



**Air Force / Industry
F-35/F-22 Technology Interchange
Workshop
for
Small Business Innovation Research (SBIR)**

Plenary Session
28 November 2007



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14. ABSTRACT The Air Force Research Laboratory (AFRL) and the F-22/F-35 System Program Office, in conjunction with their industry partners, are conducted the first Air Force / Industry F-35/F-22 Technology Interchange Workshop for Small Business Innovative Research (SBIR). The workshop was on November 28-29, 2007 in Fort Worth, Texas. This dual-track initiative is an enabler for Air Force and Industry to collaborate and focus our collective R&D investment strategies to meet the electronic systems needs for the warfighter. The workshop kicked off with a general session discussion, whereby AFRL and F-35/F-22 addressed the Air Force S&T vision and strategic plans, as well as giving a comprehensive overview of the Air Force F-35/F-22 needs. The program then broke off into SBIR One-on-One Sessions.					
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AGENDA

<u>Time</u>	<u>Topic</u>	<u>Speaker</u>
1230 – 1240	Introduction	Mr. Clare Paul
1240 – 1250	Lockheed Welcome	Mr. Charlie Havis
1250 – 1315	AF/Industry Technology Interchange Workshop focused on F-35 & F-22	Mr. Chuck Plant
1315 - 1335	F-22 Overview	Mr. Doug Ebersole
1335 – 1355	F-35 Overview	Mr. John White
1355 – 1410	Break	-----
1410 – 1540	Case Study: F-35 Lighting II Inlet Duct Robotic Drilling Cell “Lessons Learned”	Mr. Lou Concha , Mr. Bob Heyer, Mr. Scott Gillette, Mr. Brett Bordyn, Mr. Joe Obrien, Mr. Bill Brown
1540 – 1555	Break	-----
1555 - 1610	AF Outreach Programs	Mr. Phil Roth
1610 - 1635	USAF Approach to Commercialization Pilot Program	Mr. Richard Flake
1635 - 1655	Future Funding Opportunities	Mr. Andy Lagrone
1655 - 1700	One-on-one session Rules of Engagement	
1700 – 1900	Networking Reception Poster Session	Sponsored by: 



***Welcome To The
Air Force / Industry
F-35 / F-22 Technology Interchange Workshop
for
Small Business Innovation Research (SBIR)***

F-35

F-22



Charlie Havis

F-35 Chief Engineer

The 100-Year Challenge



Supporting a/c designed 50 years ago while designing new a/c that will be flying 50 years from now...

...Will Require Strategic Partnerships That Drive Performance

Workshop Objectives:



Corporate Vision: *Powered By Innovation, Guided By Integrity, We Help Our Customers Achieve Their Most Challenging Goals*

- **Improve Our Connectivity with On-Going SBIRs**
- **Improve the Awareness of the Benefits of SBIRs and Leverage That Knowledge Towards the Provision of New Topic Ideas.**

F-22

Committed To Innovative and Enabling Technologies



- Robotic Drilling
- Hearing Protection
- PHM
- Engine Sensors and Materials

CTOL

STOVL

CV

***Road Mapping Exercises Will Help Define
Entry Points for Future Capabilities and Benefits***





AF/Industry SBIR Technology Interchange Workshop

focused on

F-35 & F-22

28-29 November 2007

Charles M. Plant, Jr.
Chief, Technology Transition Division
Requirements Directorate
Air Force Research Laboratory



Why Are We Here?

- To discuss
 - Product Center/AFRL Tech Needs ID/Solution Process
 - AF SBIR program information
 - F-35 & F-22 capability overviews
 - SBIR phase II case study
 - AF Commercialization Pilot Program overview
- To participate in pre-arranged one-on-one meetings between SBIR companies and F-35 & F-22 supply chain companies in order to facilitate technology transition

To Accelerate Technology Transition to F-35 & F-22 Community



Technology Transition

-- a multi-faceted hard problem



AF Technology Transition



- Technology transition: the use of technology in military systems to create effective weapons and weapon support systems*
- The S&T community focuses on transitioning affordable technology to acquisition and sustainment program managers which address user needs
- The S&T community uses several programs and processes to transition technology to address user needs
 - Advanced Technology Demonstrations
 - Advanced Concept Technology Demonstrations
 - Independent Research and Development
 - **Small Business Innovation Research program**
- * **Definition from *Manager's Guide to Technology Transition in an Evolutionary Acquisition Environment*, 31 Jan 03, Defense Procurement and Acquisition Policy Office of the Under Secretary of Defense**



Why is the AF SBIR Program Important?



- AF SBIR program the largest of the DoD agencies (approximately \$320 million)
- AF SBIR program provides a complement to The Air Force Research Laboratory's (AFRL's) exploratory and advanced development programs
 - SBIR program provides a rich source of technological innovation in a wide array of technology areas
 - Serves as potential feeders for follow-on Critical Experiments and Advanced Technology Demonstration Programs and to tech efforts focused on solving near and mid-term Product Center technology challenges

Business Segment	Small Business	Large Business
Table 1-1. Business Participants in DoD Technology Development*		
Dollars invested in industrial R&D, 2000	\$33 billion	\$148 billion
Percent of industrial R&D \$	18 %	82 %
No. of industrial patent filings in 1999	34,020	52,102
Percent of industrial patents filed	39.5 %	60.50 %

AF SBIR Program: Facilitates Technological Innovation for the AF Science & Technology Base



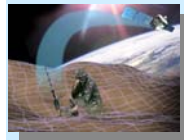
Good Requirements Key to Tech Transition*



Requirements



Technology



Industry



Acq/Log Centers



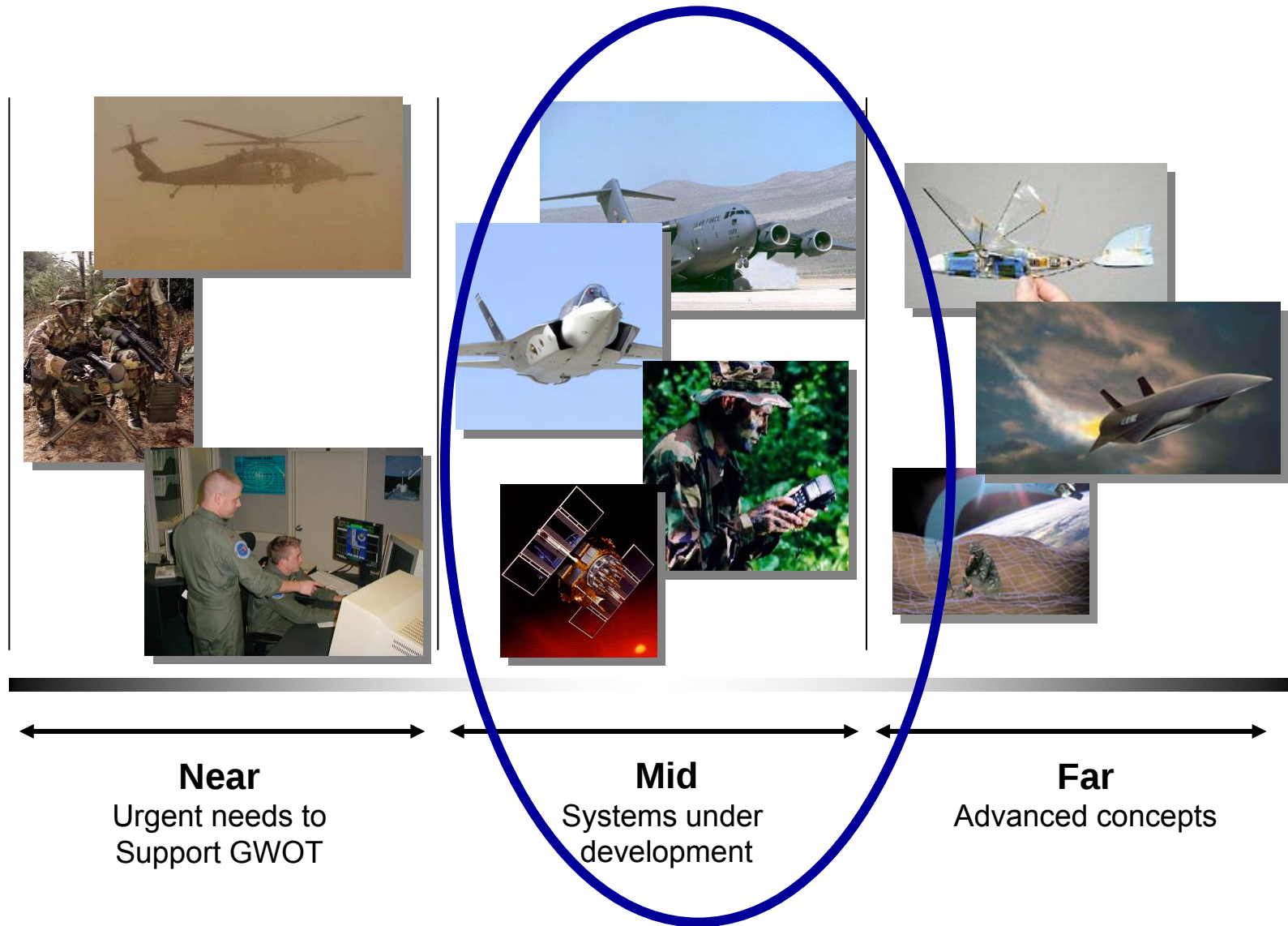
Customers



***... and Industry is the critical link to successful tech transition**

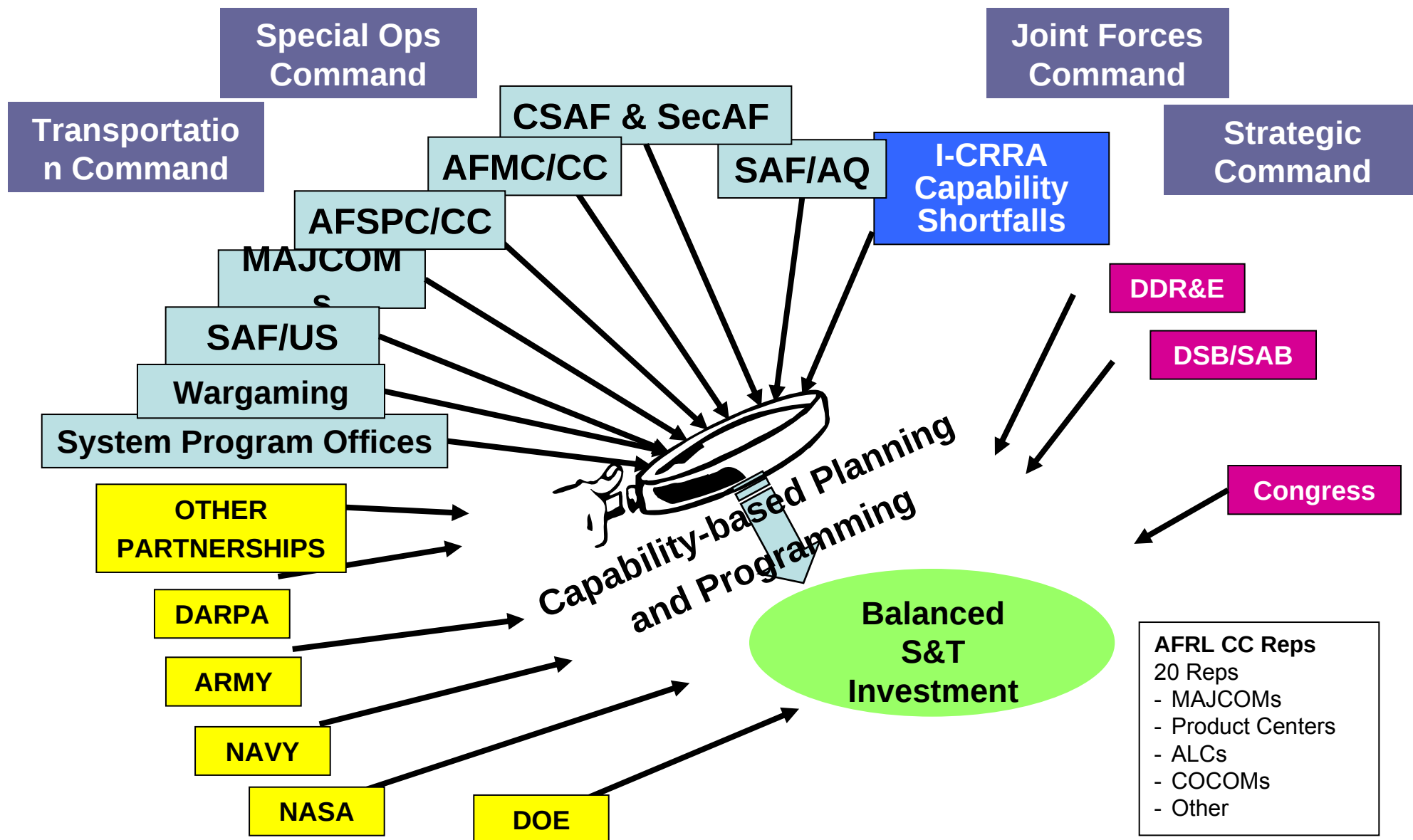


S&T Requirements Timeframe





Gathering S&T Requirements is a Challenge!





Requirements Collection



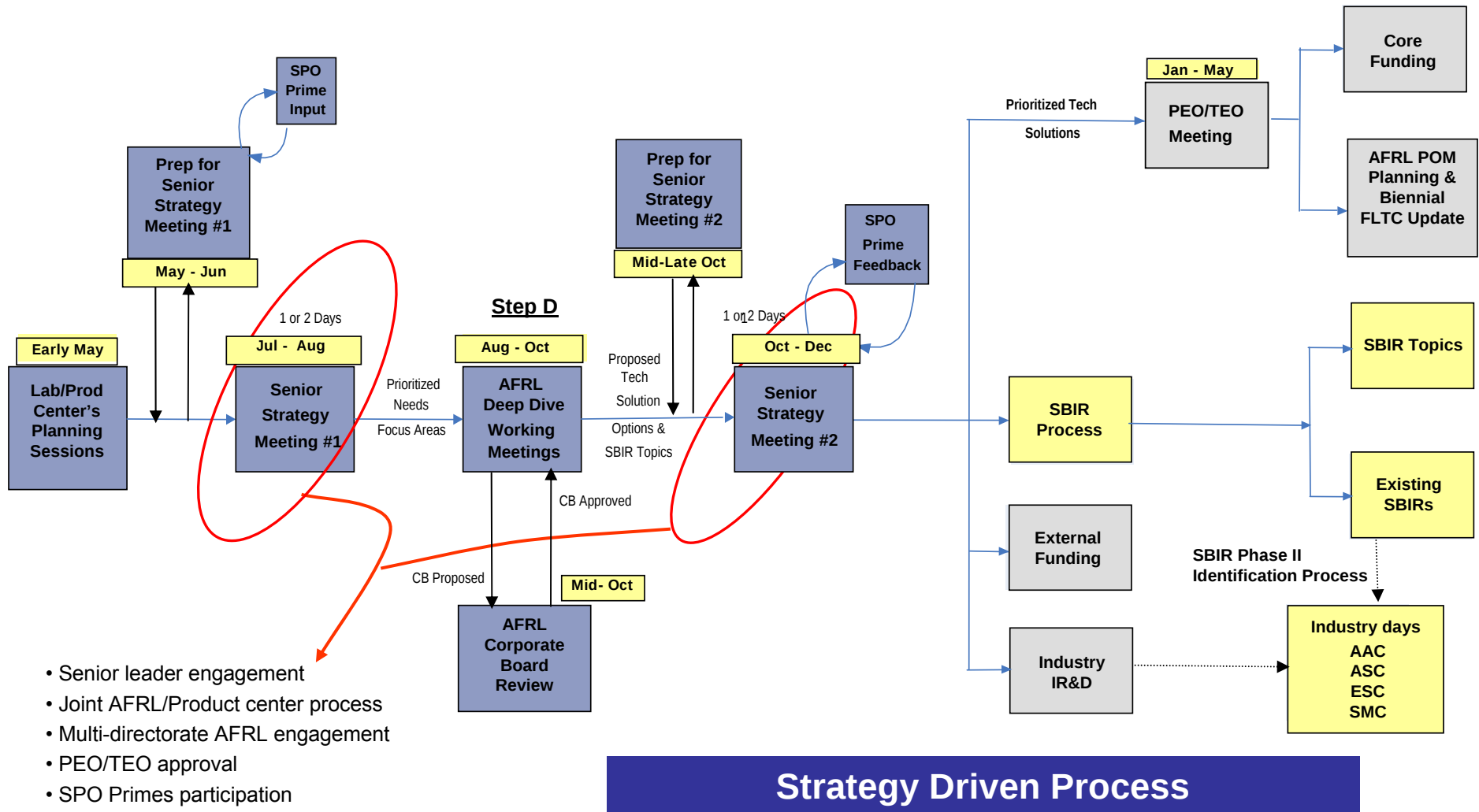
AFRL & Product Centers jointly developing a new process to

- identify high priority Product Center technology needs
- develop technology solution options
- feed results to
 - the Independent Research and Development (IR&D) program
 - the Small Business Innovation Research (SBIR) program
 - the AFRL POM

Expected to be incorporated in new AF Instruction



Air Force Product Center/AFRL Technology Needs Identification/Solution Process





AF SBIR Program

-- Background



- Designed to foster technological innovation by small businesses with 500 or fewer employees
- AF FY06 Stats
 - SBIR Program is \$320 M
 - Awarded 581 Phase 1 SBIR contracts from 4093 proposals received
 - Awarded 324 Phase 2 SBIR contracts from 347 proposals



- Section 252a of National Defense Authorization Act for FY06

Commercialization Pilot Program (CPP)

- AF hired support contractor (MacAulay-Brown, Inc.) to act as "transition agents" at four Product Centers plus F-22 and F-35





AF/Industry Technology Interchange Workshops -- SBIR



- **SBIR:** Air Force hosts one workshop per Product Center every year
 - “Match.com” service between Product Center Primes/Suppliers and SBIR Phase 2 Contractors
 - Targeted to Product Center top priority technology needs
- Coincident with IR&D event

SMC – April 07 / AAC – Sep 07 / F-22, JSF – Nov 07 / ESC – Jan 08 / ASC – FY

08



AF / Industry Space Technology Interchange Workshop – 20 Apr 07 -- SBIR



- “Match.com” service between SMC Primes/Suppliers and SBIR Phase 2 contractors targeted to SMC high priority technology needs
- Participation
 - 5 Prime Contractors
 - 43 Small Businesses selected by Primes for one-on-ones
 - 110 individual one-on-one sessions conducted
- Same day survey indicated successful first engagement!
 - 100% survey respondents indicated value-added
 - 74 Follow-up technical meetings planned



AF / Industry Air Armaments Technology Interchange Workshop – 12-13 Sep 07 -- SBIR



- “Match.com” service between AAC Primes/Suppliers and SBIR Phase 2 contractors targeted to AAC high priority technology needs
- Participation
 - 5 Prime Contractors
 - 51 Small Businesses selected by Primes for one-on-ones
 - 112 individual one-on-one sessions conducted
- Same day survey indicated successful engagement
 - 100% survey respondents indicated value-added
 - 50 Follow-up technical meetings planned



AF / Industry F-35 & F-22 Technology Interchange Workshop – 28-29 Nov 07 -- SBIR



- “Match.com” service between F-35 & F-22 Primes/Suppliers and SBIR Phase 2 contractors targeted to F-35 & F-22 high priority technology needs
- Participation
 - 12 Prime Contractors
 - 58 Small Businesses selected by Primes for one-on-ones
 - 184 individual one-on-one sessions conducted
- Same day survey indicated successful first engagement??
 - ??% survey respondents indicated value-added
 - ?? Follow-up technical meetings planned



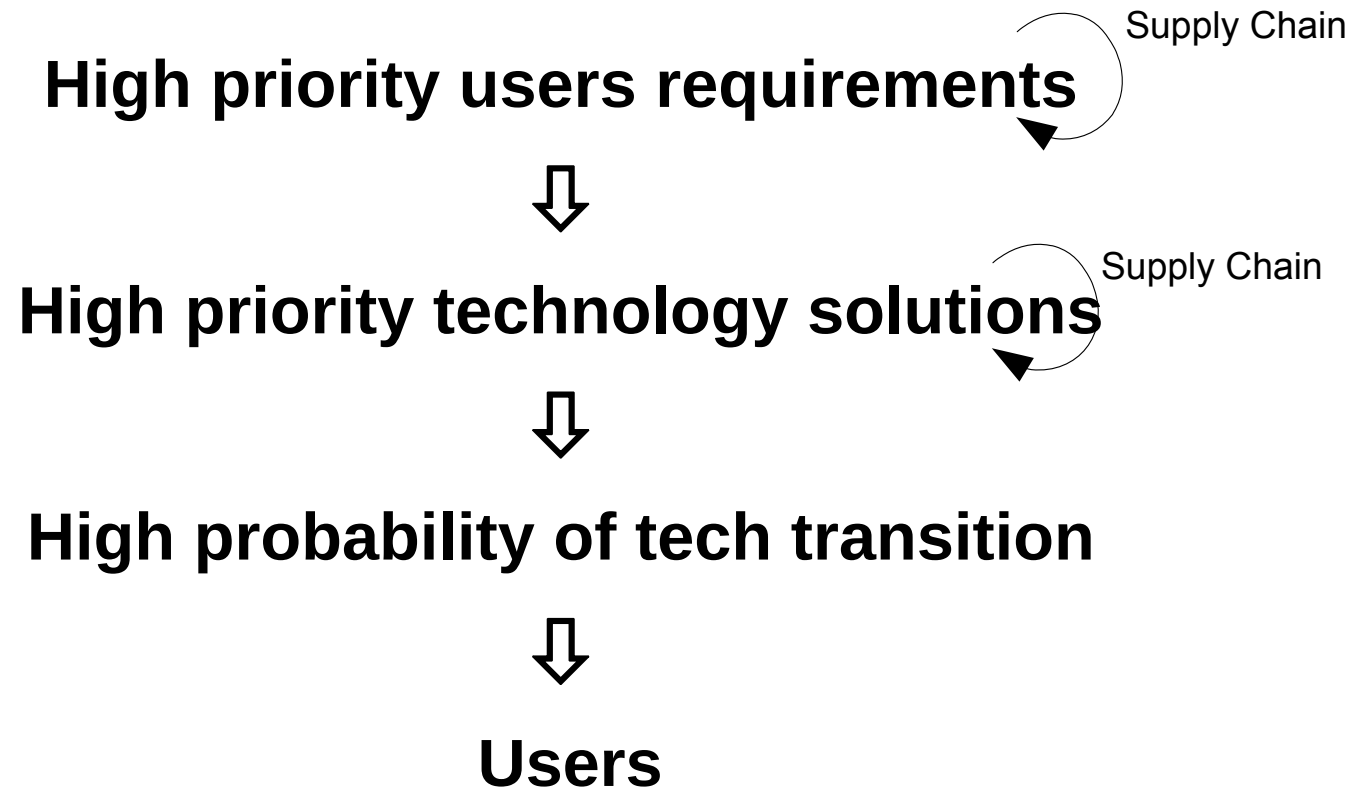
Other SBIR Accomplishments



- Allocated \$5M in FY07 (\$10M in FY08) for ManTech topics and corresponding ManTech topic focused solicitation in May
- Enhanced topic write-up review process to improve success through OSD SBIR topic review cycle
- Reduced SBIR Phase 1 contract award period (topic call to phase 1 contract award) from 532 days to 323 days
- Increased utilization of authority to award large Phase 2 contracts



Bottom Line



Communicate, Communicate, Communicate !!!!



AF SBIR Transition/Success Stories

... commercialization spin-offs



Oxygen Sensor



TauTheta Instruments, InterSpace, Physical Sciences

Objective: Develop an on-line oxygen sensor to determine the oxygen content of the air above the fuel in aircraft fuel tanks (C-17)

Commercial Use: To be adapted by large airliner manufacturers

Command and Control (C2) of Airlift Assets

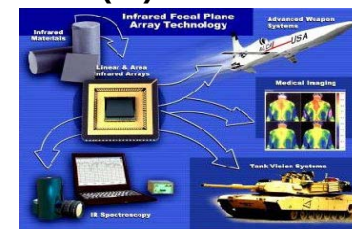


ConnectedWireless Corporation

Objective: Develop more effective C2 of strategic airlift and refueling aircraft in remote areas

Commercial Use: Company has become a fast growing innovator in supply chain management of hardware and software systems.

Infrared (IR) Focal Plane Array



Fermionics Corporation

Objective: Improve semi-conductor quality to in-turn improve performance of IR Focal Plane Arrays for numerous AF applications such as Space Based IR System (SBIRS)

Commercial Use: detectors used for medical imaging and the short-wave arrays are applied to paper automation machines

Heat Pipe Wick Structure



Thermacore International, Inc.

Objective: Develop compact and innovative cooling system for electronic components

Commercial Use: Thermacore's technology is found in almost all laptop computers sold today and has been used successfully to cool many other types of electronics.

