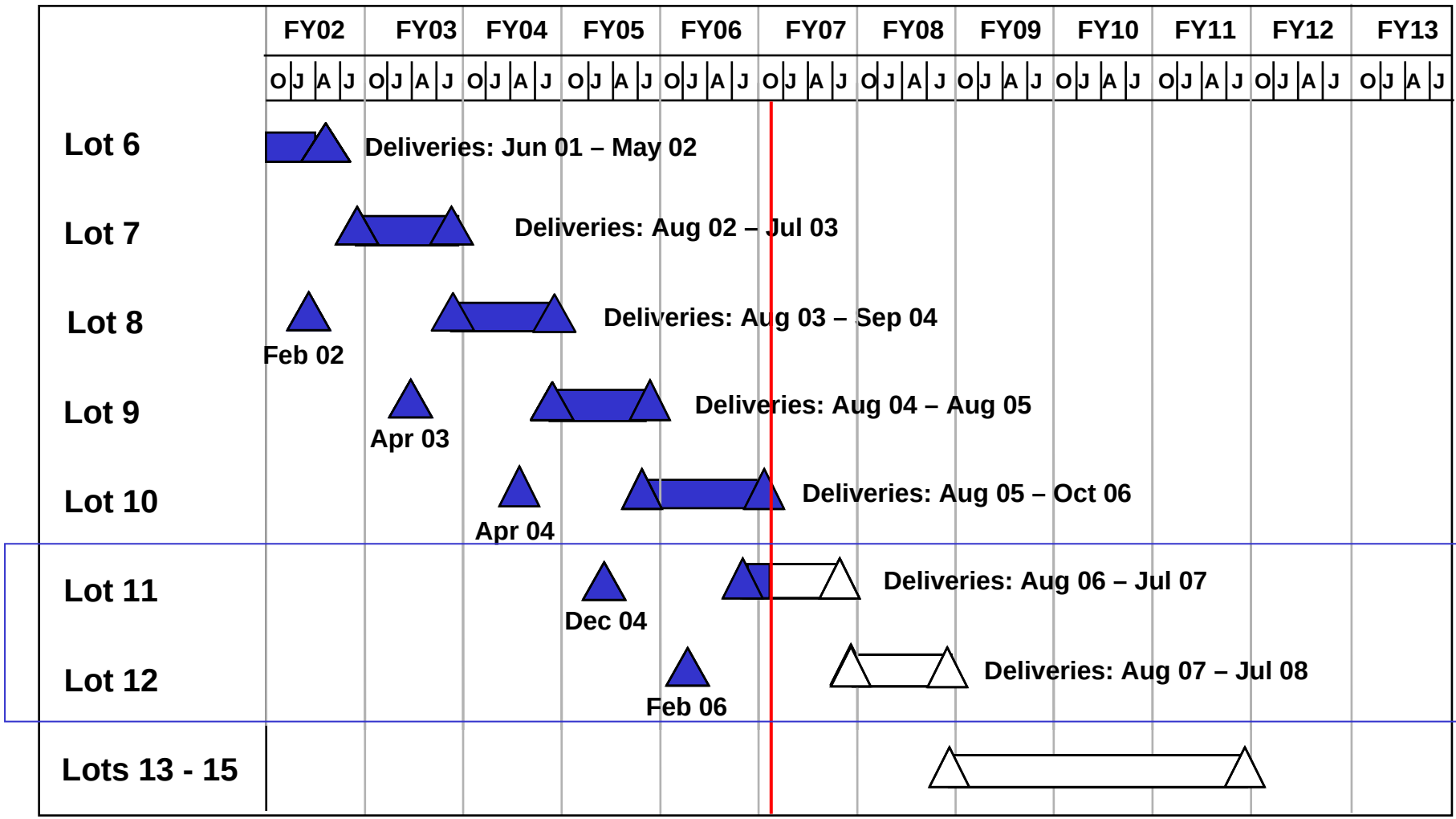
Key Enabler for Multiple Strategies

- 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-payload capability
- Meets USAF, Army, Navy, allies’ test requirements
- Refurbed F-4 aircraft (by AMARC), droned by BAE