Piezoelectric Vibration Dampening Material



Active Control Experts

Objective: Develop material that would dampen the vibration in turbine engines

Commercial Use: Licensed the technology to K2, a snow ski manufacturer that now sells the Merlin IV, made out of that exact material, for about \$750 a pair

New Coating Process Protects B-2 Engines From Ice Damage



Microphase Coatings, Inc.

Objective: SBIR- developed coating technology works to dramatically reduce ice ingestion in B-2 engines.

Commercial Use: Considering transfer of technology to other aircraft that present less demanding flight environments



Conclusion



- **AF SBIR Program has a record of successes**
- **Better communication of needs with product centers/ prime contractors, program offices and small businesses**
- **More focused direction of the entire SBIR program toward CPP model**
- **The SBIR program is a valuable tool in meeting our warfighter needs**



AF SBIR Program: Focused on Technology Transition



First Look, First Shot, First Kill



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F-22 is a unique combination of:

**No other aircraft
has all these
capabilities**

- Stealth
- Supercruise
- Integrated Avionics
- Maneuverability
- Weapons (air-to-air and air-to-ground)



Ensures air dominance in future combat operations



The System



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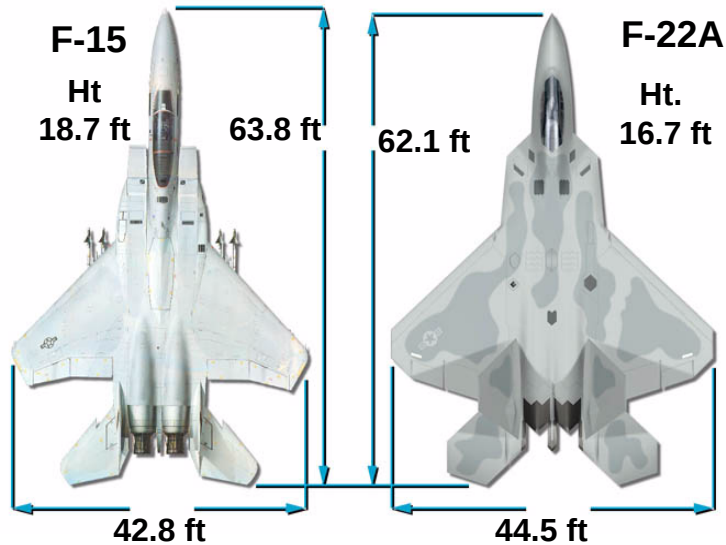


Aircraft Description



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- Low Observable/Highly Maneuverable
- Mach Number: > 1.8 Mach
- Supercruise (Mil Power): > 1.5 Mach
- Altitude: > 50,000 feet
- Engines: Two F119-PW-100
35,000-LB Class
Thrust Vectoring

• Armament Loadout:

(Air-to-Air)

(6) AIM-120C
(2) AIM-9M/X
20MM M61A2 Gun

(Air-to-Ground)

(2) AIM-120C
(2) 1000LB JDAMs
(2) AIM-9M/X
20MM M61A2 Gun



FIRST LOOK / FIRST KILL CAPABILITY

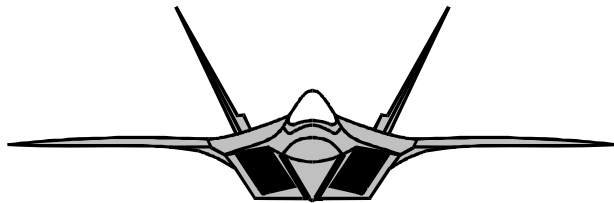


Stealth

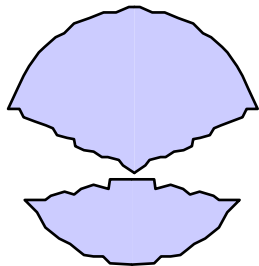


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Stealth Reduces the Enemy Kill Zone



**Conventional
Fighter**



**Stealth
Fighter**

- **A valuable tactical advantage**
 - Delayed detection
 - Reduced threat engagement envelopes
 - Reduced support force requirements
- **Designed in from the start**
 - Shape and materials allow dramatic observability reduction
 - Improved maintainability



Supercruise



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The ability to maintain supersonic speeds for a significant period of time

- Allows F-22 to rapidly range the battlefield
- Reduces fuel consumption
- Increases weapons envelopes
- Reduces surface-to-air missile (SAM) engagement envelope

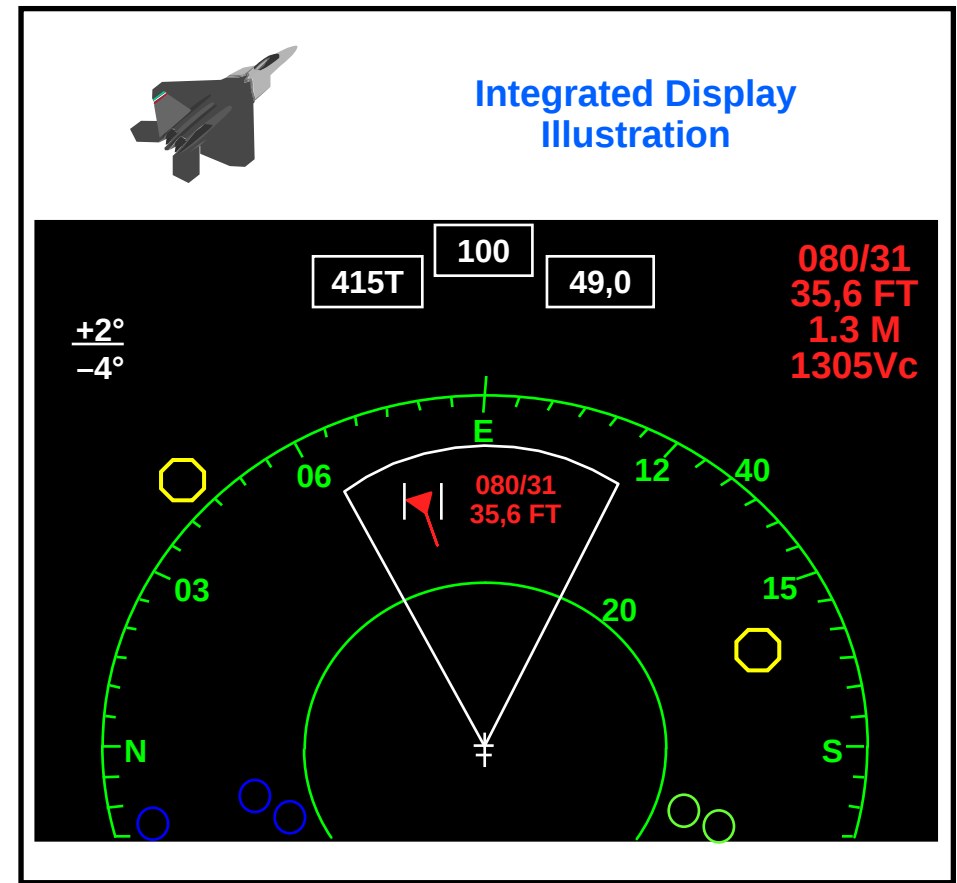
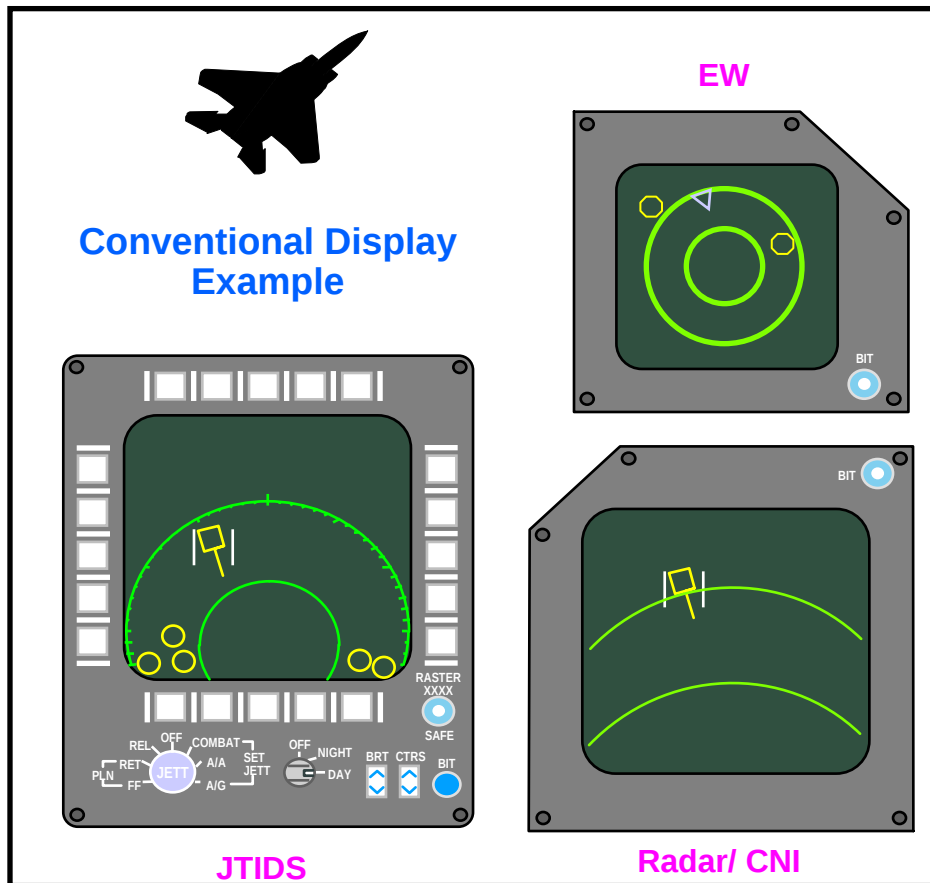


Integrated Avionics



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Sensor fusion is a revolutionary step forward



Maneuverability

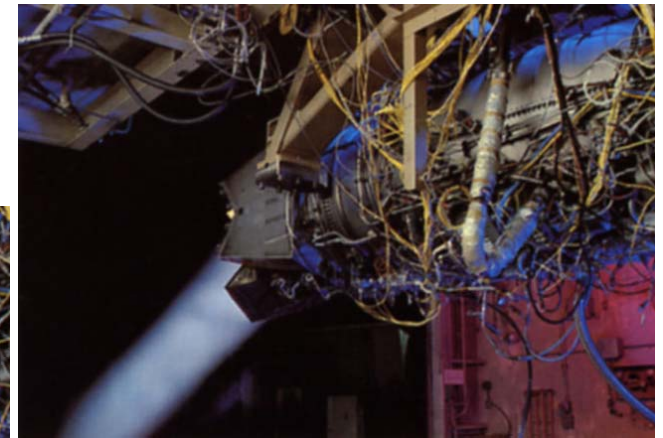
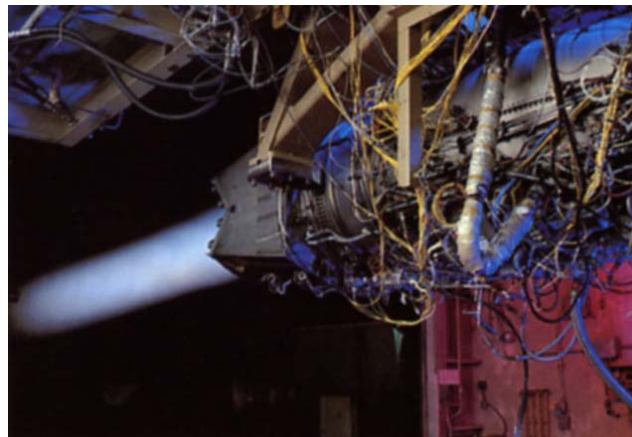
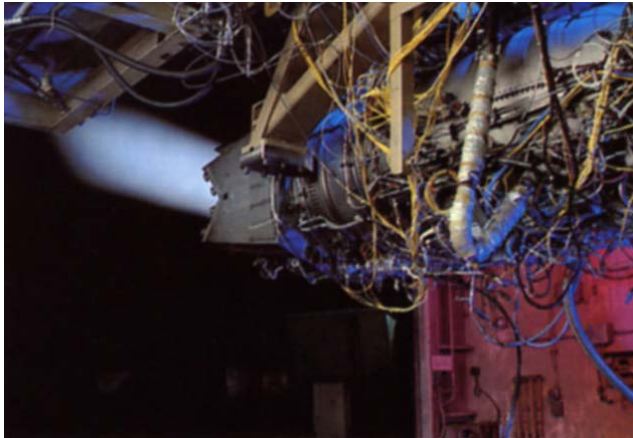


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Thrust Vectoring



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The Program



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F-22 Program Schedule



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FY 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13

Milestones

Demonstration / Validation

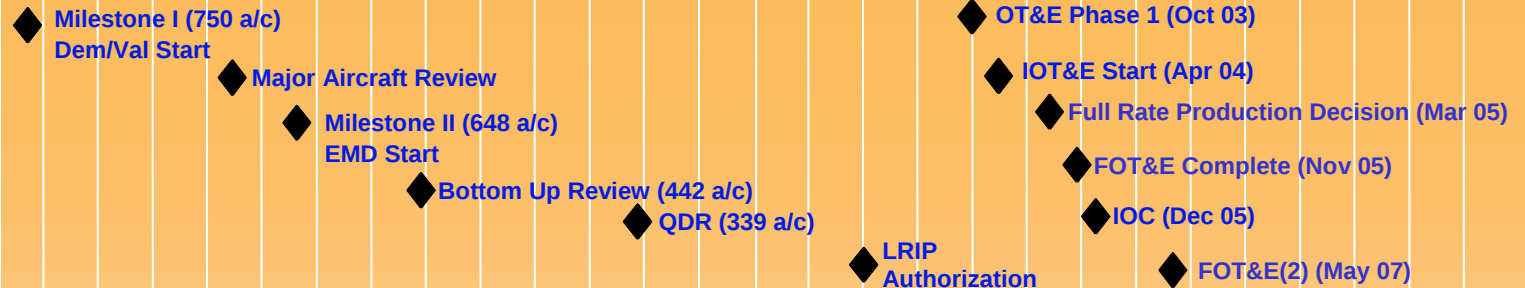
Engineering and Manufacturing Development

Production Representative Test Vehicles

Production Quantities

Sustainment

Beddown



YF-22 First Flight 9/90

YF-23 First Flight 8/90

First Flight EMD

9 Flight Aircraft

(1 Static and 1 Fatigue Aircraft)

T&E/
OT&E

381 + Obj

LRIP (1-5)

FRP (6-9)

Lot Delivery Quantities

FY07 PB 10 13 21 22 24 24 20 20 20

Lot 1 2 3 4 5 6 7 8 9

Annual PALS/FS&T

Long Term PBL

Nellis Tyndall Langley Elmo Hmn Hickam



* Lot 6 quantity includes RTA

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How goes it in 2007?

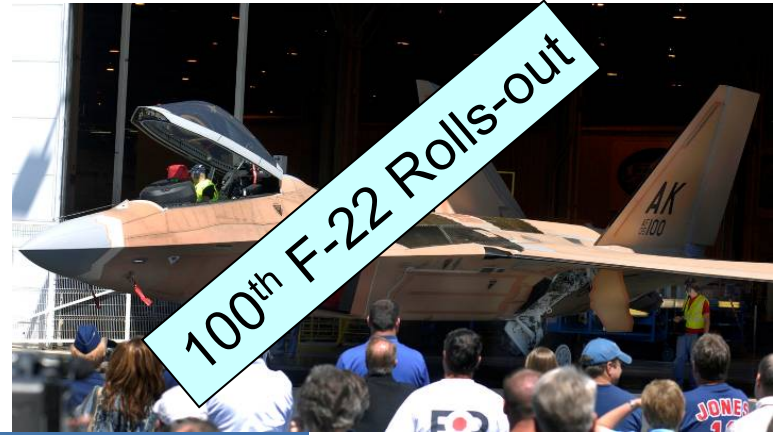


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First F-22 Multi-year Contract



100th F-22 Rolls-out



F-22's Permanently in AK



First F-22 deployment overseas
First Red Flag participation



F-22 wins Collier Trophy

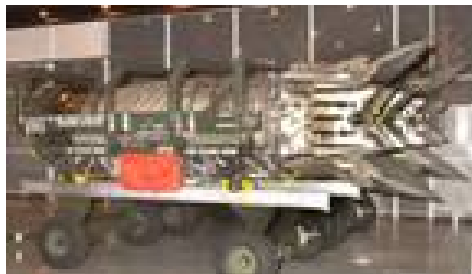


Iron On the Ramp



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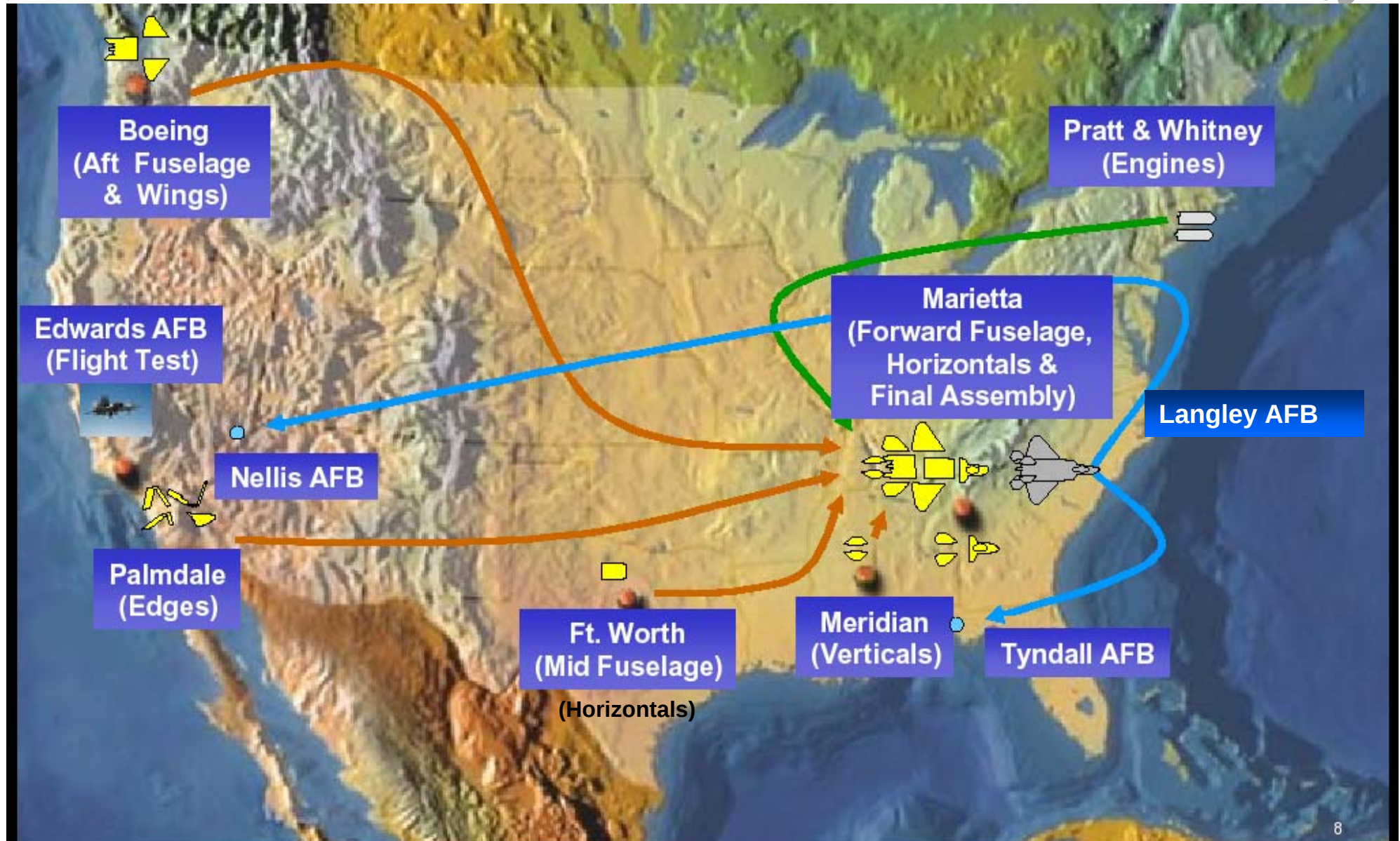


Top Level Manufacturing Flow



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Lot 1 – 5 Contract Schedule Performance

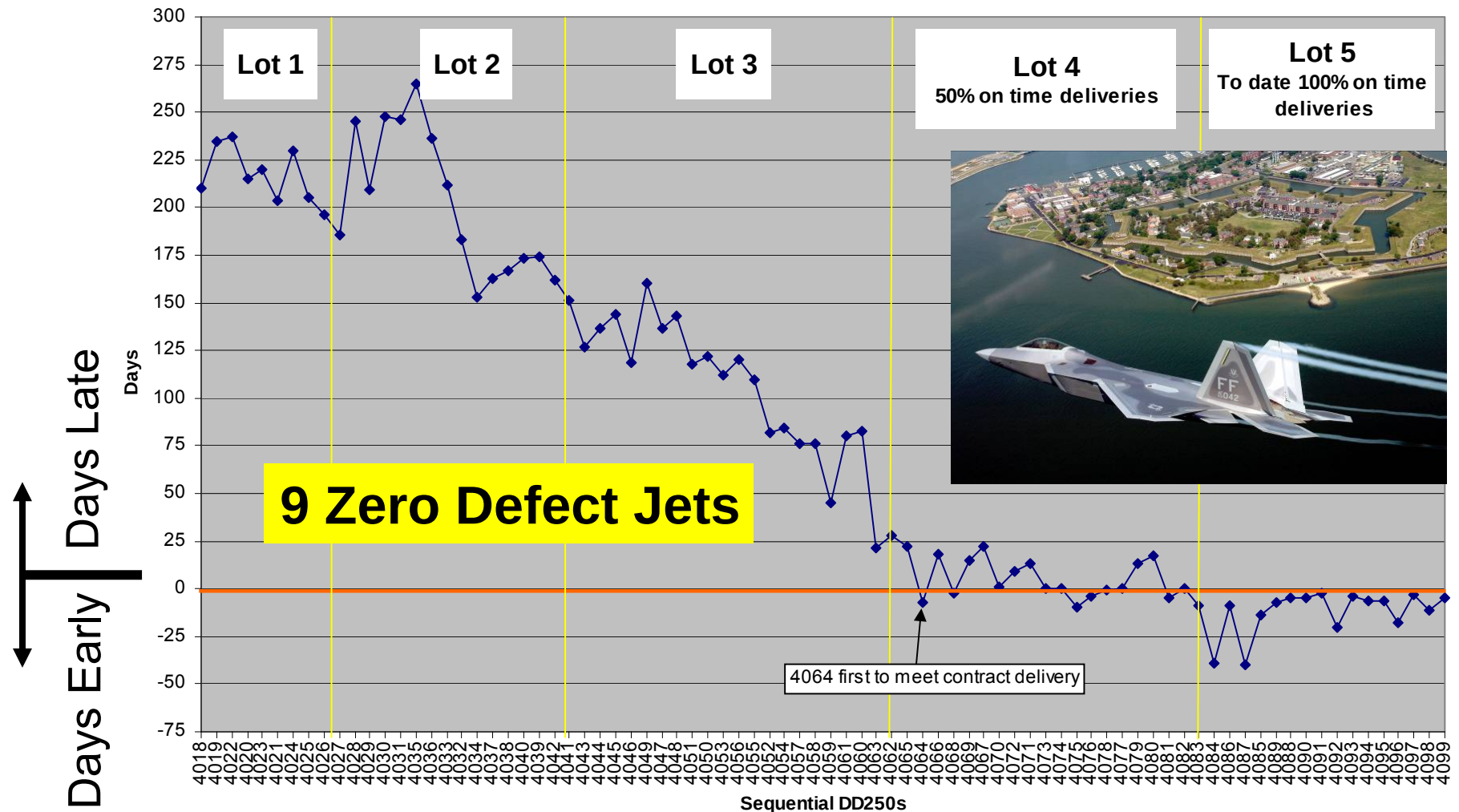


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Variance from contract





Keep 'em Flying



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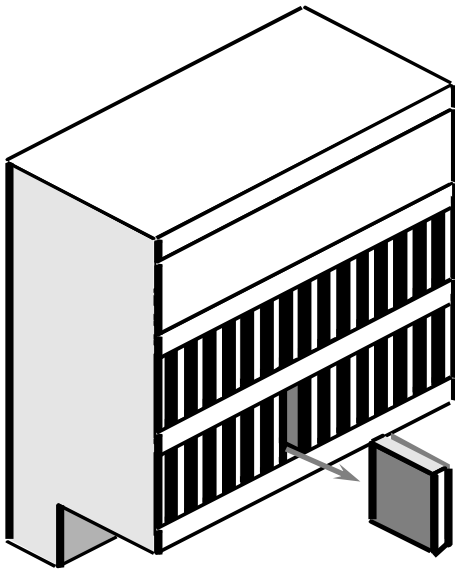


2-Level Maintenance Concept



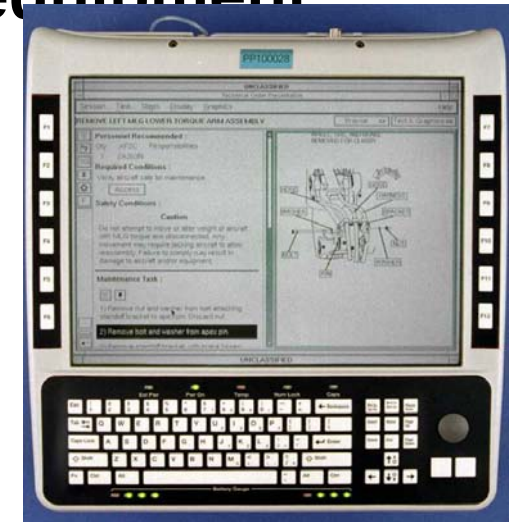
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- 2-level maintenance
 - F-22 design optimized for 2-level maintenance
 - Intermediate level moved into the aircraft **NOT** to the depot
 - Limited O-level off-equipment maintenance

- Maintainer effectiveness further enhanced by:
 - Interactive Technical Data
 - Integrated Maintenance Information System





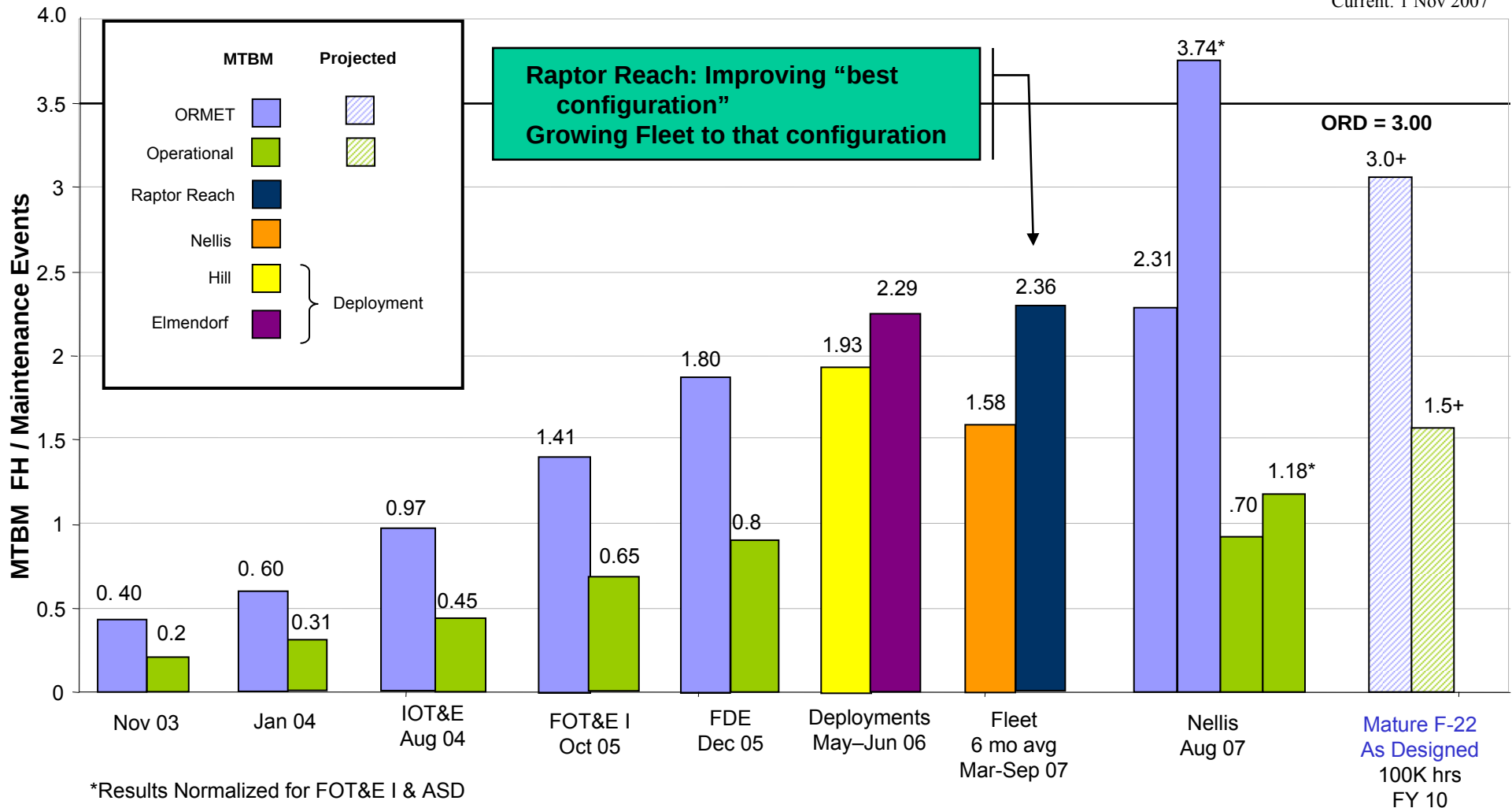
Mean Time Between Maintenance Growth to 3.0 at Maturity



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Current: 1 Nov 2007





F-22 Basing



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Modernize the Fleet



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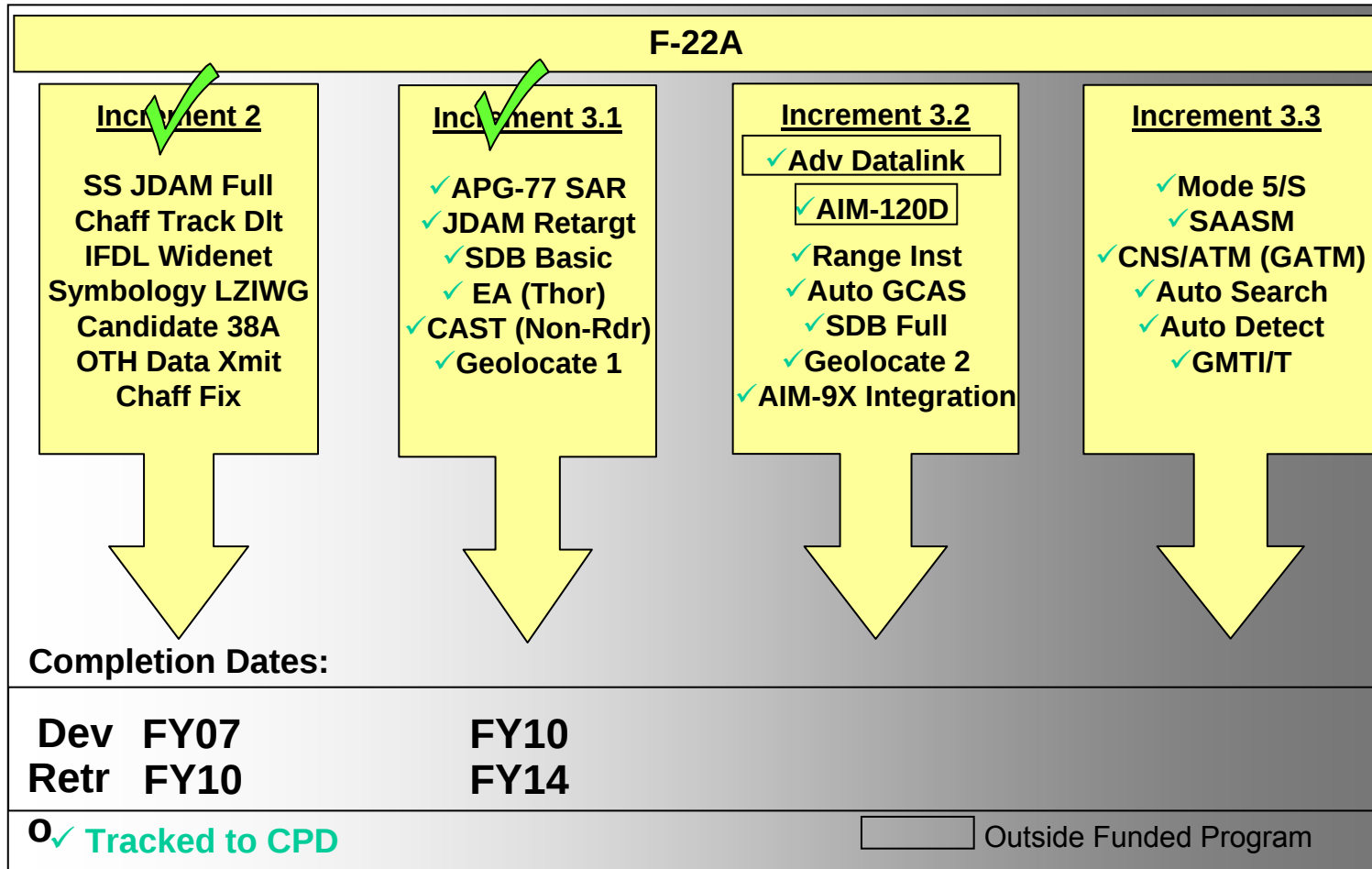


F-22 Modernization Plan



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F-22 Modernization Ongoing



What It's About



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USAF Statement to Congress - 27 Jan 2005

"The Operational Effectiveness of the F-22 Is Overwhelming, Demonstrated by the Raptor's Ability to Operate Against Adversary Ground and Air Defenses With Impunity. Ground Defenses Could Not Engage the F-22, nor Could Adversary Aircraft Survive."

A photograph of four F-35 fighter jets flying in a staggered formation against a dramatic sky at sunset or sunrise. The sun is low on the horizon, creating a strong glow and casting long, horizontal rays of light through the clouds. The clouds are dark and textured, with the light from the sun highlighting their edges. The jets are white with dark markings on the wings and tails. The word "Questions?" is written in a large, black, serif font in the upper right quadrant of the image.

Questions?

K. Chandler



F-35 Overview

F-22/F-35 SBIR Workshop

28 November 2007

Mr. John White

Director of Engineering

F-35 Lightning II Program



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Deliverance!



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VISION

DELIVER AND SUSTAIN
THE MOST ADVANCED, **AFFORDABLE** STRIKE FIGHTER AIRCRAFT TO
PROTECT FUTURE GENERATIONS WORLDWIDE.

MISSION STATEMENT

BE THE MODEL ACQUISITION PROGRAM FOR JOINT SERVICE AND
INTERNATIONAL COOPERATION.
DELIVER TO OUR WAR FIGHTERS AN **AFFORDABLE** AND EFFECTIVE
NEXT GENERATION STRIKE FIGHTER WEAPON SYSTEM AND SUSTAIN
IT WORLDWIDE.



Overview



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- **Program Overview**
- **JSF and SBIR**
- **JSF and Small Business**
- **Summary**
- **Questions**





JSF Family Of Aircraft

One Program -- Three Variants
Meeting Service and International Needs

Conventional Take-Off and Landing (CTOL)

In-Flight Refueling
Door (Boom)

Internal
25mm 4-Barrel
Gatling Gun

Short Take-Off and Vertical Landing (STOVL)

Probe and Drogue
Refueling (Basket)

Lift Fan

Roll Posts

Carrier Variant (CV)

Probe and Drogue
Refueling (Basket)

Strengthened
Landing Gear
and Tailhook

Wingfold and
Ailerons Added

3-Bearing
Swivel Nozzle

Larger Wing and
Horizontal Tail Area

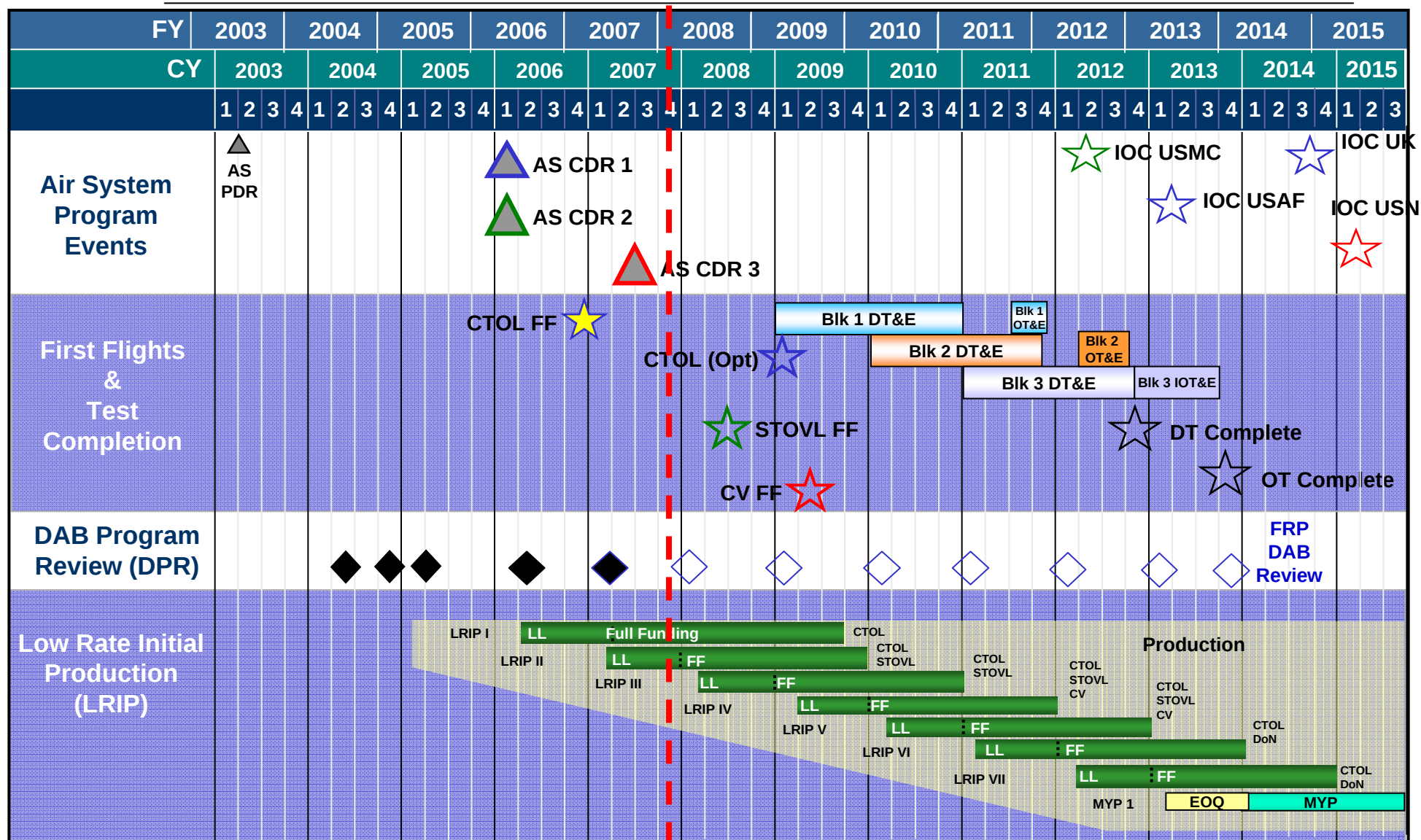
Centerline
Gun Pod
with 25mm Gun

All variants

- 450-600 nm Range
- 1.6 Max Mach (Limit)
- Stealthy
- Same Weapons
- Similar Avionics
- Similar Flight Envelope
- Same Basic Engines



JSF Top-Level SDD Program Schedule





Major Accomplishments



AA-1 in Flight Test

- First Flight: 15 Dec 06
- 19 Total Flights (as of 29 Oct 07)

CATB

- First Flight: 23 Jan 07
- CNI integration flights start on 27 Nov 07

Production Status

- 15 Aircraft in production
- First STOVL rollout planned for 18 Dec 07

Subsystems Development on Track

- Radar, WE/CM and ICNI working in MS Integration Lab
- Mission system sensors flying on test beds

F135

- 8,462 total hrs on 12 engines (as of 29 Oct 07)
- Completed STOVL inlet angularity testing and gearbox durability demo
- Delivered first STOVL lift fan and engine for BF-1

F136

- 518 total hrs on 2 engines (SDD & Phase IIIB)
- Complete Initial Fan and Augmenter testing on Engine 002/24 (Oct 07)

Coalition

- All 9 Participants have signed MOU – completed 27 Feb 07

BF-1

- STOVL on track for first flight 23 May 2008





JSF Engine Interchangeability



- **Physically** and **Functionally** Interchangeable
- Any Aircraft Able to Use Any Engine
- Common JSF Autonomic Logistics System Interfaces



PRATT & WHITNEY F135

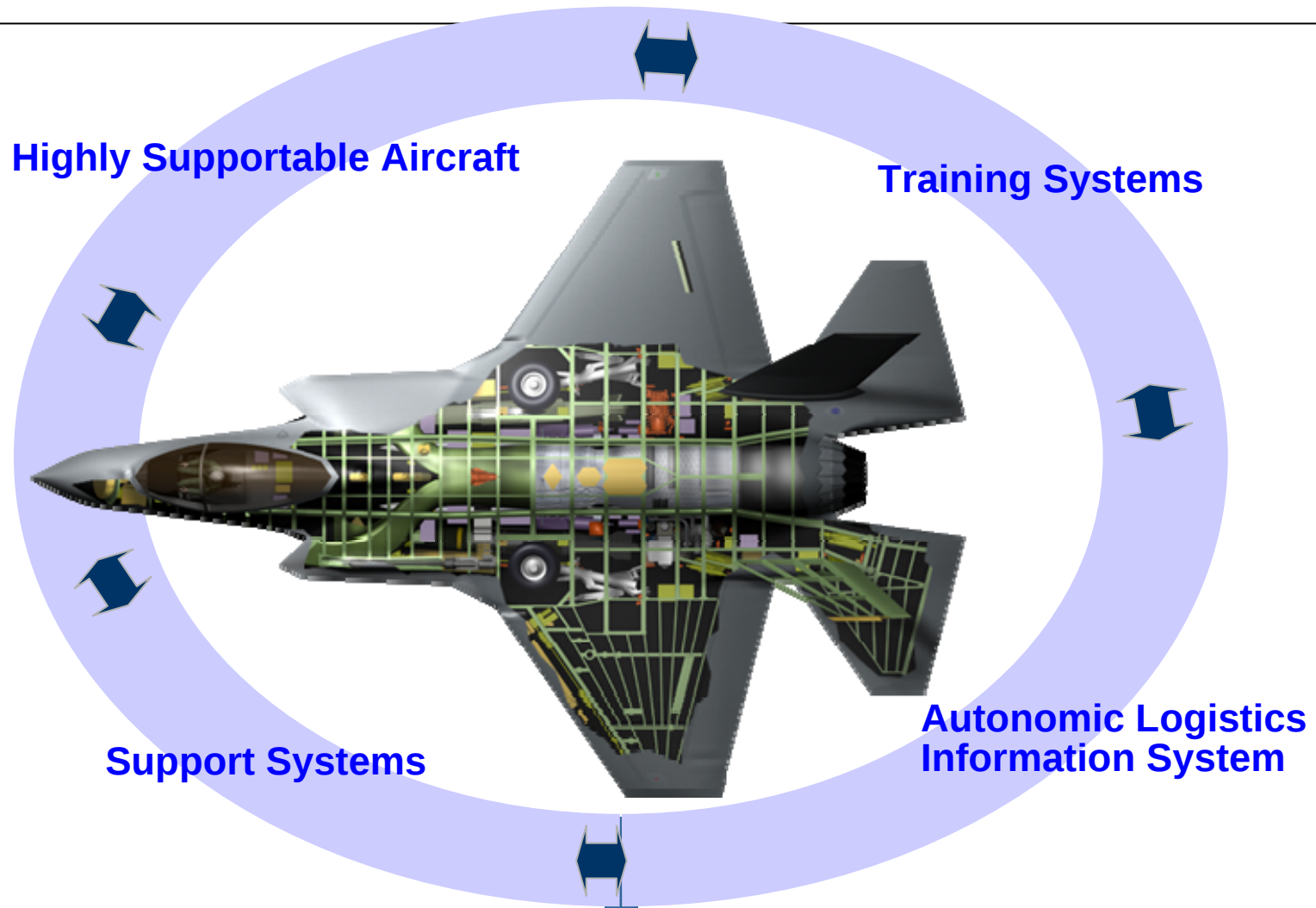
**GE AIRCRAFT ENGINES/
ROLLS ROYCE F136**



***JSF Engines - - Common Core for Aircraft
Variants, Competition in Production***



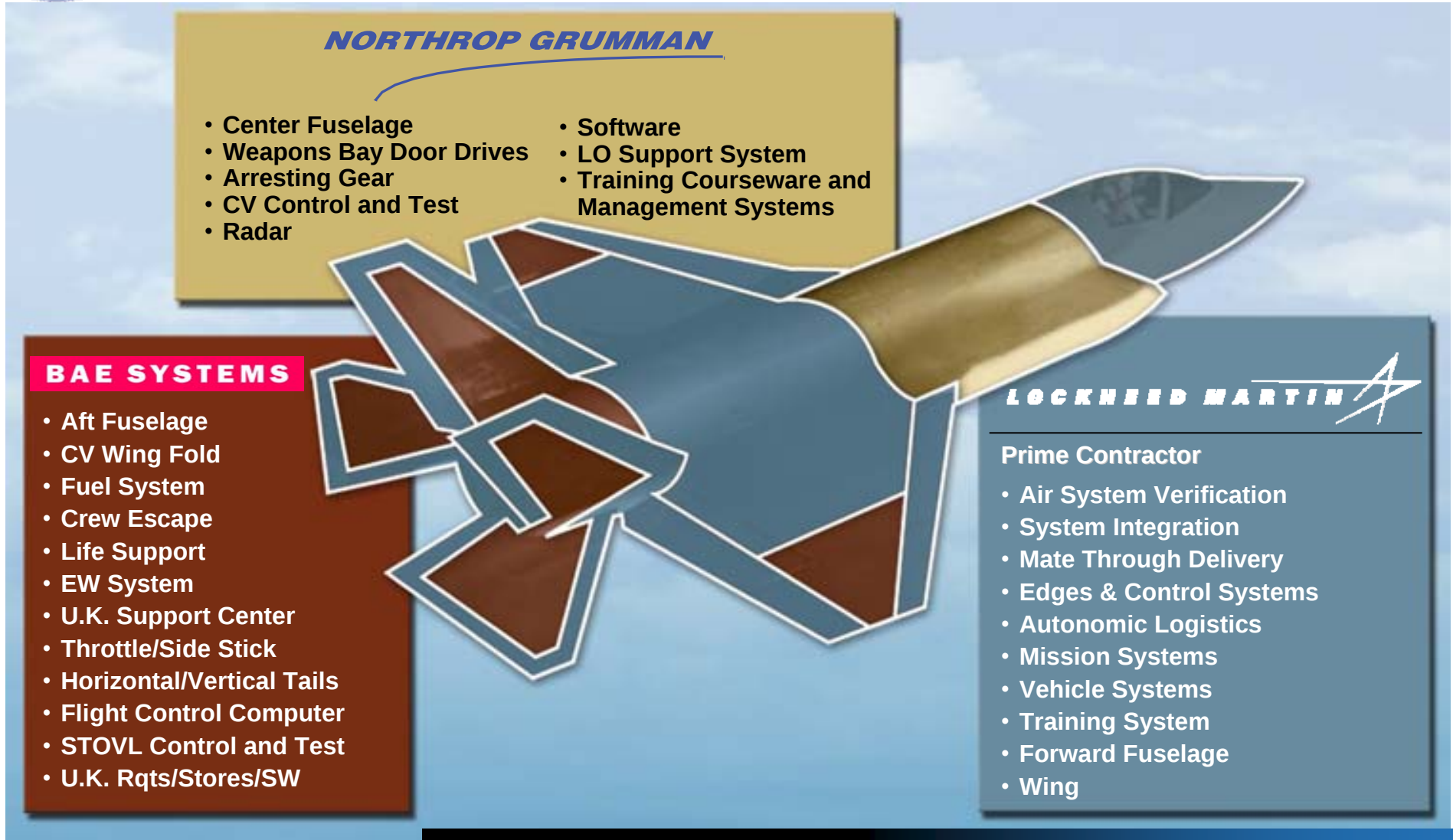
JSF Autonomic Logistics System



Autonomic Logistics Provides Order Of Magnitude O&S Savings



Lockheed Martin JSF Team



A Highly Integrated Best Value Team



Overview

- Program Overview
- JSF and SBIR
- JSF and Small Business
- Summary
- Questions



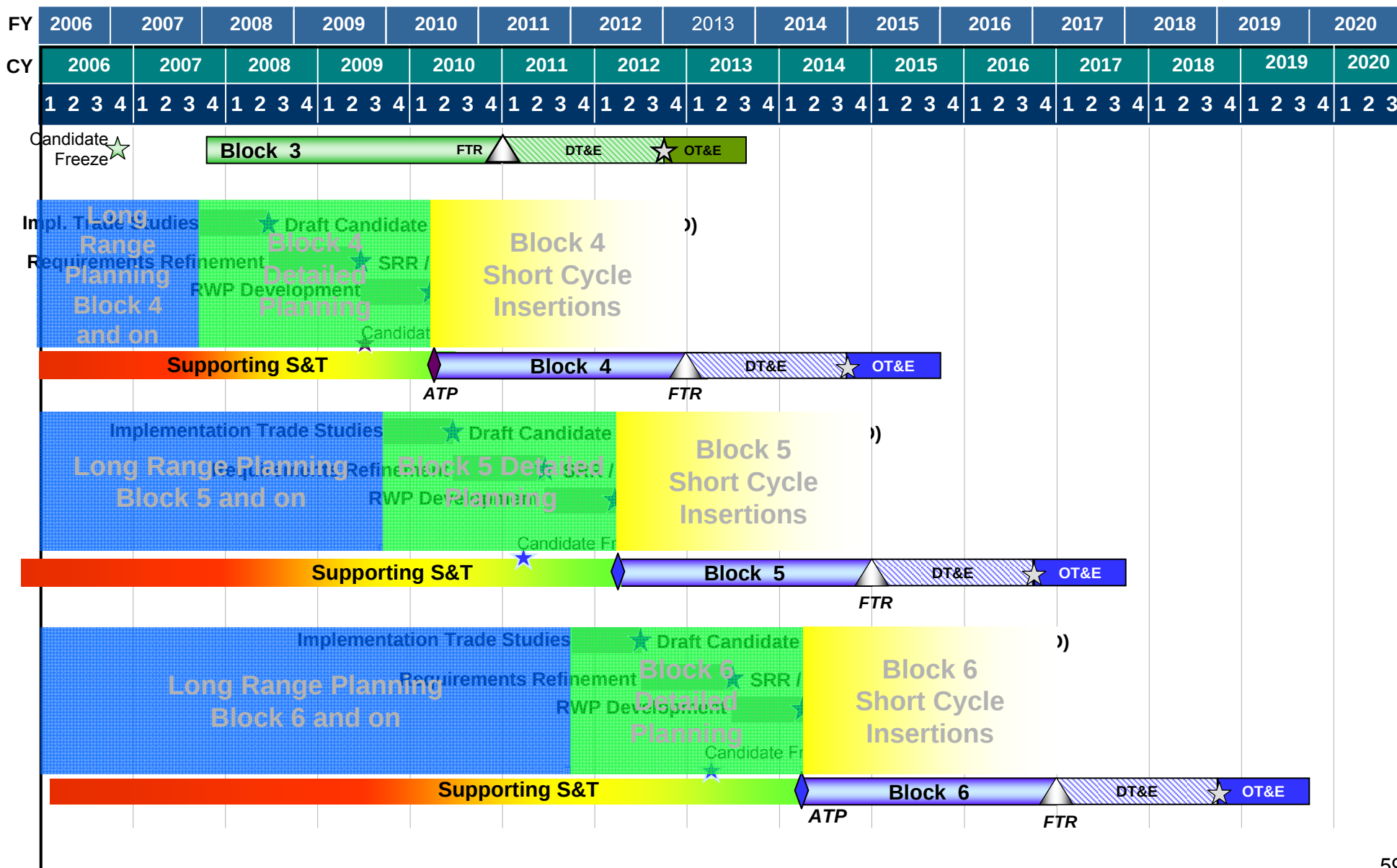
JSF Small Business Innovation Research (SBIR) Program