Program Schedule



QF-4 Master Schedule



Overview

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)

FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13 FY14 FY15 FY16 FY17 FY18 FY19 FY20 FY21

QF-4 E/G/RF

F-4E F-4E F-4E F-4E RF-4C RF-4C RF-4C

AST

Begin AST Study

B

Contract Award

C

Prod Decision

1st Del

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

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)

EVENT	FY06	FY07	FY08	FY09
Analysis of Alternatives	△	△		
Request for Proposal			△	
Capability Devel Doc		△	△	
Program Documents	△		△	
Milestone B			△	
Contract Award				△
System Design Rev				△

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

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AFSAT

Program Manager: Capt Blair Morris (USAF)

Systems Engineer: Mr. Dave Walthall

BQM-167A (AFSAT)

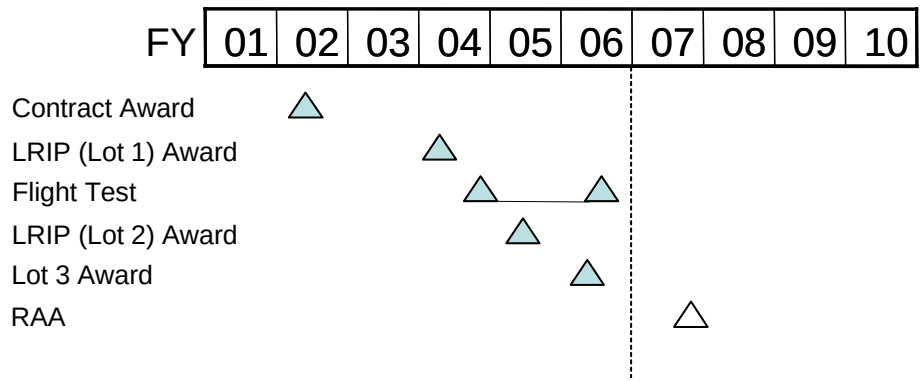
Key Performance Parameters

- 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

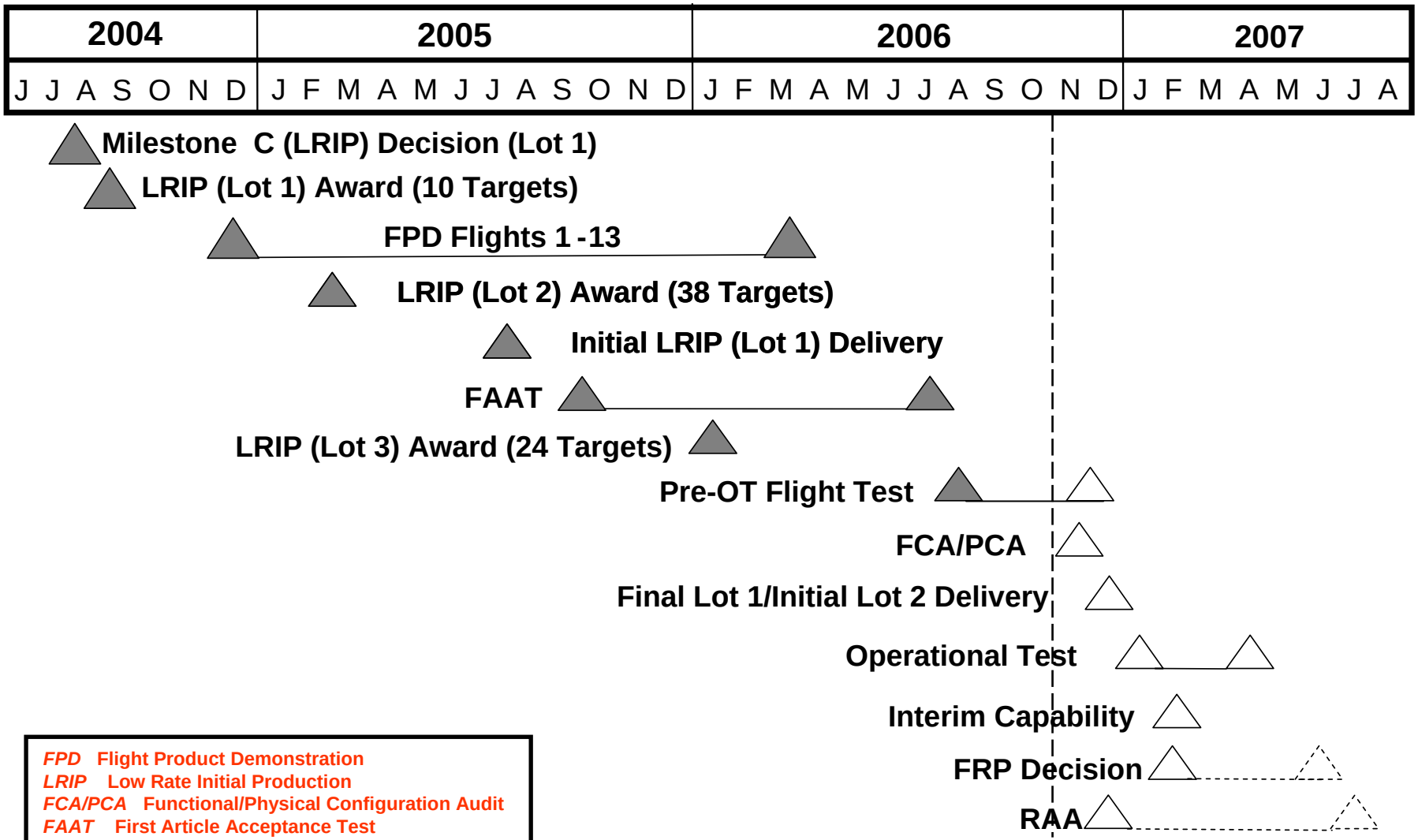
Description

- 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



AFSAT Schedule



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