- JSF is transitioning from basic aircraft design in SDD to Follow-on Development with technology insertion in 2 year Block increments
- To date SBIRs have contributed to JSF in broad basic design areas that include:
 - engine materials
 - hearing protection
 - robotic drilling
 - environmental materials
 - PHM



Post-SDD Block Increment Planning Timelines

"Technology Insertion Points"





Follow-on Development - Platform Contractor/JPO are doing our Homework

- **Contractor/JPO are developing Roadmaps to show**
 - **What** the warfighter's needs are – COCOM Gap Analysis
 - **Where** are we going in “focus areas”
 - **When** SBIR technologies need to fit into the JSF S&T roadmap
- **SBIRs must buy their way into the JSF Air System**
 - **Measurable** IMPROVED performance, reliability & maintainability and/or supportability basis
 - **A solid business case**, i.e. REDUCED URF (Unit Recurring Flyaway Cost), Total Ownership Cost, and ROI (Return on Investment)?
- **JSF S&T Planning Document**
 - Provides technology needs, priorities and schedule
 - Available on request as appropriate



Leveraging External Funding

- **JSF Program funds very limited for SBIR transition**
- **Need to establish the tech transition path to the platform early on through prime contractor and sub-prime involvement**
 - JSF is a Total System Performance Responsibility (TSPR) program. No technology makes it on the jet without the Prime and Sub-prime's concurrence!
- **Focus is to leverage non-JSF funding for Phase III transition such as:**
 - Service programs
 - Warfighter Rapid Acquisition Program (USAF WRAP)
 - Rapid Technology Transition (USN RTT)
 - Manufacturing Technology (USAF & USN MANTECH)
 - SBIR Commercialization Pilot Program (CPP)
 - DoD Programs
 - Technology Transition Initiative (TTI)
 - Defense Acquisition Challenge Program (DACP)
 - Foreign Comparative Testing (FCT)
- **There will be further discussion on alternate funding sources this afternoon**



Technology Roadmap Needs

- **Air System Core Capability**
 - Collision Avoidance
 - Cockpit Automation
 - Embedded Training
- **Air-to-Surface**
 - Combat ID
 - Locate Targets in Complex Environments
 - Small Weapon Precision Kill
 - Improved Battle Damage Assessment



Technology Roadmap Needs

- **Air-to-Air**
 - Combat ID
 - Longer Range
 - Passive Threat Detection

- **Electronic Combat**
 - Threat Detection
 - Active Countermeasures
 - Electronic Attack
 - Directed Energy Effects



Technology Roadmap Needs

- **Interoperability and ISR**
 - LPI Networks
 - Information and Resource Management
 - Improved Bandwidth
 - Battle Management
- **Airframe and Infrastructure**
 - Propulsion (Fuel/Thrust)
 - Reduced Weight
 - Thermal Management
 - Mass Storage Capacity
 - Electric Power and Power Electronics



Technology Roadmap Needs

- **Supportability and Sustainment**
 - Fault Detection and Isolation
 - Non-skid Coatings
 - Diagnostics, Prognostics, and Health Monitoring
 - Environmentally Safe Primers and Coatings
- **Manufacturing and Producibility**
 - Span Time Reduction
 - High Temperature Materials
 - Assembly Automation
 - Supportable and Affordable LO Technologies



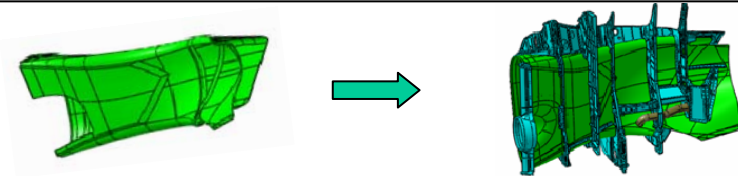
Success Stories

F-35 Inlet Duct Drilling Cell

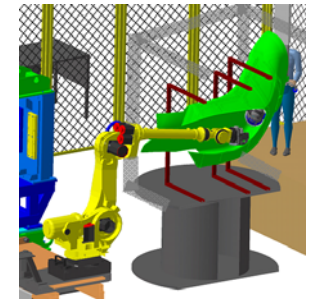


OBJECTIVE – Combine SBIRs to create an integrated robotic drilling cell for cost effectively drilling F-35 Inlet Ducts

- **PHASE I** – Demonstrate components of the robotic cell
- **PHASE II** – Integrate the components into a total robotic drilling cell and demonstrate the cost effective approach for drilling duct
- **TOTAL PROGRAM** is a \$4.1 M effort

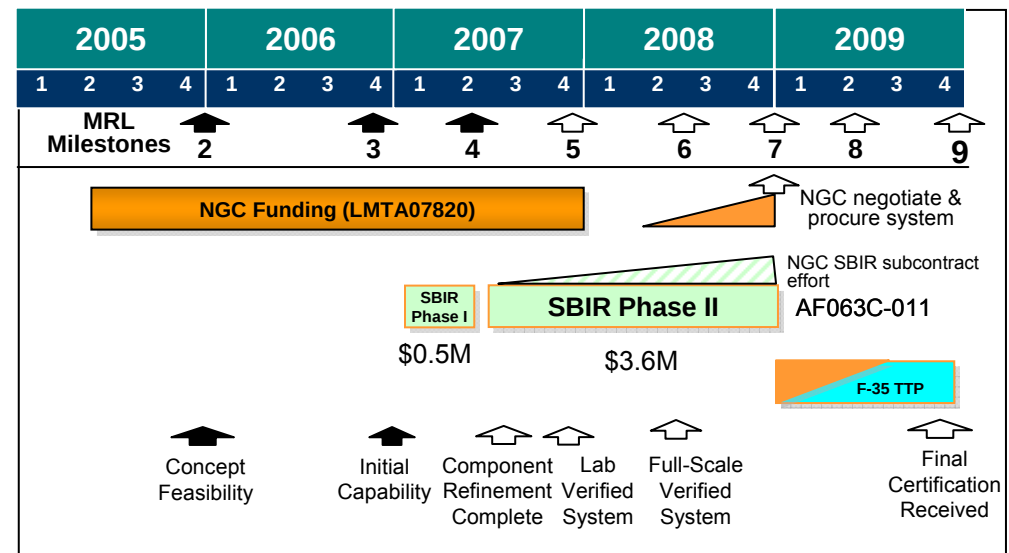


Drilling inside ducts & attaching frames around the duct is ergonomically difficult with excessive span time



APPROACH

- END USER (NGC) actively involved in entire process from generating requirements to contracting the end item robotic cell at completion of Phase II
- 5 PHASE I SBIR contracts awarded & 2 teams evolved – component designs defined & some demos in labs & with software simulations
- 1 PHASE II SBIR awarded 7 Sep 07 for integrated robotic cell – 16 month activity
- Production Robotic cell to be delivered & certified in 2009 for production incorporation





Success Stories

F-35 Inlet Duct Drilling Cell



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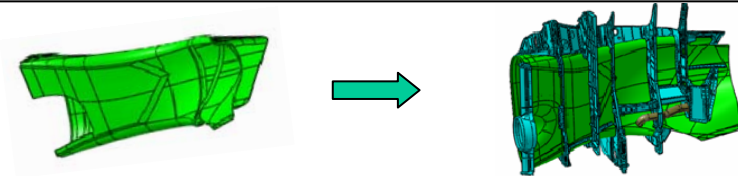
2. APPROACH – Active involvement by supplier from the start

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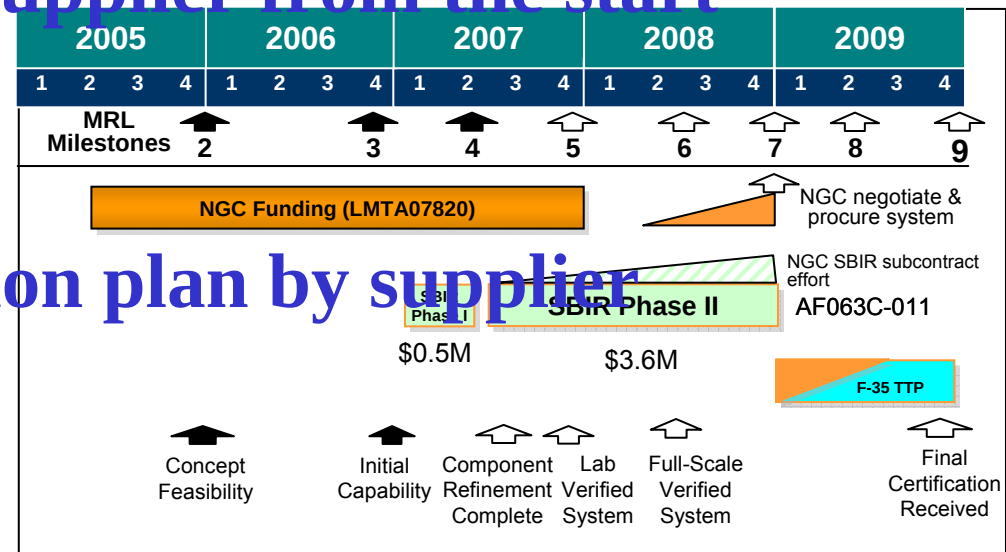
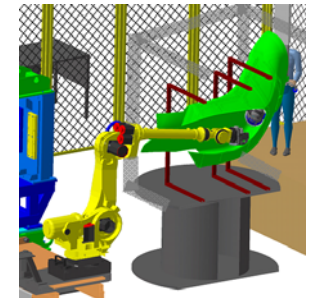
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Active & Passive Noise Reduction Technology to Improve Speech Intelligibility and Reduce Noise for Helmet Mounted Systems

NAVAIR SBIR PROGRAM - Topic# N01-162 & N02-151 – PHASE III -TECHNOLOGY

OBJECTIVE – Develop significantly improved hearing protection for NAVY carrier flight deck personnel

- Solid passive earplugs
- Active Noise Reduction (ANR) earplugs
- Communications earplugs
- Improved Earcup custom foam inserts
- Improved Digital Noise Canceling (DNC) microphone for flight deck communications

Sponsorship

- NAVAIR
- PEO(JSF)



TPOC (COTR)

James Wilt
Phone: (301) 342-8839
James.wilt@navy.mil



MILESTONES

- JSF Lockheed Martin \$5M contract for hearing protection device Apr 05
- 260 prototype solid earplugs delivered & currently under test Feb 07
- Demo -42 dBA passive plug double hearing protection Feb 07
- Demo -48 dBA w/ANR & earcup Apr 07
- Critical Design Review completed Jun 07
- Final testing complete Mar 08

TRANSITION & PROCUREMENT

- Improved earcup w/custom foam inserts & solid passive earplugs providing ~42 dBA protection AVAILABLE NOW
- ANR earplugs available with improved earcup providing ~48 dBA protection AVAIL in Apr 08
- PMA 202 seeking FY08 procurement funds for ANR protection devices – FY10 funding budgeted
- UK Royal Navy & Ministry of Defence considering adopting ANR earplug technology for their new CVF carrier

Company: Adaptive Technologies, Inc.
2020 Kraft Drive
Blacksburg, VA 24060

www.adaptivetechinc.com
Phone: 540-951-1284

POC: Dr. William Saunders
E-mail: will@adaptivetechinc.com



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Phone: 540-951-1284

POC: Dr. William Saunders
E-mail: will@adaptivetechinc.com



SBIR Summary

- **JSF is significantly invested in the SBIR program**
 - We look for external Phase III Transition Assistance
- **JSF is planning the transition from SDD to Follow-On Development**
- **JSF will map SBIRs to our S&T roadmap at definable transition points**
- **JSF PEO, Prime and suppliers must coordinate SBIR topics to improve Phase III transitions**
- **JSF is actively working new transition opportunities within the SBIR process for targeted programs to receive more \$ during phase I and II**
- **In order to participate in JSF's future, small business must interface with Lockheed Martin and its suppliers**



JPO Small Business and SBIR POCs

- **For SBIR and small business information or questions:**

JSF Program Office

- Dr. Jim Alper (703) 601-5516, james.alper@jsf.mil
- Clare Paul (937) 656-6560, clare.paul@jsf.mil
- Lars Wallis (703) 413-4734, lars.wallis.ctr@jsf.mil

Lockheed Martin Aerospace

- Craig Owens 817-777-6504, craig.l.owens@lmco.com

We are always looking for good SBIR topic ideas!

**We will work hard for necessary funding to transition technologies
that make sense!**



WORKING TO AFFORDABLY MEET THE REQUIREMENTS OF THE WARFIGHTER



JSF **JOINT STRIKE FIGHTER**
the next generation strike fighter



Questions?

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited



Overview

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Reduced URF

- **High Speed Precision Laser Assisted Machining of Silicon Carbide Ceramic Matrix Composites**
 - Develop and demonstrate high-speed, precision, laser-assisted machining processes and/or tooling for silicon carbide based ceramic matrix composites (CMCs)
- **Rapid Method for A/C Fastener Surface Preparation**
 - Metallic fasteners are hand abraded to prepare the surface for primer application. An alternative process is desired to save labor hours and associated hazardous materials expense
- **Rapid Prototyping Process for Ceramic Cores for Investment Castings**
 - Develop rapid prototyping processes to use for the production of detailed, geometrically stable cores for investment castings
- **Direct Part Manufacturing using Selective Laser Sintering (SLS)**
 - Investigate and validate direct part manufacturing technology for nonstructural components in aerospace applications
- **Mold In Place Coatings**
 - Define and demonstrate an improved method for precision application of coatings directly onto aircraft



Improved Capability

- **Conformal Sensor Window**
 - Create techniques for grinding, polishing, and measuring aspheric, corrective infrared-transmitting optics for use with conformal windows and aerodynamic domes. Corrector elements might not have rotational symmetry
- **Very Wide Bandwidth Aircraft Radomes**
 - Design and develop an aircraft antenna capable of operation at frequencies from 30 MHz to 2 GHz, without significant impact on aerodynamics, and designed to occupy the smallest practical surface area at the lowest weight practical
- **Wide Bandgap Amplifier Linearization**
 - Reduce intermodulation distortion in wide bandgap solid state amplifiers that result from multi-tone input signals
- **Pulse Interleaving Radar Modes**
 - Develop innovative pulse interleaving techniques to facilitate the multiple simultaneous mode operation in Naval radar systems in order to improve situational awareness in a littoral environment
- **Ogive Phased Array Transmitter for Jammers**
 - Determine the feasibility of using non-planar arrays for wide-band, high-power jamming transmitters
- **Impact of Long Duration wear of the JSF Helmet Mounted Display**
 - Establish measurement techniques to determine the physical and cognitive effects of long duration wear of the JSF head mounted system in order to optimize pilot performance in the JSF tactical maneuvering environment
- **Binaural Capture and Synthesis of Ambient Soundscapes**
 - Create a technique for capturing and replicating ambient soundscapes, and use the technique to statistically model ambient soundscapes for a wide range of listening environments.
- **High Temperature PM Actuator Motor**
 - Increase temperature capability of compact electrical actuators, and demonstrate prototype permanent magnet motor through full operational temperature range of actuator
- **Manufacturing of New Active Noise Reduction and Intelligible Communication System for use in Extreme Noise Environments**

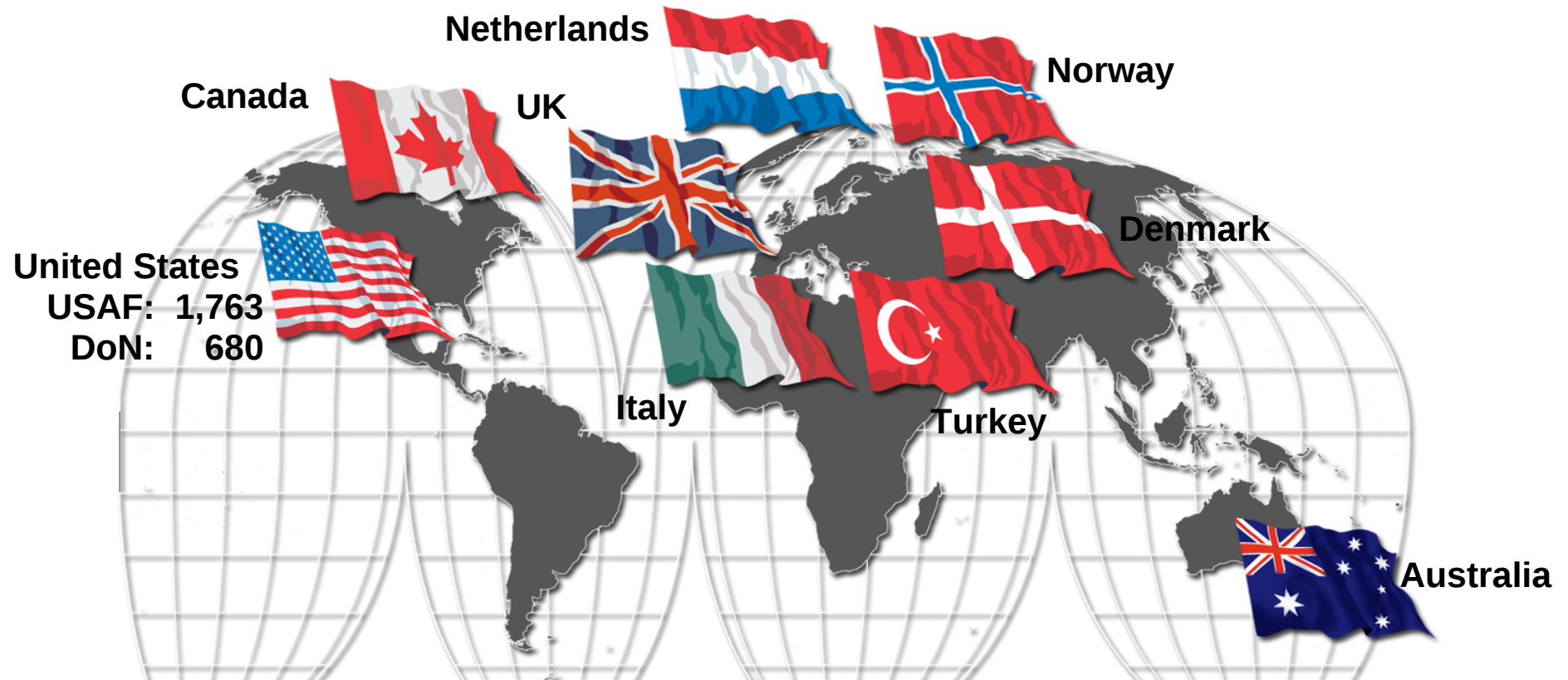


Reduced Life Cycle Costs

- **Innovative Method for Strain Sensor Calibration on Fleet Aircraft**
 - Develop a method to calibrate strain sensors on in-service fleet aircraft to be used in individual aircraft structural life tracking
- **Thermally Stable High Energy Lithium-ion Batteries for Naval Aviation Applications**
 - Develop thermally stable high energy Lithium-ion battery technology for Navy aircraft in order to meet increasing power and energy demands, satisfy mission operational temperature requirements, and provide increased reliability while reducing weight
- **Inconel Blisk Repair Technology**
 - Develop enabling technology that delivers a practical weld repair solution that will meet or exceed fatigue requirements of Inconel airfoils in an integrally bladed rotor (IBR)/blisk
- **Thin Film High Temperature Sensors**
 - Design and develop a thin film sensor that is low profile, conformal coated and can be applied to retro and forward fit applications
- **High Temperature Sensing Parameters**
 - Develop high temperature sensing devices that measure parameters other than temperature and pressure, such as heat flux, flow, strain, and gas species
- **Starter / Generator Efficiency Enhancement**
 - To develop technologies that reduce the thermal burden of electrical starter/generator systems in high-performance tactical aircraft by improving their efficiency
- **Wear Resistant Coatings for Aircraft Structures**
 - Develop wear-resistant coatings for aircraft structures
- **Modeling and Simulation for the Development of Robust Ceramic Matrix Composite Manufacturing Processes**
 - Develop modeling and simulation tools for the melt-infiltration process to facilitate robust ceramic matrix composite (CMC) manufacturing processes
- **High Temperature Abrasion Resistant Coating**
 - Develop a high-temperature, abrasion-resistant coating with 450°F continuous use temperature for aircraft outer mold-line applications
- **Innovative Coating Removal Techniques**
 - Develop removal techniques for coatings that are innovative. Need on-aircraft external coating selective removal process. Removal process cannot damage aircraft structure or underlying primers



Service & International Needs



- **USAF:** Multi-role (primary air-to-ground) fighter to replace F-16 & A-10 & to complement F/A-22
- **USMC:** Multi-role, short takeoff, vertical landing strike fighter to replace AV-8B & F/A-18C/D
- **USN:** Multi-role strike fighter to complement the F/A-18E/F
- **UK (RN and RAF):** Supersonic replacement for Sea Harrier and GR-7

2,593 US/UK JSFs > 2,000 International JSFs



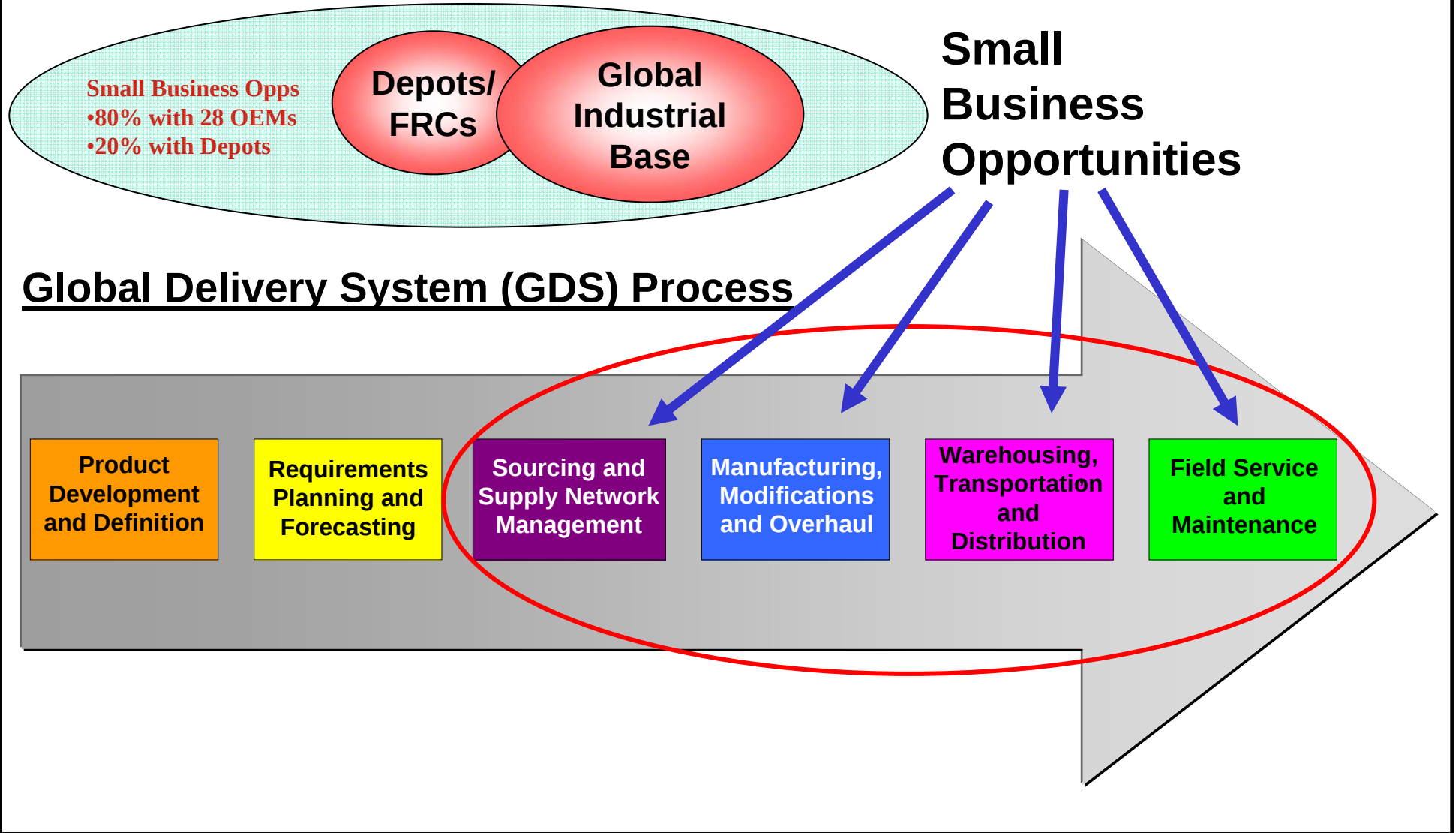
F-35 Global Supply Chain



Lockheed Martin Aeronautics Company



Where Can Small Business Play?





JSF Small Business Subcontracting Acquisition Strategy

- **JSF is committed to providing opportunities for small businesses to participate in the development and production of the JSF Air System**
- **LMAC, P&W and the FET contracts with JSF contain Small Business Comprehensive Subcontracting Plans**
- **JSF has tailored the award fee clause to create incentives in the area of subcontract management for small business**



Overview

- **Program Overview**
- **JSF and SBIR**
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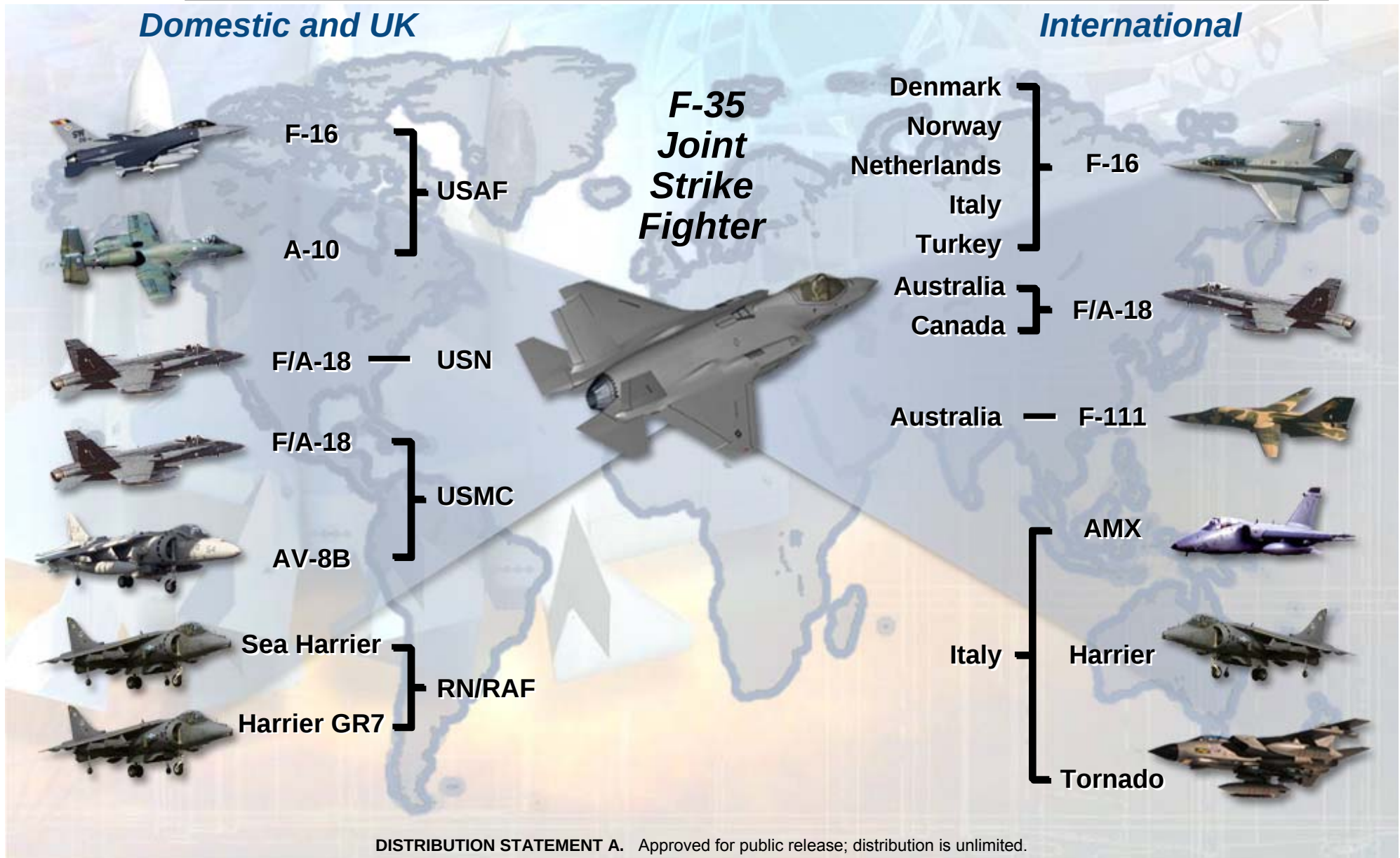
General Small Business Summary

- **F-35 JPO does not contract with small business directly**
- **Contracting vehicles are in place for SBIRs and other business at NAVAIR and AFRL**
- **Sustainment opportunity details are still TBD**

Small Business Subcontracts are managed by LMA, NG, BAE, PW, GE and RR NOT the JSF Program Office



JSF Enables True Joint/Coalition Operations





JSF SBIRs To Date

- **Have primarily supported the JSF system vice increased platform capabilities**
- **Principal investment areas have been**
 - Prognostics and Health Management (PHM)
 - Manufacturing and Producibility
 - Environment and materials
 - Thermal Management
 - Propulsion related topics (about 30%)
 - Ceramic Matrix Composites



JSF International Industry Participation





Reduced URF

- **Advanced Castings Technologies**
- **Laser Surface Texturing for Gears and Bearings**
- **Modeling And Simulation Tools for the Melt Infiltration Process to Facilitate Robust CMC Manufacturing Processes and Reduce Development Cycle Time and Cost**
- **Rapid Method for A/C Fastener Surface Preparation**
- **Rapid Prototyping Process for Ceramic Cores for Investment Castings**
- **Direct Part Manufacturing using Selective Laser Sintering (SLS)**
- **Mold In Place Coatings**



Improved Capability

- **Exhaust Jet Noise Reduction for Tactical Aircraft**
- **F-35 Three-Bearing Swivel Nozzle (3BSN) Door Actuator**
- **Innovative Concepts for Stabilization and Control of Aerial Refueling Drogues**
- **F-35 Horizontal Tail Centering Actuator (HTCA)**
- **Binaural Capture and Synthesis of Ambient Soundscapes**
- **High Temperature PM Actuator Motor**
- **Manufacturing of New Active Noise Reduction and Intelligible Communication System for use in Extreme Noise Environments**



Reduced Life Cycle Costs

- **Micromechanical Assessment of Thermochemically Induced NDE Changes in Advanced Composites**
- **Hybrid Bearings Non Destructive Evaluation (NDE)**
- **Residual Stress Measurements Program to Support Condition Based Maintenance (CBM) of Critical Rotating Components**
- **Anti-coking Additive for Ester-based Aerospace Gas Turbine Engine Oils**
- **Intelligent Sensor for Distributed Engine Control Workload**
- **Starter / Generator Efficiency Enhancement**
- **Wear Resistant Coatings for Aircraft Structures**
- **Modeling and Simulation for the Development of Robust Ceramic Matrix Composite Manufacturing Processes**
- **High Temperature Abrasion Resistant Coating**
- **Innovative Coating Removal Techniques**



F-35 Lightning II Inlet Duct Robotic Drilling Cell "Lessons Learned"

28 November 2007





Topics

- **Introductions**
- **Challenge Description**
- **SBIR Topic AF063C-011 Description**
 - Terminally Guided Robots and Robotic Applications in Confined Spaces
- **Phase I and Phase II Contracting Structure**
- **Lessons Learned**
 - F-35 Program Office
 - Northrop Grumman Corporation
 - Variation Reduction Solutions, Inc.
 - Comau
- **Conclusions and Recommendations**



Terms

- **Sponsor – AFRL ManTech**
- **Program User - F-35 Program Office**
- **End User – Northrop Grumman Corporation**
 - User of the developed system in production line
- **SBIR Prime – Variation Reduction Solutions, Inc.**
 - Small business that holds the contract with the AFRL
- **Integrator – Comau**
 - Company that combines technology into a single commercially available product
 - Could be a small business



The JSF Challenge



Bob Heyer

**F-35 Airframe & Manufacturing IPT
Wyle**



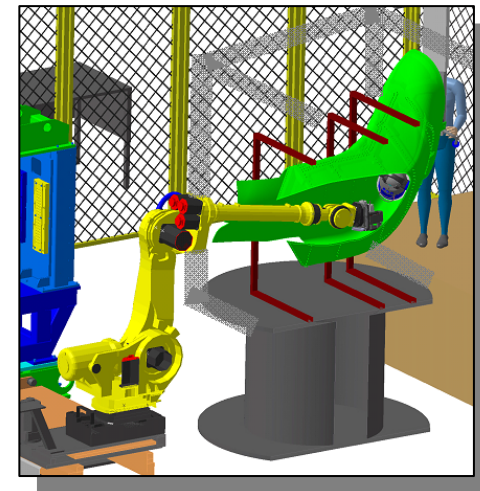
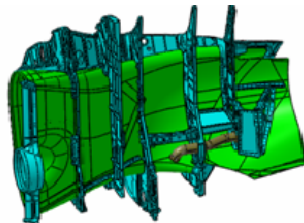
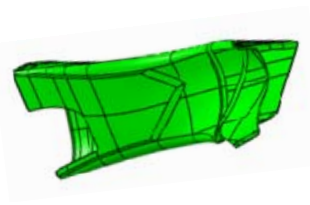
The JSF Challenge

- **THE CHALLENGE**

- Approximately 2,400 Holes per F-35 Inlet Duct Set attaching Aluminum frames to Graphite Epoxy Duct
- Ergonomically Difficult to Drill Manually Inside the F-35 Inlet Ducts
 - Opening is as large as a single technician
- Production Rate Requires Numerous Manual Stations

- **THE NEED**

- Decreased Span time / Increase Throughput
- Reduced URF & Total Ownership Costs
- Reduced Floor Space



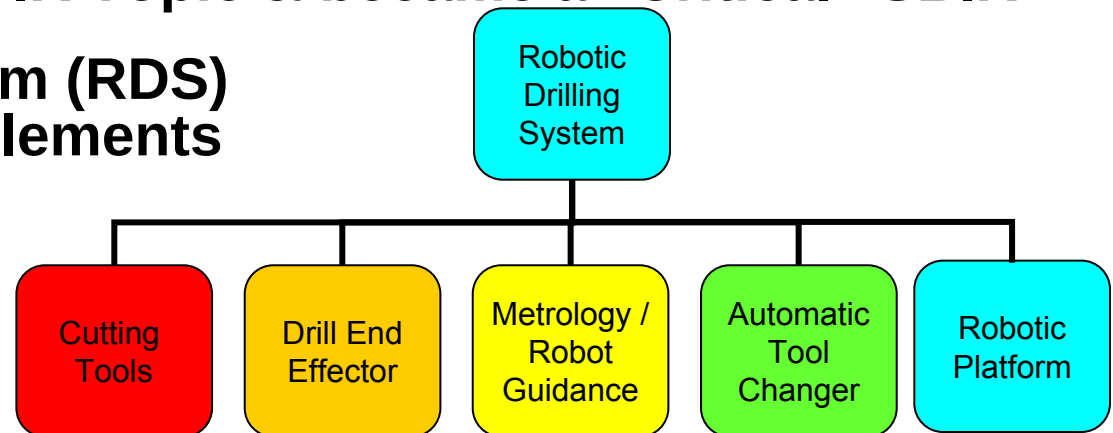


SBIR Topic AF063C-011 Description

- Program Conceived in Spring 2006
- Started as “Broad” SBIR Topic & became a “Critical” SBIR

- **Robotic Drilling System (RDS)
Contains Five Major Elements**

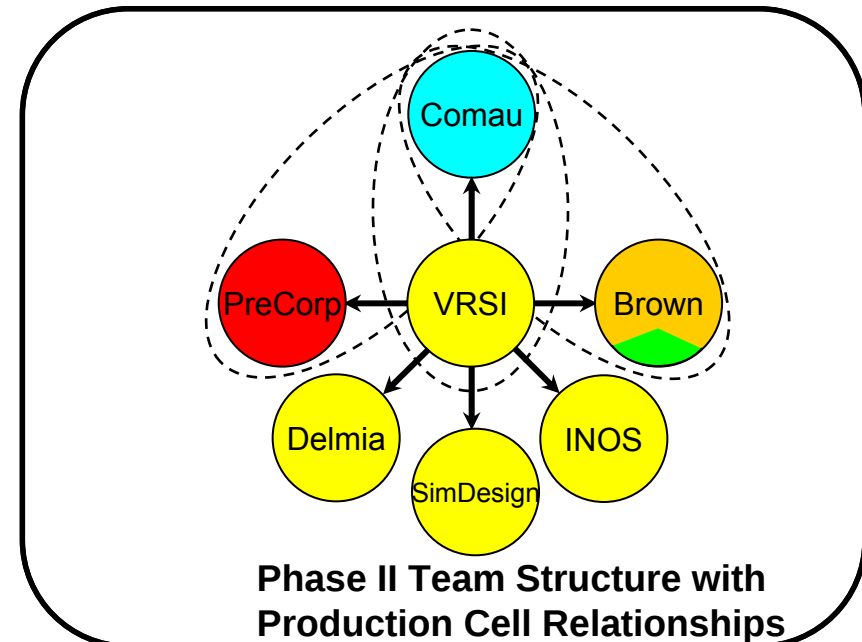
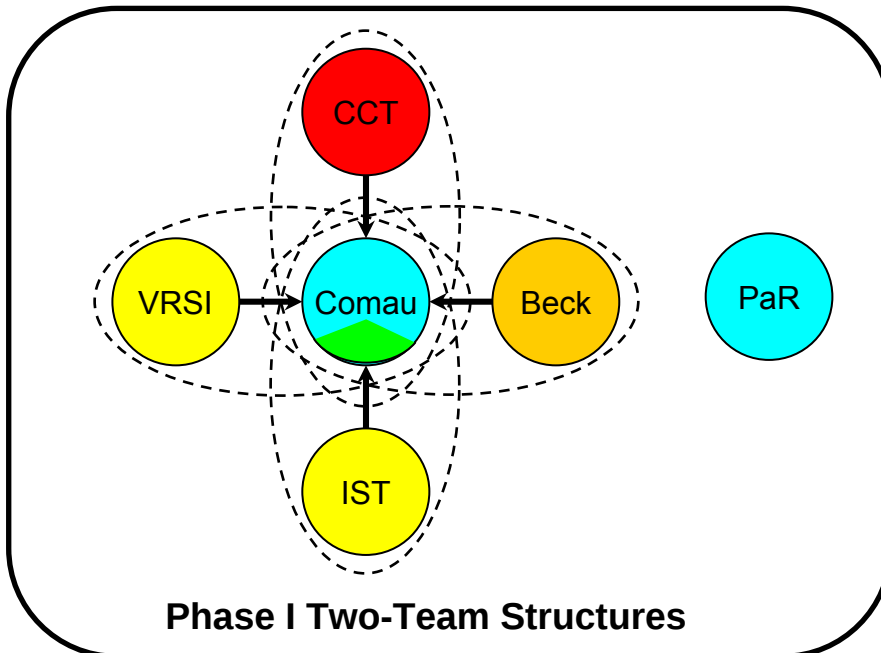
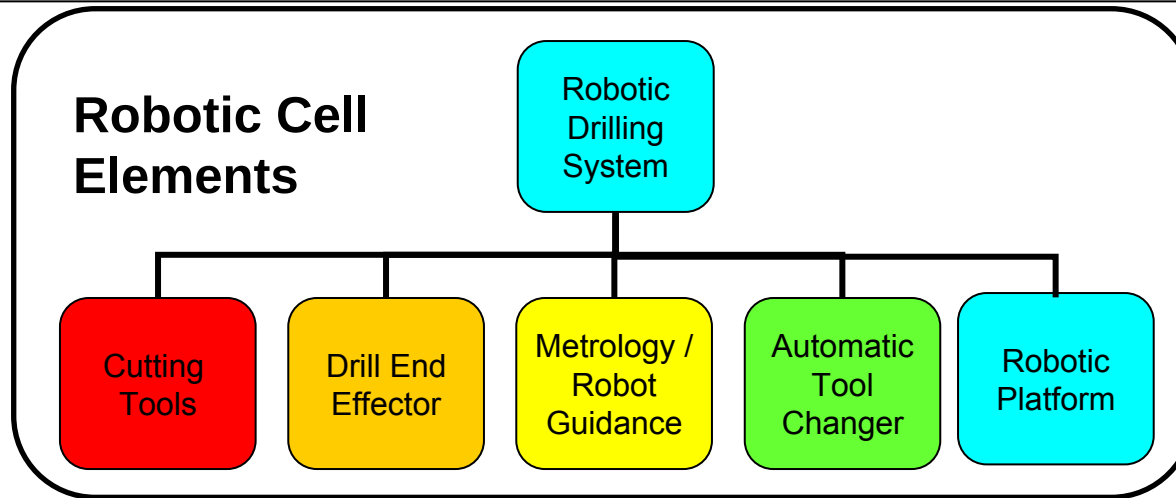
- Robotic Platform
- Drill End-Effector
- Metrology System
- Cutting Tools
- Automatic Tool Changer



- Emphasis on teaming for integrated product
- Phase I: Component development intended for a full system
- Phase II: Develop the system and conduct a baseline capability demonstration
- Phase III: Production floor qualification & certification (Post SBIR)



AF063C-011 Phase I & II Broad SBIR Contracting Structure





Lessons Learned “F-35 Program Office”



Bob Heyer
F-35 Airframe & Manufacturing IPT
Wyle



Lessons Learned

JSF Program Commitments

- **MULTI-LEVEL SBIRs for “integrated products” MUST have**
 - *Well defined overall plan & schedule for incorporation*
 - *Detailed SBIR elements & how they fit*
 - *Detailed milestones with success criteria*
- **THE PROGRAM OFFICE & END ITEM USER must be integrally involved in:**
 - *Defining the SBIR elements & total integration*
 - *Defining the success criteria and testing required*
 - *Providing technical opinions to generic questions during SBIR proposal review process*
 - *Actively participate in the SBIR element meetings & reviews including their personnel who will use the end product*
 - *Commit to incorporating & funding the product if successful*
- **THE END ITEM USER must**
 - *Involve management as well as the ultimate floor user in the process & reviews*
 - *Conduct Pre-Proposal Kickoff Meetings at the User's facility as necessary to understand the project & environment*



Lessons Learned JSF Program Thoughts

- **TEAMING MUST MAKE “GOOD BUSINESS SENSE”**
 - *Teaming too early can create awkward arrangements later*
 - *Teaming too late, you can miss the boat*
 - *Teaming on the “right team” to fit your expertise and product to the integrated product is a must to mutual success*
- **TEAMING IS SOMETIMES NECESSARY TO BID PHASE II but the challenges are:**
 - *Defining the Team Lead that makes good business sense*
 - *Developing, defining and marketing to the participating Small Businesses a “business plan” that makes sense – team or buy that item off the shelf*



Lessons Learned “End User”



Scott Gillette

**Engineer - Manufacturing Technology Development
Northrop Grumman Corporation**



Lessons Learned

NGC End User

- **Project Definition**

- End-User must work with AFRL to define the project solicitation documents, project phases, timetable, system requirements, testing milestones (MRL)
- Clear definition by End-User of development vs. scale-up to better focus the SBIR funding (system WBS)
- End-User should host an “Information Session” prior to Phase I proposals deadline
- End-User should host a “Kick-Off meeting” for discussion and re-iteration of project goals/vision
- Additional Milestones should be added between the BAA and the proposal deadline





Lessons Learned

NGC End User

- **Small Business Participation**
 - Understand the small business capabilities for supporting the final product prior to entering into a Phase I contract
 - Assess the business readiness level of the participating teams and small businesses
 - Competent suppliers chose not to bid due to the requirements for SBIR documentation
 - Many professional SBIR companies focused more on self-sustenance instead of product delivery
 - Many of the SBIR companies have an R&D culture versus a product delivery culture
 - SBIR Phase I Proposals should include a test plan to demonstrate a MRL 3 or 4



Lessons Learned

NGC End User

- **Non Small Business Participation**
 - End-User
 - Should be involved in project definition, monitoring and reviews
 - Should provide a comprehensive requirements document
 - Should provide selection criteria for the SBIR proposal review process
 - Should define the success criteria and required testing
 - Must commit to funding end product for implementation if successful
 - Participation by end-user in Phase II is recommended
 - Integrators (could be a small business)
 - Must provide systems integration support
 - Maintain the high-level “vision” with the end-user and aid in flowing down the requirements to the small businesses or subcontracts
 - Integrator(s) and their involvement should be identified with the Phase I proposal
 - Program Offices



Lessons Learned

NGC End User

- **Competition**
 - Multiple Phase I contracts will yield options for Phase II
 - Down select to one integrator for Phase II that uses the best of all the Phase I SBIR participants
 - Component level technology should have adequate competition during Phase I
- **Teaming**
 - Avoid formal teaming agreements that bind companies together even if they do not achieve Phase I goals
 - Teams with no End-user or no system integrator participation should be considered very risky
 - Must be able to choose from the best technologies/companies from Phase I in order to create a high-performance team for Phase II



Lessons Learned

NGC End User

- **Intellectual Property Protection**
 - Small Businesses are very protective of intellectual property
 - Allow time for establishment of PIA/NDA during project solicitation and Phase I proposal submission
 - Establish agreements with End-User and amongst small businesses and integrators
 - Small businesses must coordinate business plans for the technology with the End-User



Lessons Learned “Small Business Phase II Prime Contractor”



Brett Bordyn
Variation Reduction Solutions, Inc.
Project Manager



Phase I Key Events

VRSI – SBIR PRIME

- **PRE-SOLICITATION INFO SESSION**
 - Provided a personal tour of the problem statement by NGC
 - Fostered communications between attendees and
 - Created a foundation for further discussions and agreements
- **PHASE I MULTI-PARTY NON-DISCLOSURE AGREEMENT**
 - Signed just after kick-off meeting at NGC Palmdale by Beck Engineering, IST, VRSI, CCT, and Comau.
 - Allowed the four small businesses connected to the Comau “hub” to jump-start the coordination of their Phase I development efforts.
 - Protected exchange of technical data
 - Did not protect against competition
- **PHASE I COLLABORATION AGREEMENT**
 - Started in the beginning of Phase I by Beck Engineering, IST, CCT, VRSI, and Comau.
 - Deemed valuable at the time in order to strengthen the Team’s chances of being awarded Phase II.