Overview

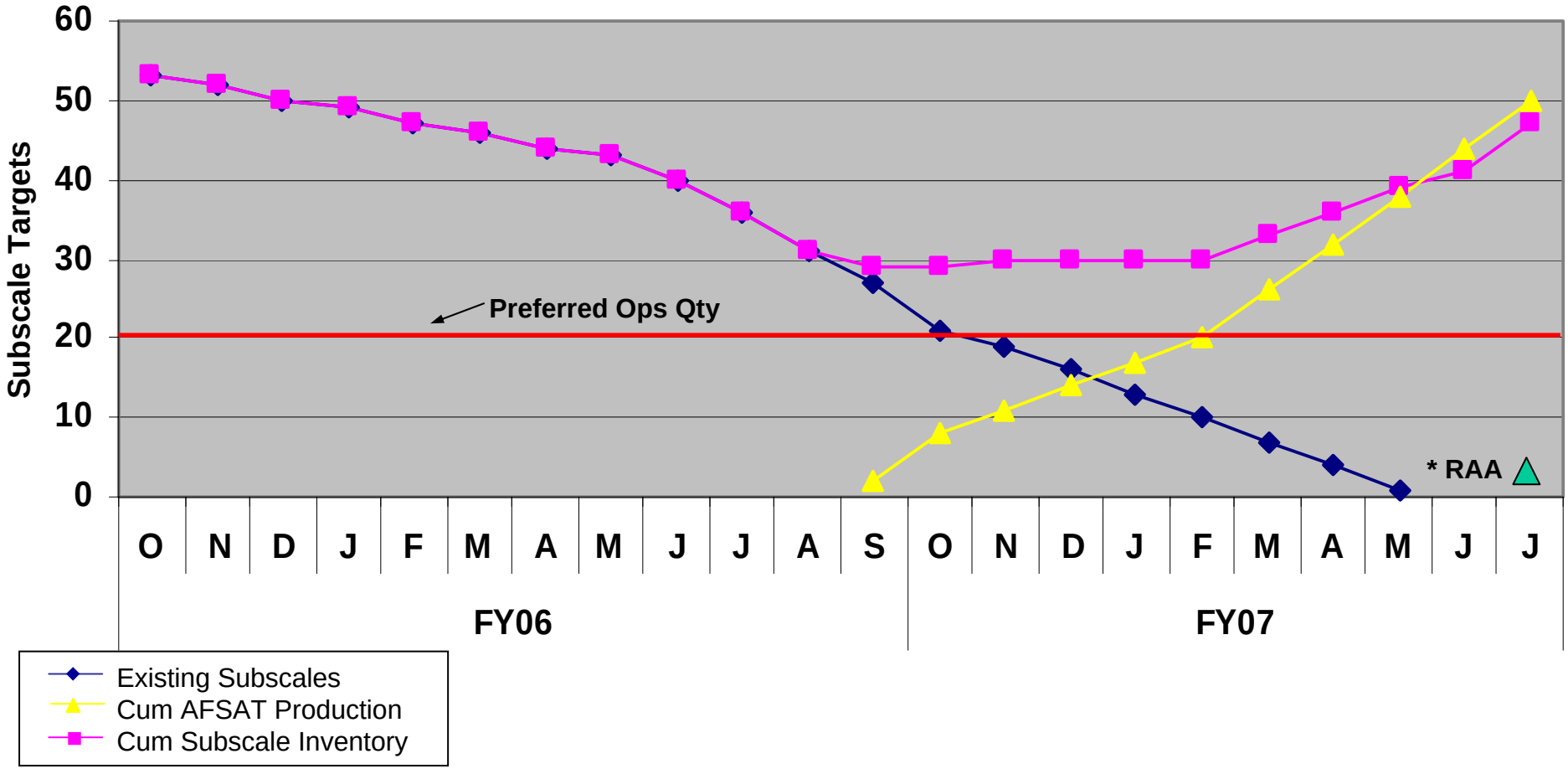
Flight Demonstration Successes

- 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



*** APB & EMA pending approval/signature**

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

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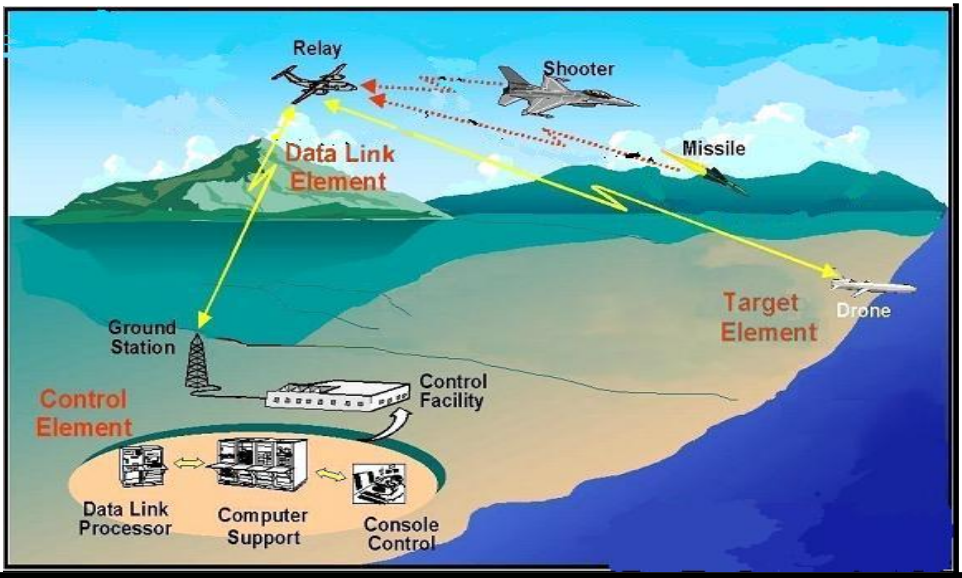
Summary

- 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 Manager: Everett Eblen
- Lead Engineer: Jim Lefebvre

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

Concern Areas

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