Lessons Learned

VRSI – SBIR PRIME

- **Phase I Collaboration Effort Failed**
 - **Agreement was signed too early in the research process.**
 - Partners' Phase I technical progress and success not yet known
 - Not all partners' Phase I research efforts were ultimately deemed necessary for the Phase II project.
 - **Unanimous consent was required to dissolve the agreement**
 - Partners with 'vulnerable' technologies were reluctant to sign off.
 - Partners' sense of entitlement to R&D funds made it impossible to reach an acceptable budget for Phase II.
 - Guarantee of inclusion in teamed proposal resulted in a budgetary impasse.



Lessons Learned

VRSI – SBIR PRIME

- **PHASE I Collaboration Effort Failed (cont'd)**
 - **Accelerated Phase I schedule contributed to failure**
 - Phase II Proposal was due two weeks after Phase I Interim Reports.
 - Some partners continued research efforts past Phase I deadline – creating a constantly-changing technical landscape.
 - **Fallout from Collaboration Agreement dissolution caused further delays**
 - Phase II Proposal Deadline was extended an extra month to June 25, 2007 in order to allow Phase II Bid Invitees to form new partnerships.



Lessons Learned

VRSI – SBIR PRIME

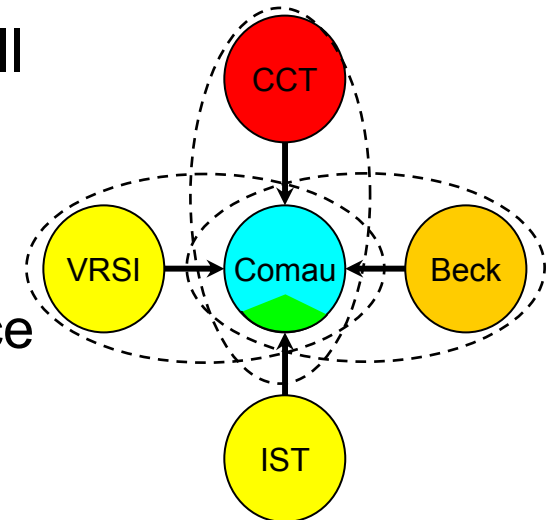
- **Participation of End-User (NGC) was extremely valuable / necessary to project success**
 - Provided an efficient flow of information concerning the process and environment of the intended production RDS cell.
 - Kept all small businesses technically 'on-track' - focused on achieving a final, integrated product.



Lessons Learned

VRSI – SBIR PRIME

- **‘Comau Hub’ was a great advantage**
 - Comau Proposal Department assisted small businesses in Phases I and II
 - Experienced integrator comfortable with bidding larger projects
 - Comau able to provide ‘big picture’ relevance in proposals
 - Comau was subcontracted for project management
 - Technical efforts of 4 small businesses were combined into a concise weekly report with a consistent format
 - Single point of contact for open issues
 - Comau’s shop facilities and equipment were used for Phase I preliminary testing





Lessons Learned

VRSI – SBIR PRIME

- **After Collaboration Agreement restrictions were eliminated, the team refocused to a business approach to maintain technical excellence with a maximized product value**
 - Eliminated elements that required unnecessary development
 - Commercially available elements were incorporated in the manufacturing solution
 - Enhancing elements were scrubbed and proposed as “options” to the proposal
 - Team / contract organization was streamlined to maximize team performance and financial utilization



SBIR Phase II Team Technical Roles

Metrology and Robot

Control



- develop metrology and controls for RDS
- testing for MRL5 – MRL7
- develop/refine all Inlet Duct RDS processes for production



- mathematics for coordinate system calculation and transformation
- core software interface



- robot access studies: OLP and collision avoidance
- RDS simulation
- optimization of metrology target positions (cell, workpiece, EOAT)



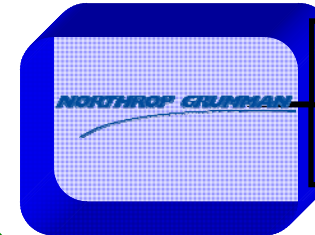
- robot-mounted, multi-line laser sensor to gauge c'sink position and depth
- customization of fixed mounted, sensor to verify proper cutter change out

RDS Cell Integration



- design/fabrication/integration of RDS at Comau facility
- robot programming and testing support
- team technical reporting and project tracking

Validation



- fabrication of test coupons and LH Inlet Duct for drill studies
- MRL testing criteria and testing oversight
- technical guidance to keep the team focused on final product

Drill Head and Cutters



- customization of compact, servo-driven drill head, tool changer, and drill controls



- low-thrust, one-shot drill/c'sink cutter optimization and testing for CFRP/Al



Lessons Learned

VRSI – SBIR PRIME

LEGAL ARRANGEMENTS CAN SIMPLIFY OR HARM THE FINAL SOLUTION

PHASE I - SBIR

- Restrictive Collaboration Agreement stifled team success and final product

PHASE II - SBIR

- Multi-party NDA signed instead of a Collaboration Agreement
- Contract vehicles have been finalized between VRSI and all subs
- Technology developed during Phase II were “explicitly” given to each company for **their** benefit and marketing

PHASE III – Final Product Procurement

- Commercialization Agreements are in Process during Phase II as final solution of the end product not defined yet
- Expect to begin negotiations with the end user for terms of



Lessons Learned - Conclusions

VRSI – SBIR PRIME

- **Focus on “the Business Solution” may involve teaming**
 - BUT AVOID restrictive agreements that lock in team members without clauses for performance or relevance
- **Carefully scrutinize which project outcomes require technology maturation and/or can be met with commercial products.**
- **Ensure technology development is mature enough so that overall project integration can meet realistic cost, schedule & performance expectations for the business solution**
- **Don’t rush Phase I – allow time to evaluate results before submitting Phase II proposals**
 - Want to allow the customer time to evaluate Phase I performance
 - Participants need time to develop an acceptable Phase II business plan and proposal



Lessons Learned “Robotic Drill Cell Integrator”



Joe O'Brien
Comau Project Manager



Lessons Learned

Comau – Integrator

- **THINGS TO CONSIDER - Prior to Posting SBIR**
 - **“Don’t Reach too Far”**
 - Understand that Phase 1 is essentially a feasibility study and does not build or test any physical devices
 - If the technology has not been tested to validate viability before Phase 1, it may represent too much risk to the Phase 2 efforts
 - Basic performance testing of key characteristics must be established as the basis for a sound project plan
 - Technology must be:
 - A logical adaptation of something in existence - not a first time invention
 - Pre-tested before Phase 1 so the Phase 1 feasibility can deal with the adaptation issues, not the entire invention



Lessons Learned

Comau – Integrator

- **THINGS TO CONSIDER - Prior to Posting SBIR (cont'd)**
 - **FACILITATE AN ENVIRONMENT** that fosters businesses to develop a “business model” to the end solution
 - The focus of individual elements should not eclipse the goal of a final integrated solution
 - A single integrated solution begins in Phase I
 - **UTILIZING INDIVIDUAL ELEMENT PROPOSALS may NOT equate to a final integrated business solution**
 - If the Phase 1 bid is for individual technologies, it requires that the SOW recognize the end product integrated solution and that some areas may not need development.
 - The end user needs to focus on the end product in the SOW in order to create the performance requirement but not dictate the elements to allow creativity for the final product.
 - If the focus of Phase I is on the elements and not the end solution, then Phase 2 will have difficulty integrating to the final solution.



Lessons Learned

Comau – Integrator

- **THINGS TO CONSIDER - At time of Posting SBIR**
 - **ALLOW ADEQUATE TIME** for technology assessments, NDA's, and other legal partnering agreements prior to the proposal stage
 - **ENCOURAGE THE BUSINESS SOLUTION** and let the partnerships develop as appropriate
 - The purpose of the SBIR is to find a manufacturing solution, not to foster collaboration for collaboration's sake
 - Specify the “requirements” and NOT the “solution”
 - Have a “Bidder's Conference” to support interaction among the bidders but:
 - If the bidder has all the resources available for a unilateral bid they may not want to partner
 - If the bidder does not have the resources available for a “Full Solution” it will be reflected in the quality of the proposal
 - The partnerships that are formed should be based on the business solution required for Phase 2



Conclusions and Recommendations



Lou Concha



Conclusions

- Critical Manufacturing SBIRs require larger amounts of planning and involvement by the Program User and the End-User
- The “business solution” dictates the value of Intellectual Property and the pricing of the end product
- Critical SBIRs require a higher starting MRL/TRL for all critical elements
- Understanding the team members and their contributions and working strengths / constraints is important to program success
- End-User, Program User and System Integrator involvement must work diligently to maintain the “final product focus”

***Focus and Collaboration are Significant
Ingredients to Critical SBIRs***



Recommendations for Future Critical SBIRs

- 1. AFRL, Program Office and the End-User Must work Together to Provide a Structured Project Plan and Ensure the Project Goals are Clear and Executed**
- 2. Time Table Should Allow for Project Goal Conveyance, Protection of Intellectual Property, Establishment of Teams and Evaluation of Small Business Capabilities (60 days from BAA) while Expediting Contractual Process**
- 3. Teaming Agreements Should be Monitored and Agreed with by the End-User, AFRL and Program Office**
- 4. Phase I Funding Should Allow for Component-Level Competition to Ensure Adequate Options for the Phase II Effort and Achieve MRL 4**
- 5. Participation of the End-User is Mandatory in All SBIR phases from conception to end product procurement and use**



JSF Future

- JSF expects to continue using the Integrated SBIR approach to enhance our Affordability
- SBIR clusters / priority topics will be forthcoming in future SBIR solicitations



***WORKING TO AFFORDABLY MEET THE
REQUIREMENTS OF THE WARFIGHTER***

QUESTIONS



F-35 LIGHTNING II PROGRAM TEAM

The Inlet-Duct SBIR Program and Manufacturing SBIRs

28 Nov 2007



**Manufacturing Technology Division
Air Force Research Laboratory**

Luis Concha

ManTech SBIR Program Manager

937/904-4325

Luis.concha@wpafb.af.mil



AF Manufacturing SBIRs



AF “Manufacturing SBIRS” are new type of SBIR

Presidential Executive Order Encouraging Innovation in Manufacturing – February, 24, 2004

- “Section 1. Policy. Continued technological innovation is critical to a strong manufacturing sector ... Federal Government has an important role, including through the Small Business Innovation Research (SBIR), in helping to advance innovation, including innovation in manufacturing, through small businesses.”
- “(a) give high priority within such programs to manufacturing-related research and development to advance the policy set forth in section 1 of this order”
- “(d) “manufacturing-related” means relating to: (i) manufacturing processes, equipment and systems; or (ii) manufacturing workforce skills and protection.”

Center Feedback



Manufacturing SBIR Program



Goal – Harness the innovation of small companies to drive the “technologies” our Warfighters need from prototypes to the factory floor

Approach – Create new manufacturing processes that rapidly transition the “lab set-up” to the production line

Key Tenets

Focused on customers (PEO, ALC, etc.) priority requirements

Close ties to wing and prime customers – implementation “partners”

Urgency of opportunity – window for impact ≤ 3 years

Starting point “mature” technologies – TRL 6 and MRL 3+ to 4

Business viability required for manufacturing process investment



Manufacturing SBIR Topic Development Process



Define Problem Area(s)

- Initial Prime/Sub Manufacturing Readiness Assessment (MRA)
 - Established baseline of OEM/Vendor manufacturing process for improvement
- Value Stream Analysis - Identify problem areas with highest impact
 - Pareto analysis of critical manufacturing process issues/needs
 - Established future state for manufacturing process
 - Established goals, thresholds for project (mfg SBIR)

Value proposition

- Quantify technical, cost, and schedule ROIs or



Manufacturing SBIR Topic Development Process

Feasibility

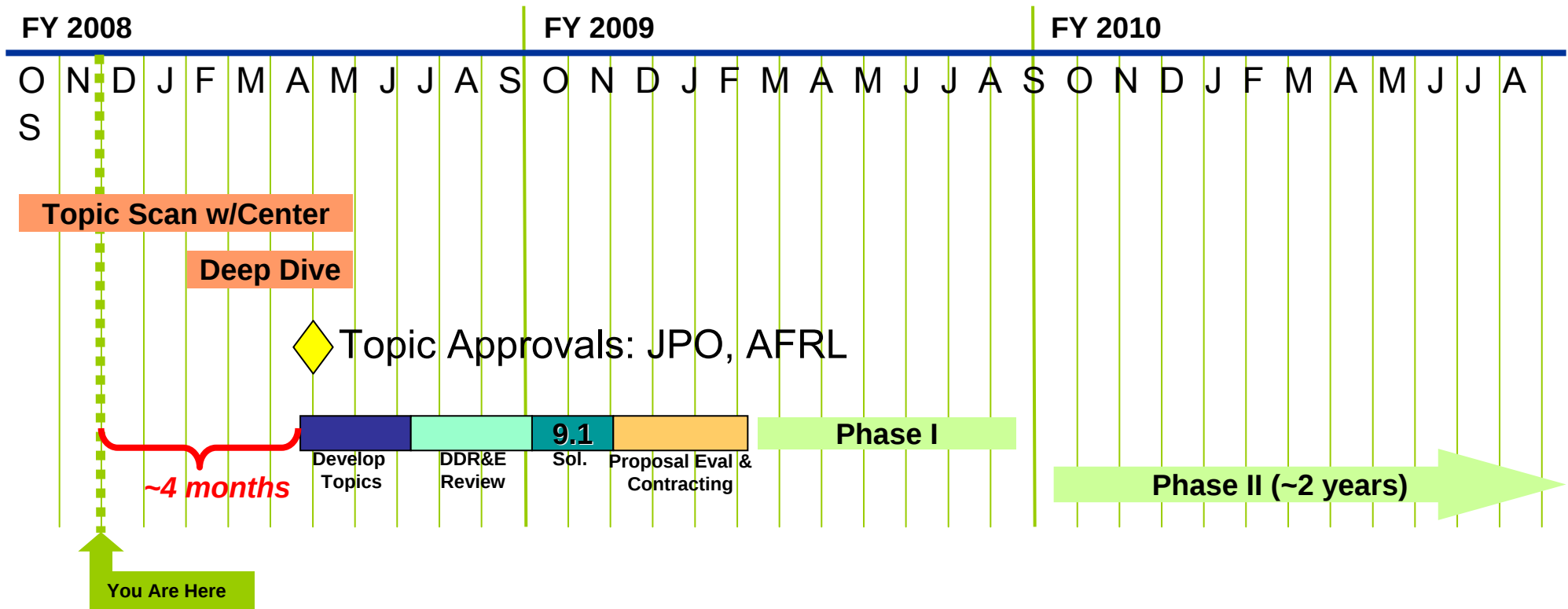
- Project cost & schedule defined and within Mfg SBIR constraints
- First draft - Technology Transition Plan
 - Agreed to project completion date/event
 - Established follow on requirements, schedule, and costs to complete implementation
 - Qualification, certification, LRIP, first articles, rtc/
- Industrial Base Assessment (IBA)
 - Identified potential technologies
 - Establish the risks of the technologies
 - Identified potential small businesses
 - “Small” business scope
 - Define the risks of identified sources

Solicitation

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AF SBIR - Approximate 2009 Cycle Planning Dates





AF SBIR Topic Types



Solicitations prior to FY2007.3

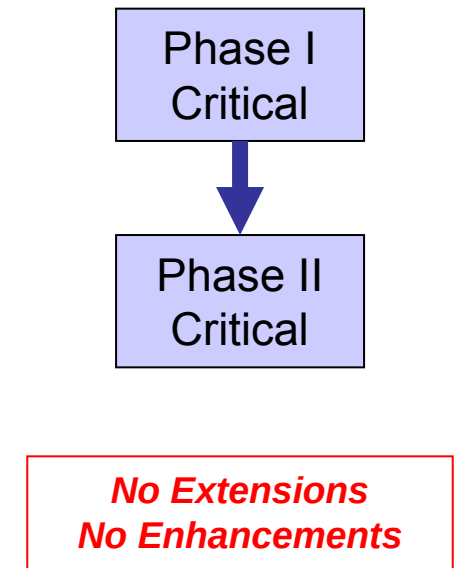
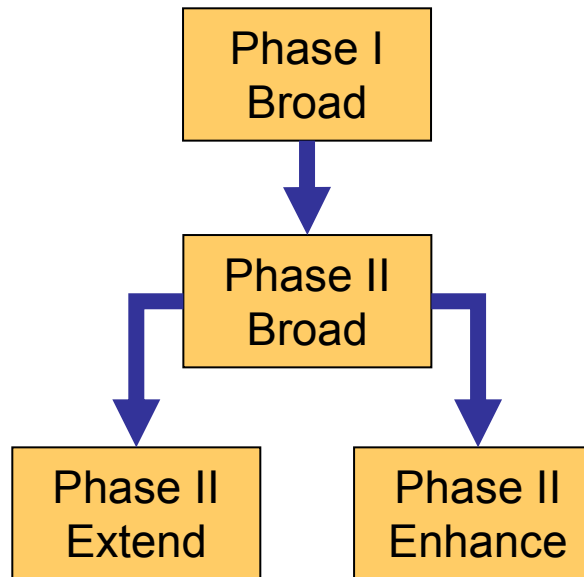
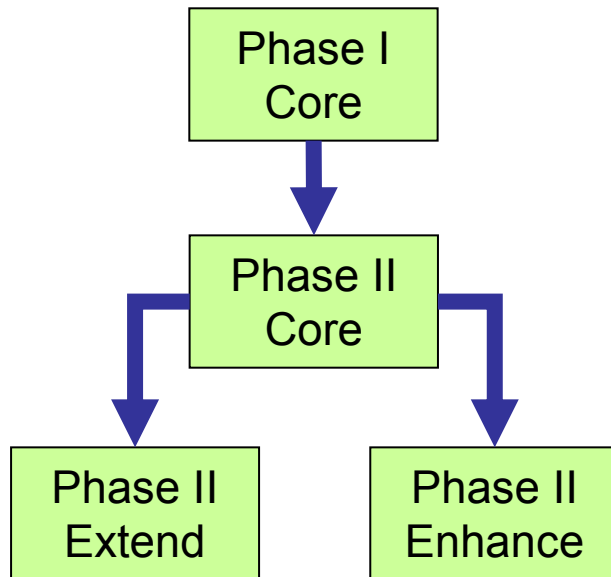
- All topics were “regular”
 - Two phase I awards per topic
 - At least 1 phase II award per topic

Current Solicitations

- “Core”
 - Just like “regular” topics
 - Two phase I awards per topic
 - At least 1 phase II award per topic
- “Broad” - equals 4 “core” topics
 - Broad in scope allowing for many phase I awards
 - Multiple phase II awards
- “Critical” - equals 4 “core” topics
 - Regular phase Is
 - Large dollar phase IIs



What can be Extended – Enhanced





Inlet-Duct Drilling Program Panel Session



Inlet Duct Drilling – Hybrid “Traditional” and “Manufacturing” SBIR Program

- SBIR Topic and Solicitation per Traditional SBIR guidelines
- Manufacturing SBIR contents
 - Focused on transition to production environment
 - IPT Program Management: JPO, Prime, ManTech Team
 - Urgency of opportunity
 - Larger dollar value Phase II





Inlet Duct Drilling Program

Key Takeaways



Panel member experiences provide an opportunity to share lessons and recommendations with SBIR community

- Prototype Manufacturing SBIR Program – focused on tech transfer

Program has not completed

- This is a work in progress and we may have more to share next year

Inlet Duct program is a hybrid SBIR containing elements of both traditional AF SBIR and AF Manufacturing SBIR

- Observations for both S&T and Manufacturing SBIRs

Air Force Small Business Programs “Reaching Beyond Goals”



Phil Roth
Program Manager
Air Force Small Business Center of Excellence



Outline



Who is Air Force Small Business?
Outreach Capabilities
Contributions to Air Force Priorities
Technology Programs
Performance
Beyond Goals – Challenges and
Way Ahead

Not just about dollars and percents!





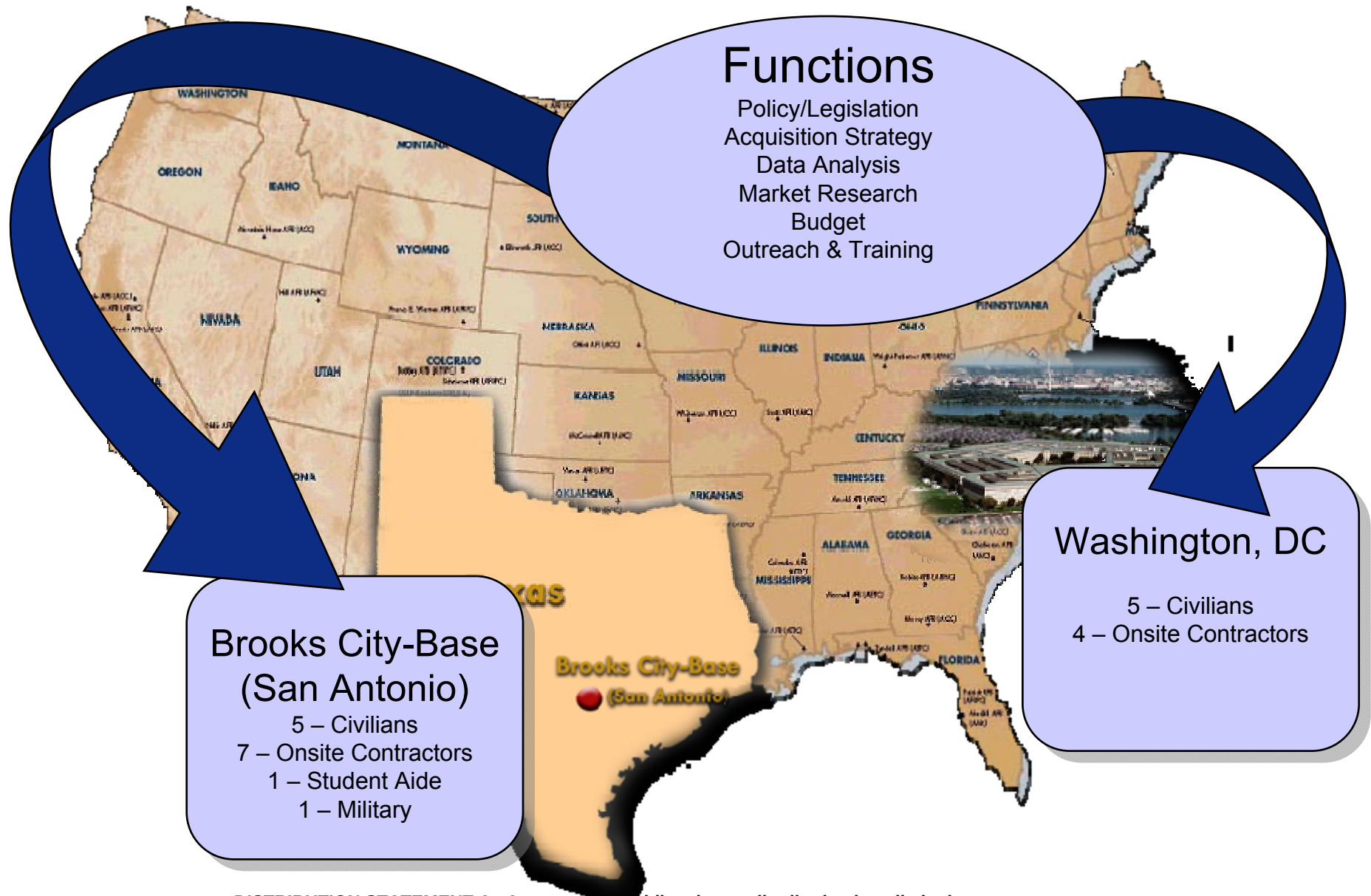
Our Mission

- Advocate for small business solutions
- Promote effective outreach
- Ensure fair opportunities in procurements
- Work to maintain a strong defense industrial base
- Execute annual budget of approximately \$12M

Win GWOT, Care for Airmen, Modernize/Recapitalize



AF Office of SB Programs





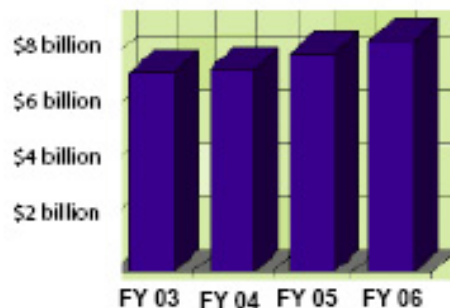
Small Business Snapshot

Who We Are

145 Small Business Professionals at locations nationwide. For the Small Business specialist nearest you, go to www.selltoairforce.org

Air Force Small Business Contract Dollars

FY 03 \$7.5 billion
FY 04 \$7.6 billion
FY 05 \$8.2 billion
FY 06 \$8.7 billion



Major Programs

- ♦ Small Business
- ♦ Small Disadvantaged Business
- ♦ 8(a) Business Development
- ♦ Veteran-Owned Small Business
- ♦ Women-Owned Small Business
- ♦ Native American
- ♦ Mentor-Protégé
- ♦ HUBZone
- ♦ Historically Black Colleges and Universities
- ♦ SBIR/STTR
- ♦ MTAPP
- ♦ Mentor-Protégé

Contact Us

www.selltoairforce.org
Air Force Outreach Program Office
Air Force Small Business Center of Excellence
3315 Sidney-Brooks
Brooks City-Base, Texas

KEY LEADERS

Air Force Office of Small Business Programs
Director
Ronald A. Poussard

Air Force Outreach Program Office
Air Force Small Business Center of Excellence
Director
Renee Wesley-Case

Factoids

- Small business represents 99.7% of all employer firms
- Small business accounts for more than 50% of non-farm GNP
- Small business makes up 2/3 of new jobs created in last 10 years
- 55% of workers employed by firms with less than 100 people



SB Outreach Tools



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- SB Learning Ctr
- Calendar
- General
- Locator
- Procurement Forecast (LRAE)
- News
- Opportunities
- Outreach Pgm Ofc
- Programs
- Training
- User's Guide



Air Force names Ronald A. Poussard new Director of Small Business Programs

Selected for reassignment as Director, Office of Small Business Programs, Office of the Secretary of the Air Force, Washington, D.C.

ARTICLE 1 of 7

PREVIOUS

PAUSE

NEXT

READ MORE

More Hot Items

- [2007 Air Force Small Business Education and Training Conference - Destin, FL](#)
- [Concept Papers Sought for Air Mobility Battlelab](#)
- [Regulatory Updates](#)
- [Mentor Protégé \(M-P\) Program FY07 Broad Agency Announcement \(BAA\) FA8901-07-R-0001](#)
- [Air Force FY 01-05 Achievements](#)
- [Readership Survey](#)

Small Business & Minority Institutions



[Small Business Learning Center Modules](#)

- [How do I get started?](#)

Government Entities



[Small Business Pocket Guide](#)

- [Continued Suspension of the Price Evaluation Adjustment for Small Disadvantaged Businesses](#)

U.S. Air Force Small Business Newsletter



Air Force Small Business Snapshot



Address: http://www.selltoairforce.org/sell2af_sbhc



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Master List

--- Select One ---

Small Business

--- Select One ---

Acquisition Professional

--- Select One ---

SB Manufacturing

--- Select One ---

Small Business Tips

Did you know....
FAR Part 26 covers the
HBCU/MI Program

Small Business Note

Course completion
certificates are
available to registered
students only.

[Learn More](#)

Small Business Learning Center Course Tracks

Welcome to the Small Business Learning Center

This site was designed specifically for Acquisition Professionals to increase their own knowledge, to instruct other Acquisition Professionals, and to train small businesses. Additionally, small businesses can use this site to train themselves.

To guide your training there are four (4) Course Tracks above: Master List, Small Business, Acquisition Professional, and SB Manufacturing. If you are unsure of which track to follow, select a track and read its description. Then, choose a tutorial from the drop down menu. The newest tutorials are displayed toward the top of this menu.

Registered students, please log in.

Newest Tutorials

- Mentor Protégé

[Return to Introduction](#)



Small Business Learning Center

Current Curriculum:

How to Sell to Air Force
Bundling & Consolidation
HUBZone Program
Contingency Planning
Lean Manufacturing
Source Selection
Indian Incentive
Acquisition Forms
DCAA & the Acq Professional
Measurement Instruments

Market Research
Government Ethics
SB Primer (Contracting 101)
Shop Math
Project Management
Small Business Utilization
Contractor Payment Info
Reading Blueprints
Source Approval Requirements
Contractor Registration



http://www.selltoairforce.org/sell2af_sbhc

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Supporting USAF Priorities

- **“Winning the Global War on Terrorism”**
- **“Developing and caring for our Airmen and their families”**
- **“Modernizing and Recapitalizing our aging aircraft, spacecraft, and equipment”**



Air Force Small Business

Programs to Deliver Technology to the Warfighter



Manufacturing Technical Assistance Production Program

Assist in increasing and enhancing the competitiveness of small manufacturing firms in support of the Air Force, Department of Defense and their major prime contractors

Build supply chain knowledge base and rapidly identify critical DoD supply chain issues with highest SB success probability

Apply innovative and practical supplier development methods and execution frameworks to address capability gaps



Select and/or develop small business manufacturer member base with capability to address needs

Position members to apply value to the DoD by championing MTAPP within the DoD supply base

Network MTAPP stakeholders to build sustainable DoD supply chain support



Mentor-Protégé Program

Assists small businesses (Protégés) to successfully compete for contract awards by partnering with large companies (Mentors) under individual agreements.

Benefits to the Mentor

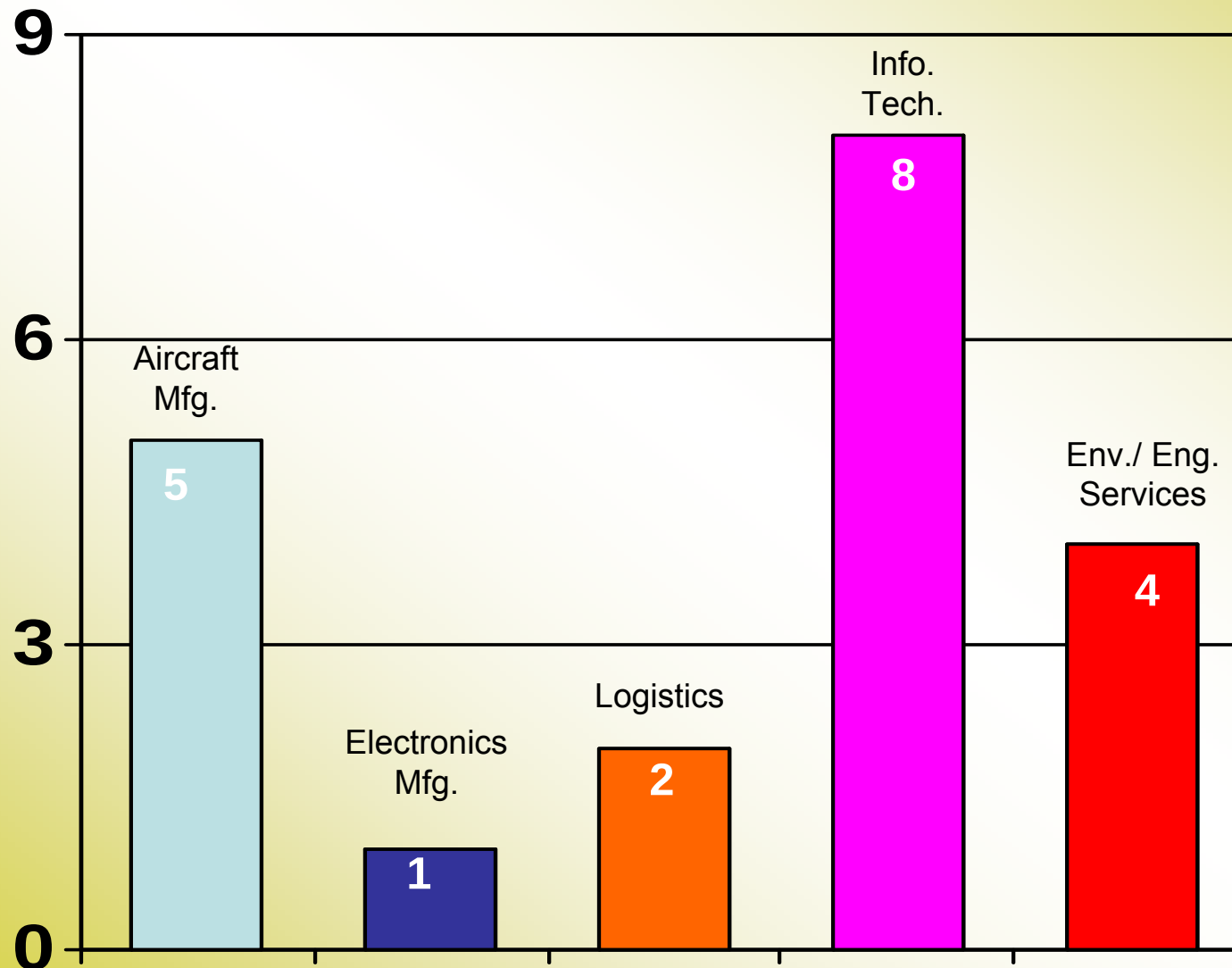
- ◆ Develop long term business relationship with qualified small businesses
- ◆ Develop an effective and high quality pool of eligible small businesses
- ◆ Enhance technical capabilities of both firms
- ◆ Pursue new market opportunities as MP team
- ◆ Issue subcontracts to protégé on a noncompetitive basis
- ◆ Gain a source selection/past performance evaluation factor
- ◆ Receive cost reimbursement

Benefits to the Protégé

- ◆ Technology transfer
- ◆ Engineering and technical training production, ISO, and quality assurance
- ◆ Business infrastructure enhancement
- ◆ Develop long term business relationship with Prime Contractor
- ◆ Expands subcontracting opportunities
- ◆ Business development and planning
- ◆ Protégé may leverage technical expertise of mentor to bid on SB set-aside contracts
- ◆ Improve competitive advantage



20 Current Agreements Protégé





Mentor-Protégé Technology Thrust

Focus on innovative “state of the art” technology

Robotics

Anti-Corrosives

Power Sources

Bio-Medical Engineering

Chemical/Biological Defense

Aerospace Products & Parts Manufacturing

Aerospace Support Equipment

Military Aircraft/Missiles – Manufacturing, Repair, Overhaul (MRO)

Navigational, Measuring, Electro-medical, control instruments



Mentor-Protégé Program Tutorial



The Air Force implementation of DoD's Mentor-Protégé Program is unique, yet fully explained in this tutorial. Entry into the reimbursement program is through separate contracts awarded for mentoring efforts—find out how that process works.





Small Business Is Key

Program Awareness!

AF Senior Leadership recognizes importance of small business utilization

Small Business programs and initiatives continue to increase contracts to (HUBZone, 8(a) Woman Owned Business and Service Disabled Veterans)

Special Programs Participation

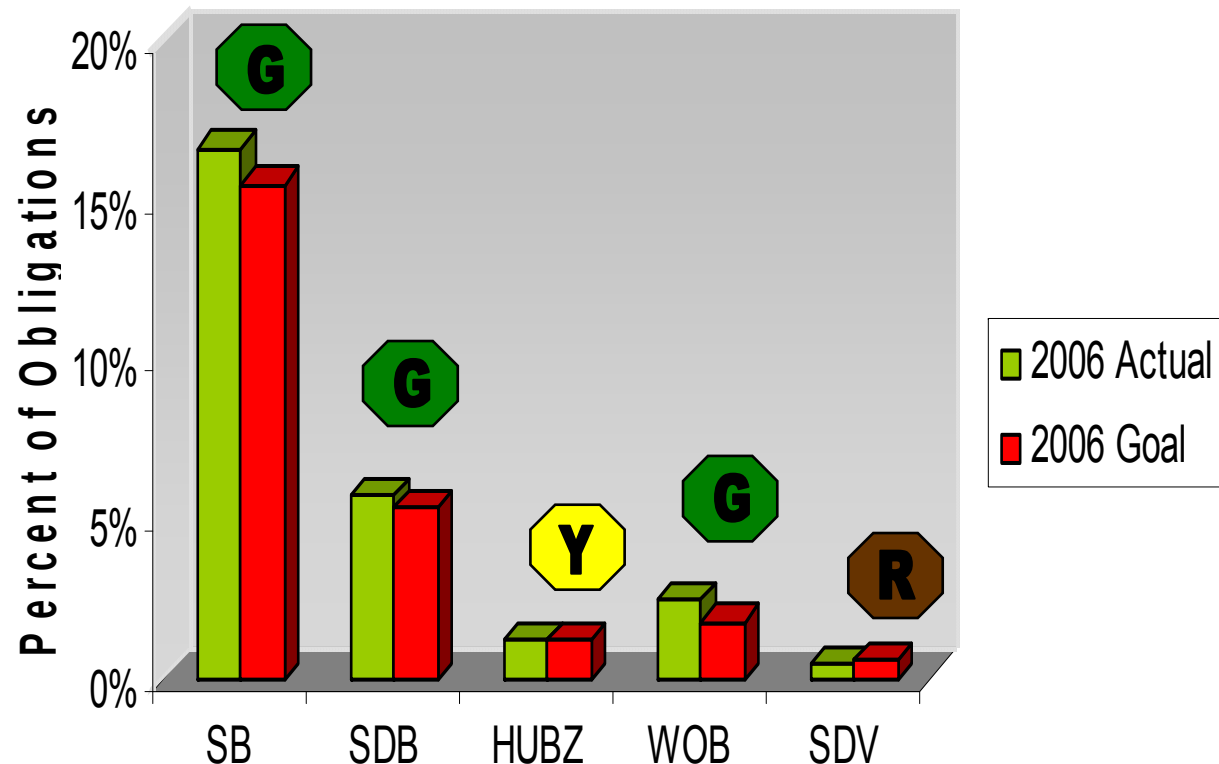
MTAPP

Mentor/Protégé



FY06 Performance Summary

Air Force Results: Actuals vs. Goals



Data Source: J001 EA1 for FY02-06

SB - \$8.7B

SDB - \$3B

HUBZ - \$636M

WOSB - \$1B

SDV - \$239.5M

HBCU/MI - 81.8M



Air Force Small Business

Beyond Goals



Challenges

- Integrating SB technology programs
 - **SBIR, Mentor-Protégé, MTAPP**
- Pushing Commander visibility/support
- Increasing prime contracts to SB
- Reversing customer perceptions of SB risk
- Raising limits on SBIR Phase II (\$750K → \$3-5m?)
- Ensuring data availability and accuracy
- Strengthening SB as part of “regionalization”
- Expanding Service-Disabled SB opportunities
- Collecting/reporting mission contributions



Reaching Beyond Goals

➤ **Focus on results**

- ✓ Initiate program results process
- ✓ Capture and report SB contributions to mission
- ✓ Recognize successes and challenges

➤ **Link SBIR and other SB technology programs**

- ✓ Identify SB opportunities – R&D to manufacture
- ✓ Create SAF/SB, AQR and AFRL partnership
- ✓ Tie MTAPP to Air Force and joint priorities

➤ **Initiate aggressive Service-Disabled Veteran program**

- ✓ Outreach
- ✓ Incentives (M-P, MTAPP, Joint-Ventures)



Questions?



Contact

SAF/SB – (703) 696-1103

AFOPO - (210) 536-1317

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Air Force Small Business

Air Force Outreach Capability Leads DOD



Mission: Outreach

Multimedia (“Getting the word out”)

- Using multimedia to increase communication within the acquisition and small businesses communities
- Producing T.V. programs and radio spots targeted to small business concerns



www.pentagonchannel.mil

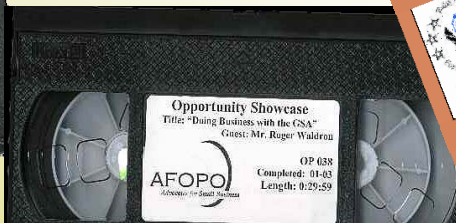
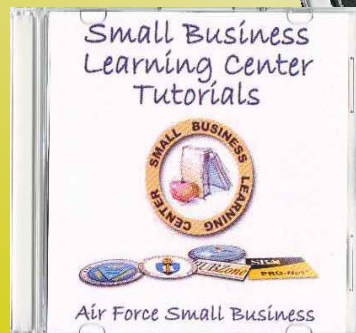
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Mission: Outreach

Education and Training

- ✓ Provides training to acquisition personnel and small businesses
- ✓ Leading joint agency (SAF/AQC,SBA,VA) training teams
- ✓ Support nationwide outreach events with training seminars
- ✓ Provides web-based training



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Air Force Small Business

Small Business - Critical to Air Force Priorities



Supporting USAF Priorities

➤ “Winning the Global War on Terrorism”

Custom radio frequency filter devices for critical aerospace systems and manufactured electronics products used to deter IED's in Iraq:

KW Microwave developed devices under a Mentor-Protégé partnership with Northrop Grumman.

Body Armor Plate:

Excera Materials Group developed a body armor plate for flak vests used in Iraq and Afghanistan. Lighter/tougher and withstands more than a half-dozen simultaneous bullet strikes.

Rechargeable lithium battery packs for the Pointer UAV:

Compact Power designed and built in less than 45 days for operations in Iraq and Afghanistan. Estimated savings is 60:1, plus increases productivity.

LAST Armor:

Foster-Miller developed a lightweight ceramic composite armor mounted to a velcro base. For the first time, this protected C-130, C-141 and C-17 aircraft from ground fire on low level missions. Provided aircraft with increased protection without reducing payload capability in combat operations.



Supporting USAF Priorities

- “Developing and caring for our Airmen and their families”
 - **Small Business provides critical services to Airmen and their families at every AFB base in the U.S.**
 - **Medical treatment facilities**
 - ✓ Clinical support (doctors, nurses, med techs)
 - ✓ Non-Clinical support (appointments, referrals, records, billing, etc.)
 - **Security guards at all CONUS bases**
 - **Environmental remediation and clean-up**
 - **Military Family Housing Construction**

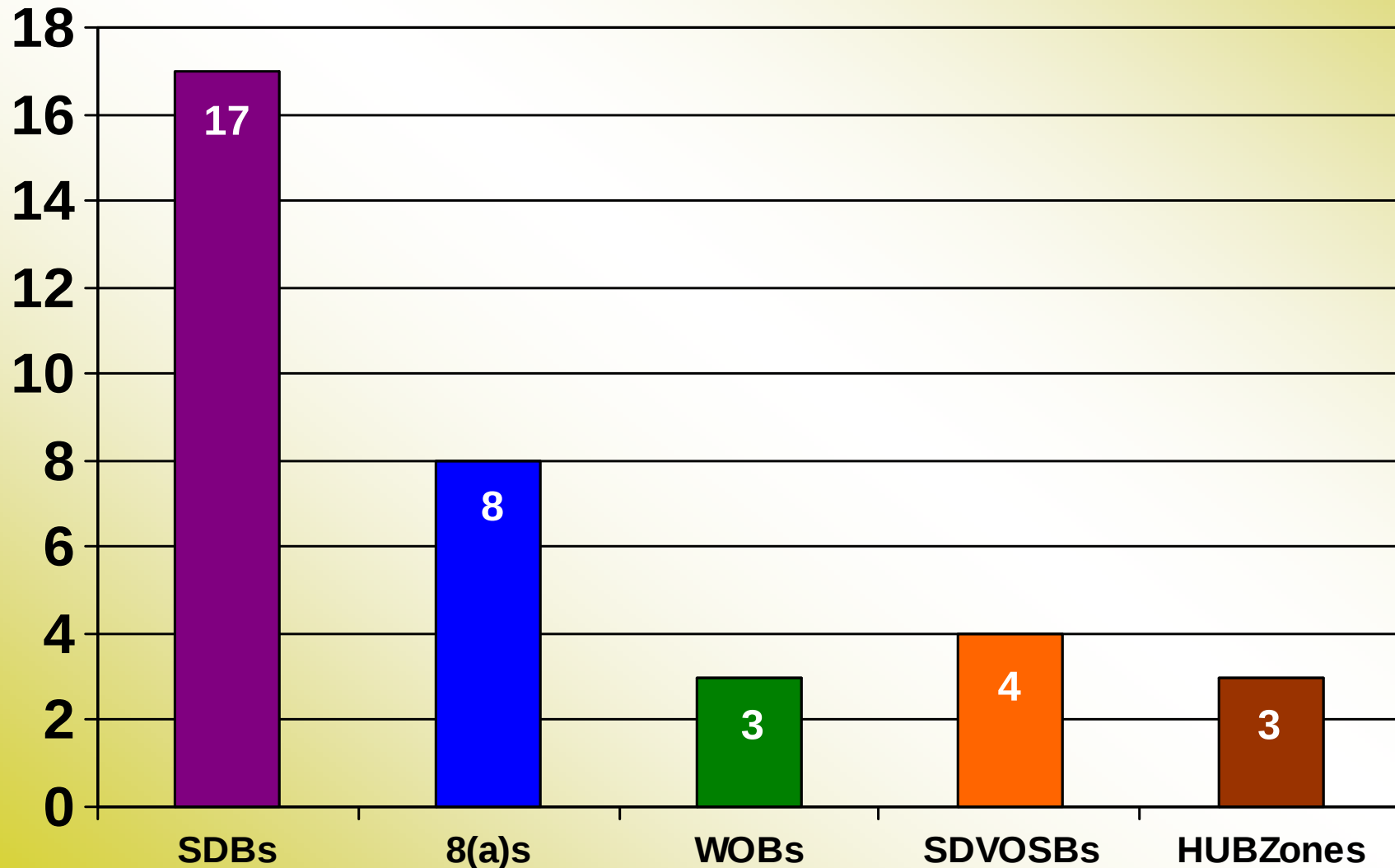


Supporting USAF Priorities

- “Modernizing and Recapitalizing our aging aircraft, spacecraft, and equipment”
 - SB provides critical spare parts needed for aging aircraft
 - SB upgrades and advances test equipment
 - MTAPP and Mentor-Protégé enhances and expands critical supplier base
 - **Eagle Tool Machine**: landing gear components
 - **Angeles Composites**: produces complex parts for F-22 and JSF



Protégé Small Business Status

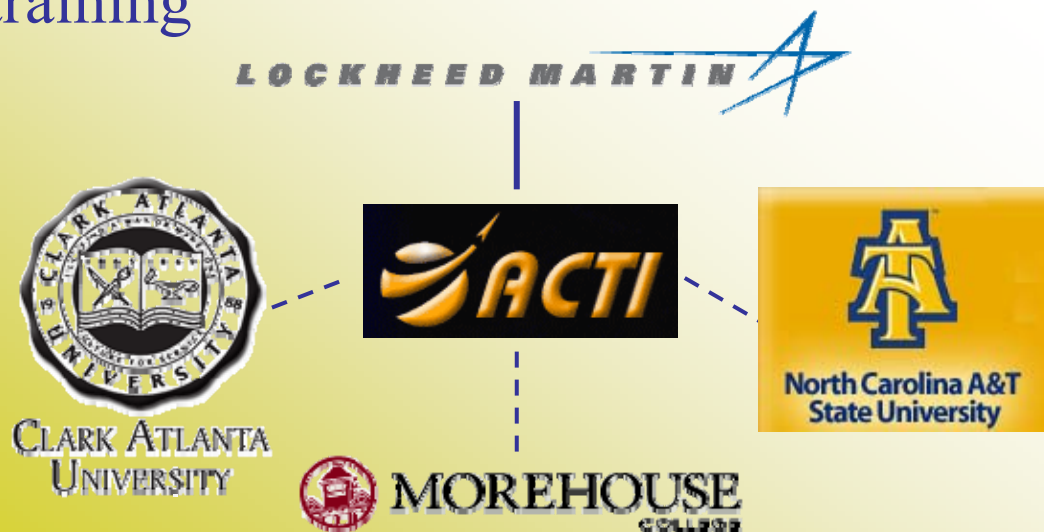




Mentor-Protégé Success Story

Lockheed Martin teamed with Angeles Composite Technologies, Inc (ACTI) to produce complex parts for
Air Force F-22 Raptor Program

Three HBCU assisted with technology transfer and training

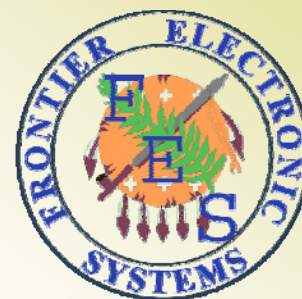




Mentor-Protégé Success Story

Frontier Electronics went from Wheat Fields to the Launch Pad. Through the recent technology transfer from Northrop Grumman in Space Flight Qualifications of Electronic parts & components, Frontier now supports the Global Hawk Joint Stars, B-1B, KC-135, C-17, F-15E, & DoD's Defense Support Program (DSP). California State University at Los Angeles supported the technology transfer.

NORTHROP GRUMMAN





Mentor-Protégé Success Story

AMEC's technology transfer in the Warfighter Training area was key to Echota's recent win of the DOE National Training Center Contract in Albuquerque NM & the Army's Human Terrain Systems (HTS) Training Contract. Echota currently has teams in Afghanistan & Iraq supporting the HTS contract. In addition, Echota has started ground breaking on it's own National Training Center in Beech Grove, TN with a scheduled completion in the summer of 07. Florida International University assisted with the Warfighter training.





Knowledge is Power!

- The information provided can help when making critical business and marketing decisions
- Learning key terminology, procurement processes, potential pitfalls, and sage advice can increase your chances for success in the federal marketplace
- Know that the Air Force has focused programs to maximize small business opportunities - Make these programs work for you!



Air Force Small Business

Air Force Meets/Exceeds Goals -
Except SDVOSB



Air Force Small Business Innovation Research (SBIR) --*Commercialization Pilot Program (CPP)*

28 November 2007

Richard Flake
Technology Transition Division
Requirements Directorate
Air Force Research Laboratory
richard.flake@wpafb.af.mil

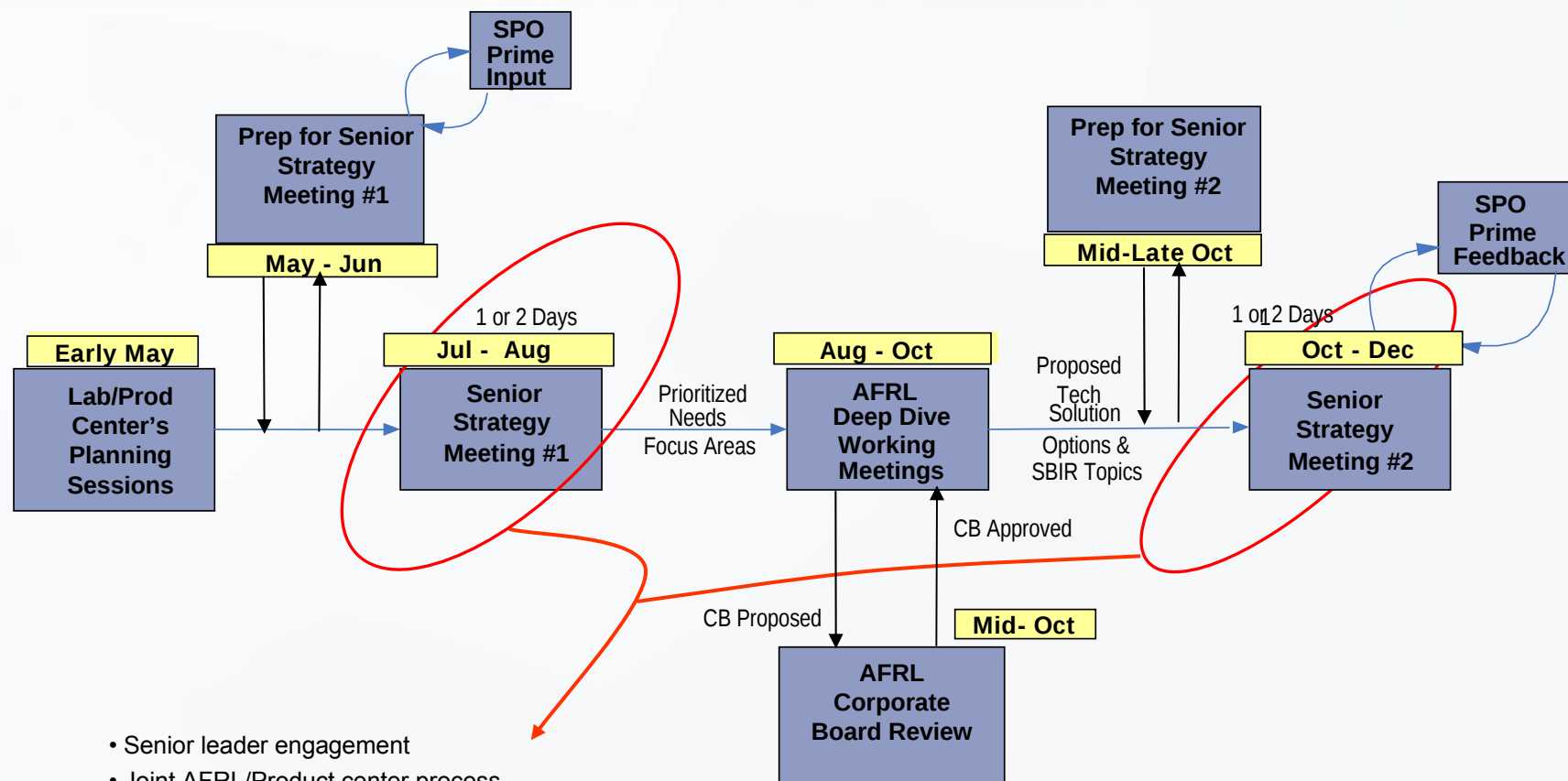


Overview

- AF Technology Needs Gathering Process
- AF Commercialization Pilot Program (CPP)
 - Strategy
 - Implementation
- SBIR Business to Business Workshop
- Future Funding Opportunities
- Workshop Rules of Engagement



Air Force Technology Needs Gathering Process

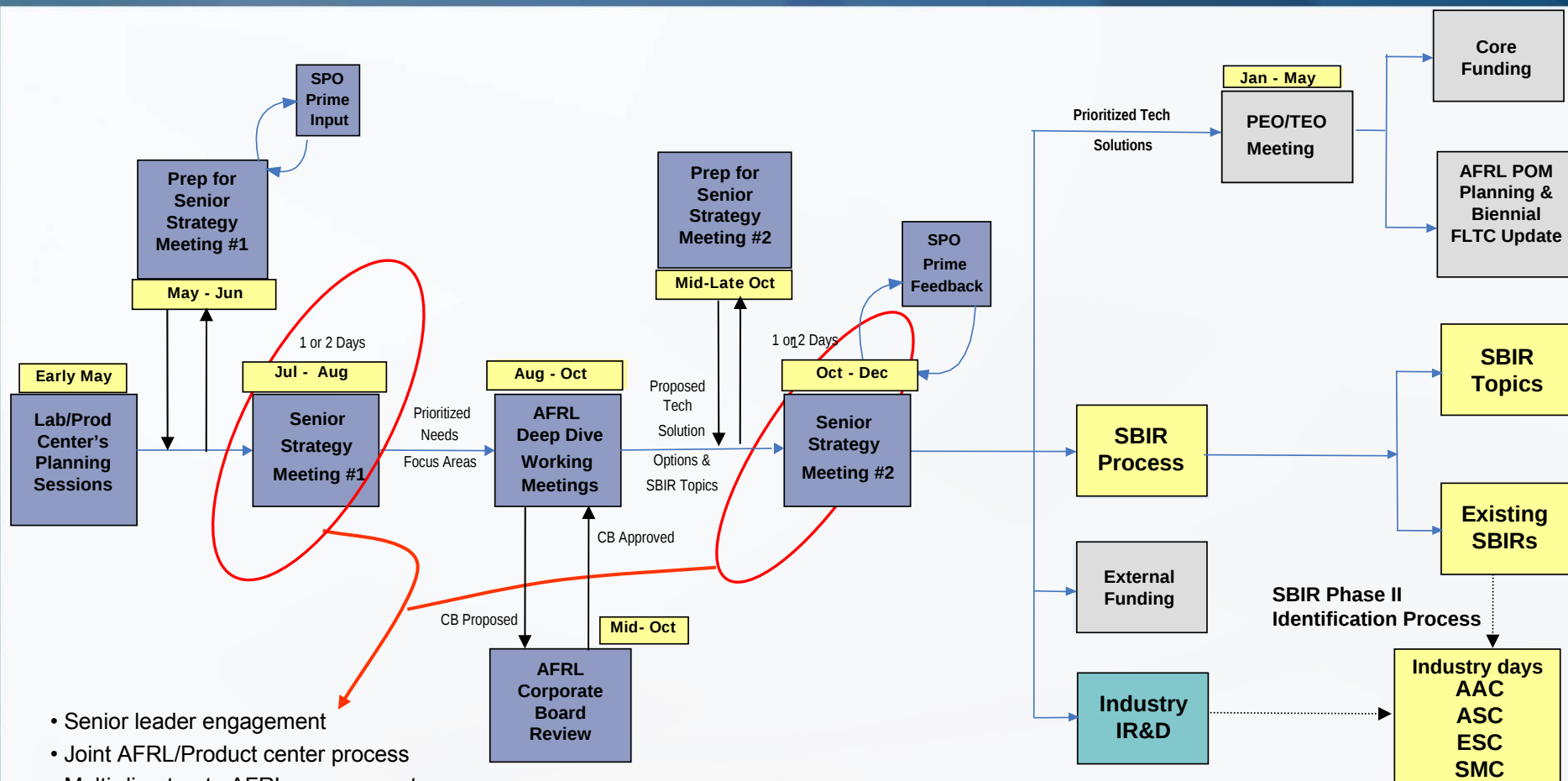


- Senior leader engagement
- Joint AFRL/Product center process
- Multi-directorate AFRL engagement
- PEO/TEO approval
- SPO Primes participation

Strategy Driven Process



Air Force Technology Based Needs Gathering Process



- Senior leader engagement
- Joint AFRL/Product center process
- Multi-directorate AFRL engagement
- PEO/TEO approval
- SPO Primes participation

Strategy Driven Process



AF Commercialization Pilot Program (CPP)

- Section 252a of National Defense Authorization Act for FY06
 - CPP
 - Focused on accelerating the transition of SBIR developed technologies, products, and services to Phase III and into the acquisition process; through the end of FY2009



AF Commercialization Pilot Program (CPP)

- Air Force Approach:
 - Needs gathering process to identify SBIR Topics tied directly to Acquisition
 - SBIR CPP Support KTRs at Product Centers (Nov 06)
 - “Transition Agents”
 - Identify SBIR Phase II efforts relevant to Acquisition Needs



AF CPP Strategy

- Utilize CPP to strengthen the impact of the SBIR Program for AF Program Executive Officer (PEO)
 - Improve connectivity among all critical AF SBIR program participants
 - PEO Organizations/Log Centers/Test Centers
 - AF Research Laboratory
 - PEO Prime Contractors and Suppliers
 - Increase SBIR Phase II technology transition opportunities



Air Force CPP Implementation

- Contracted with MacAulay-Brown Inc to provide “Transition Agents” for each product center with responsibilities to:
 - Provide a bridge between the AFRL & PEO organizations
 - Product Centers, and Program Offices Supported
 - Space and Missile Systems Center (SMC)
 - Aeronautical Systems Center (ASC)
 - Electronic Systems Center (ESC)
 - Air Armament Center (AAC)
 - F-22 & Joint Strike Fighter (JSF) Program Offices

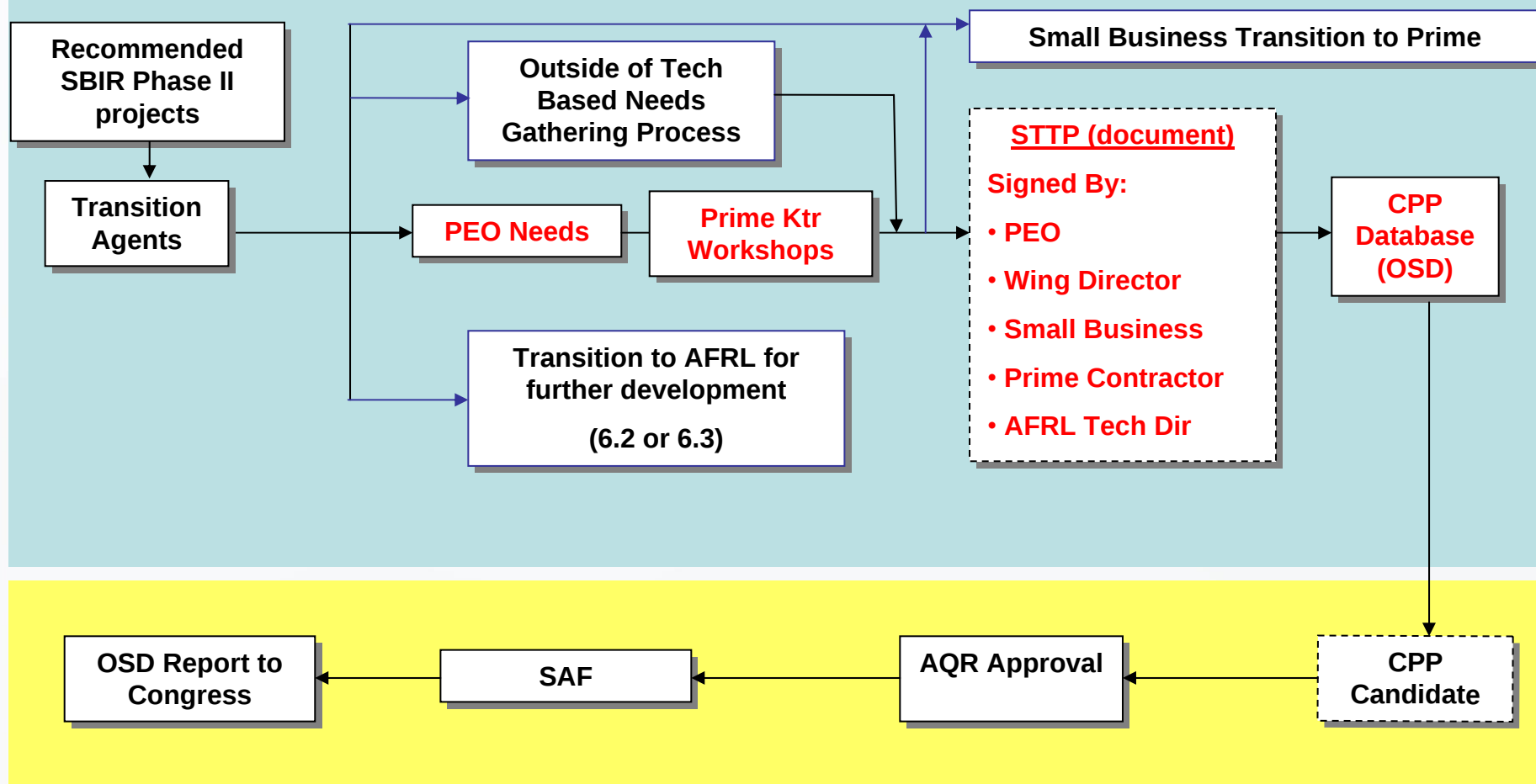


CPP Candidate Identification

- SBIR Phase II Identification Process
 - Using data mining and other techniques, identify candidate DoD SBIR Phase II projects with potential for AF CPP
 - AF Experts (Product Center & AFRL) culls SBIRs against PEO needs
 - On a case-by-case basis, SBIR recommendations by AF SBIR Technical Points of Contact (TPOC)
- Some culminate with a signed SBIR Technology Transition Plan (STTP)



AF SBIR Transition Support Process



AF SBIR CPP Manager

MacAulay-Brown Inc.



SBIR Workshops

- Air Force conducts interchange workshops between industry supply chain & small business contractors
 - SMC Industry Workshop Apr 07
 - AAC Industry Workshop Sep 07
 - JSF/F-22 Industry Workshop Nov 07
 - ESC Industry Workshop Jan 08
 - ASC Industry Workshop Mar 08
 - SMC Industry Workshop Apr 08
- Objectives of Workshops
 - Identify areas of mutual interest
 - Initiate a “Way Forward” to transition SBIR technologies

Small Businesses - By invitation only



Workshop Follow-Up Process

- Facilitators Conduct One-on-One Wrap-Up for each session
- Transition Team conducts follow-up
- Transition Team coordinates plans with AF stakeholders
 - Initiates SBIR Technology Transition Plan (STTP) as needed

Prime 1

IPT 1

STTP

IPT 2

STTP

IPT 3

STTP

Prime 2

IPT 1

STTP

IPT 2

STTP

Prime 3

IPT 1

STTP

IPT 2

STTP

IPT 3

STTP



Assistance Instruments

- SBIR
 - Enhancements
 - Extensions
- Mission funding
 - AFRL
 - PEO
- IR&D funding
- Mentor-Protégé
- Strategic Environmental Research and Development Program (SERDP)
- Etc.



Summary

- More focused direction of accelerating SBIR transition
- Gathered Prioritized AF Tech Based Needs
- Identified relevant SBIR Phase II projects
- Provided info to primes & supply chain contractors
- Invited selected small businesses for one-on-one interviews
- We want to identify areas of mutual interest between small business and supply chain contractors
 - AF SBIR CPP Transition Agents will
 - Provide follow-up
 - Coordinate all critical stakeholders
 - Initiate a STTP
 - Assist with transition acceleration



Future Funding Opportunities

28 November 2007

Andy Lagrone
Program Manager
Commercialization Pilot Program
MacAulay-Brown, Inc.
Andy.Lagrone@macb.com



Funding Opportunities Development

Goals

- Accelerate SBIR developed technologies
 - Link SBIR projects to funded Transition Programs
 - Identify transition opportunities
- Increase awareness of transition opportunities
 - Workshops
- Provide expertise and guidance

Approach

- Flow information to MacB transition agents at the Product Centers
- Produce a bi-monthly newsletter to share information and highlight potential transition (funding) opportunities
- Provide assistance as needed



Transition Funding Opportunities

- AFRL SBIR Funds
 - Extensions / Enhancements
- Mission Funds
- OSD Transition Programs
- Other Federal Government Programs
- Industry-sponsored Co-Development
- Joint Service & Agency Cross-cutting Programs
- SBA Programs
- Regional Tech-based Economic Development Programs
- Private & Institutional Investments
- Others ?



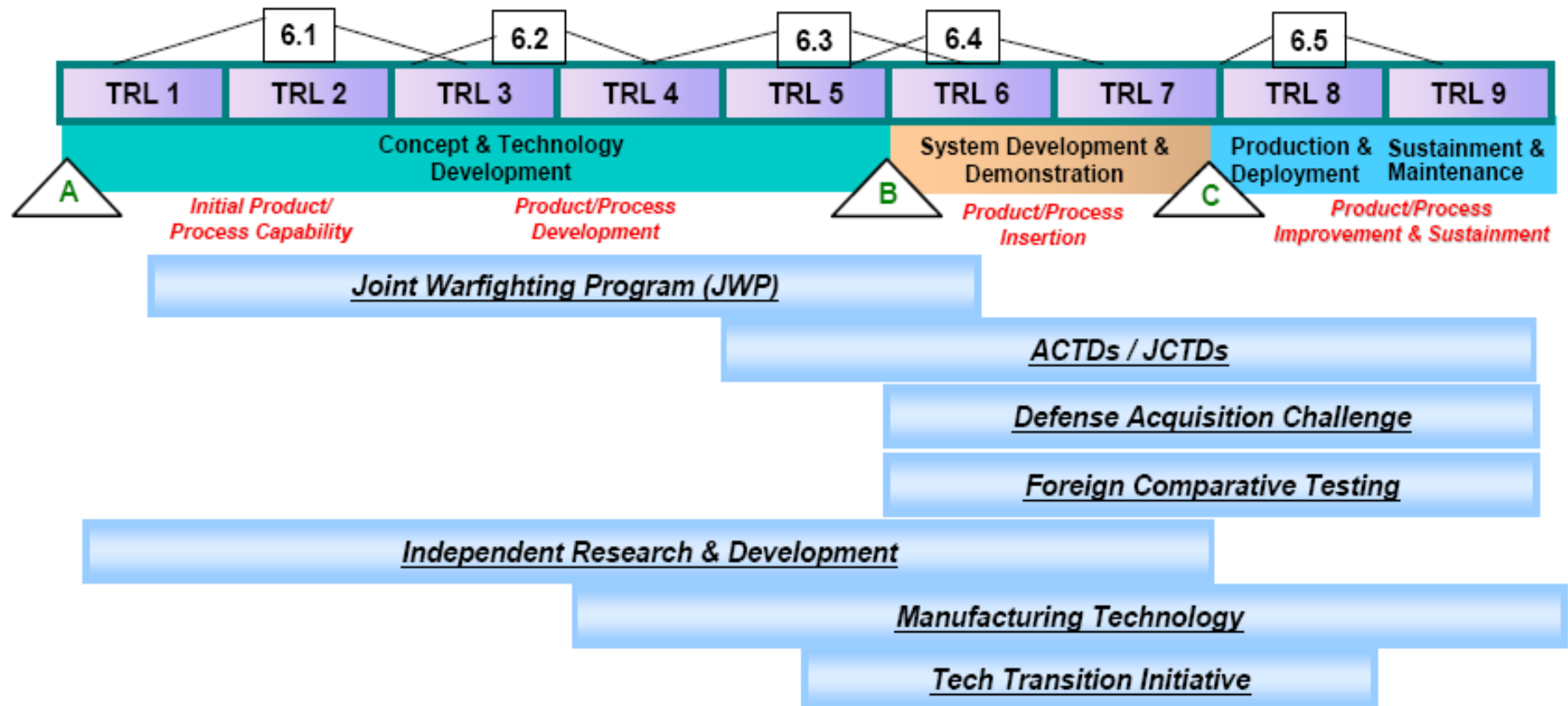
Some Key Questions

- Is there a stated need for your technology?
- Is the technology ready for transition?
- Is the SBIR company committed to transitioning the technology?
- Gap analysis -- What resources does the SBIR company need to be successful? (e.g. Technical, Business, Manufacturing)
- Can the commercialization plan realistically overcome the

transition gaps?



OSD Technology Transition Programs Mapped Against TRL



Highlights Several Transition Programs (not comprehensive)

DISCLOSURE STATEMENT: A. Approved for public release; distribution is unlimited.



Technology Transition Initiative (TTI)

- **Objective:**
 - Accelerate new technologies into operational capabilities
 - Prevents technology from
 - Obsolescence
 - Cancellation due to a lack of funding
- **Criteria:**
 - Technology developed with S&T funding
 - Product has buyer with funds available,
 - Preferably Joint or Multi-Service,
 - Project duration of less than four years
- **OPR:** Acquisition executives of each military department and Defense Agency
- Program Information and Instructions
 - <http://www.acq.osd.mil/ott/tti/>



Defense Acquisition Challenge Program

- **Objective:**

- Improve warfighter's capabilities and reduce expenditures
 - Rapidly field quality military equipment
 - Eliminate unnecessary duplication RDT&E
 - Reduce life cycle or procurement costs

- **Criteria:**

- Production-ready technologies
 - Alternatives to existing DOD programs
- TRL 6-8, Annual solicitation

- **OPR:** OSD Comparative Testing Office

- Program Information and Instructions
- <https://cto.acqcenter.com/osd/portal.nsf>



Quick Reaction Special Projects

- **Objective:**
 - Fill critical technology shortfalls in DoD acquisition programs
 - Technology critically needed by the combatant commanders
- **Criteria:**
 - Focused on responding to emergent needs during the execution years
 - Takes advantage of breakthroughs in rapidly evolving technologies
 - Defined deliverable in less than 12 months
 - TRL 7-9, Annual solicitation
- **OPR:** Director of Defense Research & Engineering (DDR&E)
 - Program Information and Instructions



Advanced Concept / Joint Capabilities Technology Demonstrations (AC/JCTD)

- **Objective:**

- To place mature technologies in the hands of the user
- Conduct realistic and extensive military exercises
- Allows user to evaluate utility and gain experience with the capability

- **Criteria:**

- Mature or nearly mature technologies
 - Avoids the time and risks associated with technology development
- TRL 6-8, Annual solicitation

- **OPR:** Deputy Under Secretary of Defense for Advanced Systems and Concepts (DUSD(AS&C))

- Program Information and Instructions

<http://www.acq.osd.mil/jctd/intro.htm>



Strategic Environmental Research and Development Program (SERDP)

- **Objective:**
 - Development and application of environmental technologies
 - Reduce costs, risks, and/or time required to resolve environmental problems
 - Enhance safety and health
- **Criteria:**
 - Address the high-priority environmental needs of DoD and DoE
 - Annual solicitation
- **OPR:** SERDP Program Office
 - Program Information and Instructions
<http://www.serdp.org/>



Other Funding Programs

Ohio Third Frontier Initiative (\$2B, 10 Year Plan)

Ohio Research Commercialization Grant Program (\$2M)

- **Objective:**

- Improve ability of small companies to assess/realize the commercial potential of research projects
- Promote the competitiveness of small companies

- **Criteria:**

- Ohio business and must have completed a recent Phase II SBIR

- **OPR:** Ohio Department of Development

- Program Information and Instructions

http://www.ohiochannel.org/your_state



Summary

- Transitioning SBIR technology requires actively pursuing funding and transition program to fill business/transition gaps
- Linking transition candidates to funding opportunities is key to success
- There are many transition programs outside of the SBIR program



SBIR CPP Workshop Rules of Engagement (ROE)

28 November 2007

Andy Lagrone
SBIR Transition Support
Program Manager
MacAulay-Brown, Inc.
Andy.Lagrone@macb.com



Rules of Engagement (ROE) for One-on-One Sessions

- One-on-One Sessions begin at 0800 tomorrow
 - Prime contractors –
 - Schedule and location of your room are in your welcome packet
 - Small Businesses –
 - Schedule and location of your sessions are on the back of nametag
 - There is a facilitator assigned to each room
 - Rooms are located on second floor
- Prime contractors meet facilitator a minimum of five minutes prior to **first session at the room**
- Small businesses should be outside the room five minutes prior to start of the session
 - The facilitator will bring you into the room when everyone is ready



ROE

- Each session is scheduled for 30 minutes
 - 25 minute discussion
 - prime contractor & small business
 - 5 minutes for administrative purposes
 - prime contractor and facilitator
- Suggestions
 - Give business card to prime contractor and facilitator
 - Discuss the SBIR project that got you invited by the prime contractor
 - Prime contractor may ask about other technologies
- Prime contractors and small businesses are requested to complete a survey when finished with your one-on-one sessions



Additional Items of Interest

- Poster Session
 - Ballroom C
 - Staffed
 - during the Networking Reception &
 - 0800 - 1500 tomorrow
 - Thanks to poster session participants
- Lockheed Martin Aeronautics Company Sponsoring Networking Reception – Thank You
- Tomorrow
 - Breakfast 0730 - 0900
 - Lunch 1130 - 1300
 - Snacks Available during afternoon break



Prime Contractor Interviewers

All prime & supply chain contractor interviewers Please come to the front of the room now to meet your facilitator for tomorrow's sessions